THE RANCH PLAN PLANNED COMMUNITY

PLANNING AREAS 3 AND 4 RUNOFF MANAGEMENT PLAN

Michael Baker INTERNATIONAL

TECHNICAL APPENDIX D.1

Rational Method Expected Value (2-, 5-, 10-, 25-, 50- and 100-year)

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******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                          Analysis prepared by:




------------------------------------------------------------------------------
  FILE NAME: S1.DAT
  TIME/DATE OF STUDY: 10:39 04/01/2013
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.159
   2)   10.00;  1.439
   3)   15.00;  1.061
   4)   20.00;  0.841
   5)   25.00;  0.710
   6)   30.00;  0.627
   7)   40.00;  0.543
   8)   50.00;  0.487
   9)   60.00;  0.458
  10)   90.00;  0.402
  11)  120.00;  0.359
  12)  180.00;  0.308
  13)  360.00;  0.239
  14) 1440.00;  0.109
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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******************************************************************************
  FLOW PROCESS FROM NODE  10100.00 TO NODE  10101.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   934.06
  ELEVATION DATA: UPSTREAM(FEET) =   3351.52  DOWNSTREAM(FEET) =   3172.56

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.054
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        3.55      0.60     1.000     0   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.45
  TOTAL AREA(ACRES) =      3.55   PEAK FLOW RATE(CFS) =      1.45

******************************************************************************
  FLOW PROCESS FROM NODE  10101.00 TO NODE  10102.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3172.56  DOWNSTREAM(FEET) =   3090.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   942.40   CHANNEL SLOPE =  0.0870
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.842
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       19.22      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.25
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   4.83
  Tc(MIN.) =   19.98
  SUBAREA AREA(ACRES) =    19.22       SUBAREA RUNOFF(CFS) =    4.18
  EFFECTIVE AREA(ACRES) =     22.77     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.8         PEAK FLOW RATE(CFS) =       4.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   3.48
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10102.00 =    1876.46 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  10102.00 TO NODE  10103.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   3090.55  DOWNSTREAM(FEET) =   3022.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   920.65   CHANNEL SLOPE =  0.0740
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.725
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.45
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   4.45
  Tc(MIN.) =   24.43
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =    2.42
  EFFECTIVE AREA(ACRES) =     44.29     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       44.3         PEAK FLOW RATE(CFS) =       4.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   3.27
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10103.00 =    2797.11 FEET.

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  FLOW PROCESS FROM NODE  10103.00 TO NODE  10104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3022.44  DOWNSTREAM(FEET) =   2962.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.87   CHANNEL SLOPE =  0.0612
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.639
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      126.78      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.38
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   4.82
  Tc(MIN.) =   29.25
  SUBAREA AREA(ACRES) =   126.78       SUBAREA RUNOFF(CFS) =    4.52
  EFFECTIVE AREA(ACRES) =    171.07     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.1         PEAK FLOW RATE(CFS) =       6.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   3.21
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10104.00 =    3774.98 FEET.

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  FLOW PROCESS FROM NODE  10104.00 TO NODE  10105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
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  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.57  DOWNSTREAM(FEET) =   2917.85
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.94   CHANNEL SLOPE =  0.0240
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.526
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.68      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.26
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =  13.77
  Tc(MIN.) =   43.02
  SUBAREA AREA(ACRES) =   112.68       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    283.75     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      283.8         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   2.26
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.00 =    5639.92 FEET.

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  FLOW PROCESS FROM NODE  10105.00 TO NODE  10105.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2917.85  DOWNSTREAM(FEET) =   2880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1406.97   CHANNEL SLOPE =  0.0269
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.478
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      183.39      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.36
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   9.93
  Tc(MIN.) =   52.95
  SUBAREA AREA(ACRES) =   183.39       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    467.14     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
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  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      467.1         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   2.36
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.50 =    7046.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.50 TO NODE  10106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2880.00  DOWNSTREAM(FEET) =   2868.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1701.11   CHANNEL SLOPE =  0.0070
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.434
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.63      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.42
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =  19.92
  Tc(MIN.) =   72.87
  SUBAREA AREA(ACRES) =    60.63       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    527.77     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      527.8         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   1.42
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10106.00 =    8748.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10106.00 TO NODE  10107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2868.10  DOWNSTREAM(FEET) =   2781.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2951.00   CHANNEL SLOPE =  0.0294
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.398
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.11      0.60     1.000     -
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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.44
  AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =  20.15
  Tc(MIN.) =   93.02
  SUBAREA AREA(ACRES) =   123.11       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    650.88     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      650.9         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   2.44
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10107.00 =   11699.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10107.00 TO NODE  10108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2781.28  DOWNSTREAM(FEET) =   2725.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2630.56   CHANNEL SLOPE =  0.0213
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.368
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      186.62      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.15
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =  20.37
  Tc(MIN.) =  113.39
  SUBAREA AREA(ACRES) =   186.62       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    837.50     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      837.5         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   2.15
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10108.00 =   14329.56 FEET.

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  FLOW PROCESS FROM NODE  10108.00 TO NODE  10109.00 IS CODE =  51
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2725.20  DOWNSTREAM(FEET) =   2581.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2890.52   CHANNEL SLOPE =  0.0496
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.351
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.07      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.96
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =  16.28
  Tc(MIN.) =  129.67
  SUBAREA AREA(ACRES) =   112.07       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    949.57     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      949.6         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   2.96
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10109.00 =   17220.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10109.00 TO NODE  10110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.72  DOWNSTREAM(FEET) =   2367.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2877.15   CHANNEL SLOPE =  0.0744
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.339
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.21      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.45
  AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =  13.90
  Tc(MIN.) =  143.57
  SUBAREA AREA(ACRES) =   145.21       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1094.78     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
```



```
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1094.8         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =   3.45
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10110.00 =   20097.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10110.00 TO NODE  10111.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2367.59  DOWNSTREAM(FEET) =   2075.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2802.04   CHANNEL SLOPE =  0.1041
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.329
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.01      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.90
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =  11.97
  Tc(MIN.) =  155.54
  SUBAREA AREA(ACRES) =   339.01       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1433.79     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1433.8         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.72   FLOW VELOCITY(FEET/SEC.) =   3.90
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10111.00 =   22899.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10111.00 TO NODE  10112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2075.82  DOWNSTREAM(FEET) =   2004.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3782.59   CHANNEL SLOPE =  0.0190
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.306
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -      265.32      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.05
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =  30.69
  Tc(MIN.) =  186.23
  SUBAREA AREA(ACRES) =   265.32       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1699.11     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1699.1         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =   2.05
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.00 =   26681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10112.00 TO NODE  10112.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.03  DOWNSTREAM(FEET) =   1982.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1479.53   CHANNEL SLOPE =  0.0149
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.301
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      307.63      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.88
  AVERAGE FLOW DEPTH(FEET) =   1.04   TRAVEL TIME(MIN.) =  13.13
  Tc(MIN.) =  199.36
  SUBAREA AREA(ACRES) =   307.63       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2006.74     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2006.7         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =   1.88
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.50 =   28161.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  51
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1982.04  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3416.13   CHANNEL SLOPE =  0.0165
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.289
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.40      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.96
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =  29.11
  Tc(MIN.) =  228.47
  SUBAREA AREA(ACRES) =   127.40       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2134.14     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2134.1         PEAK FLOW RATE(CFS) =       6.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.02   FLOW VELOCITY(FEET/SEC.) =   1.96
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     2134.1  TC(MIN.) =    228.47
  EFFECTIVE AREA(ACRES) =   2134.14  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =       6.10
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S2.DAT
  TIME/DATE OF STUDY: 10:39 04/01/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.164
   2)   10.00;  1.443
   3)   15.00;  1.063
   4)   20.00;  0.843
   5)   25.00;  0.711
   6)   30.00;  0.628
   7)   40.00;  0.544
   8)   50.00;  0.488
   9)   60.00;  0.459
  10)   90.00;  0.402
  11)  120.00;  0.360
  12)  180.00;  0.309
  13)  360.00;  0.240
  14) 1440.00;  0.109
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  10200.00 TO NODE  10201.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   301.66
  ELEVATION DATA: UPSTREAM(FEET) =   3087.44  DOWNSTREAM(FEET) =   3031.53

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.485
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.09      0.60     1.000     0    9.71
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.87
  TOTAL AREA(ACRES) =      1.09   PEAK FLOW RATE(CFS) =      0.87

 ************************************************************************
  FLOW PROCESS FROM NODE  10201.00 TO NODE  10202.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3031.53  DOWNSTREAM(FEET) =   2903.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   538.03   CHANNEL SLOPE =  0.2382
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.301
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.06      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.14
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   11.87
  SUBAREA AREA(ACRES) =     4.06       SUBAREA RUNOFF(CFS) =    2.56
  EFFECTIVE AREA(ACRES) =      5.15     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2         PEAK FLOW RATE(CFS) =       3.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   4.60
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10202.00 =     839.69 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  10202.00 TO NODE  10203.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   2903.38  DOWNSTREAM(FEET) =   2639.65
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1124.98   CHANNEL SLOPE =  0.2344
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.070
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       36.13      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.15
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.18
 AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   3.03
 Tc(MIN.) =   14.90
 SUBAREA AREA(ACRES) =    36.13       SUBAREA RUNOFF(CFS) =   15.30
 EFFECTIVE AREA(ACRES) =     41.28     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       41.3         PEAK FLOW RATE(CFS) =      17.48

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.92   FLOW VELOCITY(FEET/SEC.) =   6.91
 LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10203.00 =    1964.67 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10203.00 TO NODE  10204.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2639.65  DOWNSTREAM(FEET) =   2444.90
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.75   CHANNEL SLOPE =  0.1026
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.825
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       56.14      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.37
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.46
 AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   5.80
 Tc(MIN.) =   20.70
 SUBAREA AREA(ACRES) =    56.14       SUBAREA RUNOFF(CFS) =   11.35
 EFFECTIVE AREA(ACRES) =     97.42     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =      19.70

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   5.19
 LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10204.00 =    3862.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10204.00 TO NODE  10205.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2444.90  DOWNSTREAM(FEET) =   2245.64
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1973.02   CHANNEL SLOPE =  0.1010
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.688
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      264.47      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.81
 AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   5.66
 Tc(MIN.) =   26.36
 SUBAREA AREA(ACRES) =   264.47       SUBAREA RUNOFF(CFS) =   21.08
 EFFECTIVE AREA(ACRES) =    361.89     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      361.9         PEAK FLOW RATE(CFS) =      28.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =   5.69
 LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10205.00 =    5835.44 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10205.00 TO NODE  10206.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2245.64  DOWNSTREAM(FEET) =   2157.91
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1870.92   CHANNEL SLOPE =  0.0469
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.597
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      255.55      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.04
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.27
 AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   7.30
 Tc(MIN.) =   33.66
 SUBAREA AREA(ACRES) =   255.55       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    617.44     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      617.4         PEAK FLOW RATE(CFS) =      28.84
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =   4.27
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.00 =    7706.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.00 TO NODE  10206.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2157.91  DOWNSTREAM(FEET) =   2119.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1453.59   CHANNEL SLOPE =  0.0266
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.540
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.47      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.46
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   7.01
  Tc(MIN.) =   40.68
  SUBAREA AREA(ACRES) =   141.47       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    758.91     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      758.9         PEAK FLOW RATE(CFS) =      28.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.67   FLOW VELOCITY(FEET/SEC.) =   3.46
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.50 =    9159.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2119.30  DOWNSTREAM(FEET) =   2093.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2020.48   CHANNEL SLOPE =  0.0129
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.478
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.39      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.84
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.63
  AVERAGE FLOW DEPTH(FEET) =   1.91   TRAVEL TIME(MIN.) =  12.78
  Tc(MIN.) =   53.46
  SUBAREA AREA(ACRES) =   105.39       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    864.30     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      864.3         PEAK FLOW RATE(CFS) =      28.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.91   FLOW VELOCITY(FEET/SEC.) =   2.63
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10220.00 =   11180.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   53.46
  RAINFALL INTENSITY(INCH/HR) =   0.48
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     864.30
  TOTAL STREAM AREA(ACRES) =     864.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      28.84

****************************************************************************
  FLOW PROCESS FROM NODE  10210.00 TO NODE  10211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   890.82
  ELEVATION DATA: UPSTREAM(FEET) =   2966.08  DOWNSTREAM(FEET) =   2867.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.601
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.993
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        7.25      0.60     1.000     0   16.60
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.56
  TOTAL AREA(ACRES) =      7.25   PEAK FLOW RATE(CFS) =      2.56

****************************************************************************
  FLOW PROCESS FROM NODE  10211.00 TO NODE  10212.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2867.74  DOWNSTREAM(FEET) =   2763.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1682.06   CHANNEL SLOPE =  0.0618
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.693
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       33.02      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.96
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   9.46
  Tc(MIN.) =   26.06
  SUBAREA AREA(ACRES) =    33.02       SUBAREA RUNOFF(CFS) =    2.78
  EFFECTIVE AREA(ACRES) =     40.27     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.3         PEAK FLOW RATE(CFS) =       3.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   2.78
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10212.00 =    2572.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10212.00 TO NODE  10213.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2763.75  DOWNSTREAM(FEET) =   2662.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1206.59   CHANNEL SLOPE =  0.0842
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.609
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       71.89      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.25
  AVERAGE FLOW DEPTH(FEET) =   0.63   TRAVEL TIME(MIN.) =   6.19
  Tc(MIN.) =   32.25
  SUBAREA AREA(ACRES) =    71.89       SUBAREA RUNOFF(CFS) =    0.60
  EFFECTIVE AREA(ACRES) =    112.16     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      112.2         PEAK FLOW RATE(CFS) =       3.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   3.14
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10213.00 =    3779.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10213.00 TO NODE  10214.00 IS CODE =  51
```



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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2662.20  DOWNSTREAM(FEET) =   2520.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1783.17   CHANNEL SLOPE =  0.0793
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.533
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      182.61      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.06
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   9.71
  Tc(MIN.) =   41.96
  SUBAREA AREA(ACRES) =   182.61       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    294.77     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      294.8         PEAK FLOW RATE(CFS) =       3.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   3.06
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10214.00 =    5562.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10214.00 TO NODE  10215.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2520.73  DOWNSTREAM(FEET) =   2270.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2774.20   CHANNEL SLOPE =  0.0901
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.470
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      156.94      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.22
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =  14.35
  Tc(MIN.) =   56.31
  SUBAREA AREA(ACRES) =   156.94       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    451.71     AREA-AVERAGED Fm(INCH/HR) =   0.60
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  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      451.7         PEAK FLOW RATE(CFS) =       3.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   3.22
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10215.00 =    8336.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10215.00 TO NODE  10216.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2270.71  DOWNSTREAM(FEET) =   2151.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.75   CHANNEL SLOPE =  0.0592
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.443
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      130.62      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.73
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =  12.35
  Tc(MIN.) =   68.66
  SUBAREA AREA(ACRES) =   130.62       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    582.33     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      582.3         PEAK FLOW RATE(CFS) =       3.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   2.73
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.00 =   10356.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.00 TO NODE  10216.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2151.20  DOWNSTREAM(FEET) =   2120.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1242.42   CHANNEL SLOPE =  0.0246
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.423
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.25      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.97
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =  10.53
  Tc(MIN.) =   79.19
  SUBAREA AREA(ACRES) =    51.25       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    633.58     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      633.6         PEAK FLOW RATE(CFS) =       3.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   1.97
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.50 =   11599.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2120.63  DOWNSTREAM(FEET) =   2093.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1301.06   CHANNEL SLOPE =  0.0210
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.401
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.16      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.85
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =  11.71
  Tc(MIN.) =   90.90
  SUBAREA AREA(ACRES) =    26.16       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    659.74     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      659.7         PEAK FLOW RATE(CFS) =       3.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   1.85
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   90.90
 RAINFALL INTENSITY(INCH/HR) =   0.40
 AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     659.74
 TOTAL STREAM AREA(ACRES) =     659.74
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.39

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       28.84   53.46    0.478  0.60( 0.60) 1.00     864.3   10200.00
     2        3.39   90.90    0.401  0.60( 0.60) 1.00     659.7   10210.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       31.22   53.46    0.478  0.60( 0.60) 1.00    1252.3   10200.00
     2       27.57   90.90    0.401  0.60( 0.60) 1.00    1524.0   10210.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      31.22    Tc(MIN.) =    53.46
 EFFECTIVE AREA(ACRES) =    1252.29   AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1524.0
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10220.00 TO NODE  10221.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2093.25  DOWNSTREAM(FEET) =   1965.76
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2966.11   CHANNEL SLOPE =  0.0430
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.449
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      104.45      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.22
```



```
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.23
 AVERAGE FLOW DEPTH(FEET) =   1.57   TRAVEL TIME(MIN.) =  11.69
 Tc(MIN.) =   65.15
 SUBAREA AREA(ACRES) =   104.45       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   1356.74     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1628.5         PEAK FLOW RATE(CFS) =      31.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.57   FLOW VELOCITY(FEET/SEC.) =   4.23
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.00 =   15866.18 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10221.00 TO NODE  10221.50 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1965.76  DOWNSTREAM(FEET) =   1950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1346.48   CHANNEL SLOPE =  0.0117
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.433
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      169.50      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.22
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.59
 AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   8.66
 Tc(MIN.) =   73.81
 SUBAREA AREA(ACRES) =   169.50       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   1526.24     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1798.0         PEAK FLOW RATE(CFS) =      31.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.00   FLOW VELOCITY(FEET/SEC.) =   2.59
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.50 =   17212.66 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1950.00  DOWNSTREAM(FEET) =   1925.82
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1849.80   CHANNEL SLOPE =  0.0131
```

```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.411
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.12      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.70
  AVERAGE FLOW DEPTH(FEET) =   1.96   TRAVEL TIME(MIN.) =  11.42
  Tc(MIN.) =   85.23
  SUBAREA AREA(ACRES) =    43.12       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1569.36     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1841.1         PEAK FLOW RATE(CFS) =      31.22
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =   2.70
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1841.1  TC(MIN.) =     85.23
  EFFECTIVE AREA(ACRES) =   1569.36  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      31.22

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       31.22   85.23    0.411  0.60( 0.60) 1.00    1569.4   10200.00
      2       27.57  123.69    0.357  0.60( 0.60) 1.00    1841.1   10210.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S3.DAT
  TIME/DATE OF STUDY: 10:39 04/01/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.168
   2)   10.00;  1.446
   3)   15.00;  1.065
   4)   20.00;  0.844
   5)   25.00;  0.712
   6)   30.00;  0.628
   7)   40.00;  0.544
   8)   50.00;  0.488
   9)   60.00;  0.460
  10)   90.00;  0.403
  11)  120.00;  0.361
  12)  180.00;  0.310
  13)  360.00;  0.241
  14) 1440.00;  0.110
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  10300.00 TO NODE  10301.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.52
  ELEVATION DATA: UPSTREAM(FEET) =   4227.21  DOWNSTREAM(FEET) =   4064.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.977
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.738
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.00      0.60     1.000     0    7.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.02
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      1.02

 ************************************************************************
  FLOW PROCESS FROM NODE  10301.00 TO NODE  10302.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4064.64  DOWNSTREAM(FEET) =   3797.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =   631.34   CHANNEL SLOPE =  0.4235
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.471
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        6.23      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.70
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   1.85
  Tc(MIN.) =    9.82
  SUBAREA AREA(ACRES) =     6.23       SUBAREA RUNOFF(CFS) =    4.89
  EFFECTIVE AREA(ACRES) =      7.23     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2         PEAK FLOW RATE(CFS) =       5.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   6.51
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10302.00 =     941.86 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  10302.00 TO NODE  10303.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   3797.25  DOWNSTREAM(FEET) =   3447.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1908.89   CHANNEL SLOPE =  0.1834
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.051
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       32.83      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.79
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.80
 AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   5.49
 Tc(MIN.) =   15.31
 SUBAREA AREA(ACRES) =    32.83       SUBAREA RUNOFF(CFS) =   13.34
 EFFECTIVE AREA(ACRES) =     40.06     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =      16.28

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.94   FLOW VELOCITY(FEET/SEC.) =   6.20
 LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10303.00 =    2850.75 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10303.00 TO NODE  10304.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3447.07  DOWNSTREAM(FEET) =   3228.48
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.05   CHANNEL SLOPE =  0.1140
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.817
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       60.51      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.44
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.61
 AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   5.70
 Tc(MIN.) =   21.01
 SUBAREA AREA(ACRES) =    60.51       SUBAREA RUNOFF(CFS) =   11.84
 EFFECTIVE AREA(ACRES) =    100.57     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      100.6         PEAK FLOW RATE(CFS) =      19.69

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   5.41
 LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10304.00 =    4768.80 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10304.00 TO NODE  10305.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3228.48  DOWNSTREAM(FEET) =   3118.37
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1679.40   CHANNEL SLOPE =  0.0656
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.678
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      116.56      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.63
 AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   6.04
 Tc(MIN.) =   27.05
 SUBAREA AREA(ACRES) =   116.56       SUBAREA RUNOFF(CFS) =    8.15
 EFFECTIVE AREA(ACRES) =    217.13     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      217.1         PEAK FLOW RATE(CFS) =      19.69
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   4.42
 LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10305.00 =    6448.20 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10305.00 TO NODE  10306.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3118.37  DOWNSTREAM(FEET) =   2807.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2853.67   CHANNEL SLOPE =  0.1088
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.578
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      189.23      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.68
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.33
 AVERAGE FLOW DEPTH(FEET) =   1.11   TRAVEL TIME(MIN.) =   8.92
 Tc(MIN.) =   35.97
 SUBAREA AREA(ACRES) =   189.23       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    406.36     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      406.4         PEAK FLOW RATE(CFS) =      19.69
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.11   FLOW VELOCITY(FEET/SEC.) =   5.33
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10306.00 =    9301.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10306.00 TO NODE  10307.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2807.99  DOWNSTREAM(FEET) =   2591.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2848.03   CHANNEL SLOPE =  0.0759
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.509
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      416.51      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.65
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =  10.20
  Tc(MIN.) =   46.17
  SUBAREA AREA(ACRES) =   416.51       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    822.87     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      822.9         PEAK FLOW RATE(CFS) =      19.69
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   4.65
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10307.00 =   12149.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10307.00 TO NODE  10308.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2591.87  DOWNSTREAM(FEET) =   2516.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.06   CHANNEL SLOPE =  0.0263
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.458
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.49      0.60     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.16
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =  15.11
  Tc(MIN.) =   61.28
  SUBAREA AREA(ACRES) =   320.49       SUBAREA RUNOFF(CFS) =    1.85
  EFFECTIVE AREA(ACRES) =   1143.36     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1143.4         PEAK FLOW RATE(CFS) =      19.69
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =   3.14
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.00 =   15011.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.00 TO NODE  10308.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2516.62  DOWNSTREAM(FEET) =   2462.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.32   CHANNEL SLOPE =  0.0288
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.439
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.88      0.60     0.966     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.966
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.28
  AVERAGE FLOW DEPTH(FEET) =   1.46   TRAVEL TIME(MIN.) =   9.60
  Tc(MIN.) =   70.88
  SUBAREA AREA(ACRES) =   191.88       SUBAREA RUNOFF(CFS) =    2.58
  EFFECTIVE AREA(ACRES) =   1335.24     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1335.2         PEAK FLOW RATE(CFS) =      19.69
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =   3.24
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.50 =   16901.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.50 TO NODE  10309.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.25  DOWNSTREAM(FEET) =   2409.87
```

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  CHANNEL LENGTH THRU SUBAREA(FEET) =  1874.33   CHANNEL SLOPE =  0.0279
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.421
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.14      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.20
  AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   9.76
  Tc(MIN.) =   80.64
  SUBAREA AREA(ACRES) =    90.14       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1425.38     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1425.4         PEAK FLOW RATE(CFS) =      19.69
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOW VELOCITY(FEET/SEC.) =   3.20
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10309.00 =   18775.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2409.87  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2576.20   CHANNEL SLOPE =  0.0310
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.398
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.83      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.32
  AVERAGE FLOW DEPTH(FEET) =   1.41   TRAVEL TIME(MIN.) =  12.95
  Tc(MIN.) =   93.58
  SUBAREA AREA(ACRES) =    83.83       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1509.21     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1509.2         PEAK FLOW RATE(CFS) =      19.69
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```



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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =   3.32
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   93.58
  RAINFALL INTENSITY(INCH/HR) =   0.40
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =    1509.21
  TOTAL STREAM AREA(ACRES) =    1509.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.69

****************************************************************************
  FLOW PROCESS FROM NODE  10320.00 TO NODE  10321.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.56
  ELEVATION DATA: UPSTREAM(FEET) =   3374.80  DOWNSTREAM(FEET) =   3300.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.959
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.596
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.24      0.60     1.000     0    8.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.01
  TOTAL AREA(ACRES) =      2.24   PEAK FLOW RATE(CFS) =      2.01

****************************************************************************
  FLOW PROCESS FROM NODE  10321.00 TO NODE  10322.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3300.24  DOWNSTREAM(FEET) =   3187.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   581.07   CHANNEL SLOPE =  0.1945
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.358
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.01      0.60     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.40
  AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =   11.16
  SUBAREA AREA(ACRES) =     5.01       SUBAREA RUNOFF(CFS) =    3.42
  EFFECTIVE AREA(ACRES) =      7.25     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2         PEAK FLOW RATE(CFS) =       4.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   4.70
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10322.00 =     871.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10322.00 TO NODE  10323.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3187.21  DOWNSTREAM(FEET) =   3108.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.98   CHANNEL SLOPE =  0.0801
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.062
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.37      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.17
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   3.91
  Tc(MIN.) =   15.07
  SUBAREA AREA(ACRES) =    30.37       SUBAREA RUNOFF(CFS) =   12.63
  EFFECTIVE AREA(ACRES) =     37.62     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =      15.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   4.48
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10323.00 =    1849.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10323.00 TO NODE  10324.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3108.86  DOWNSTREAM(FEET) =   2923.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.11   CHANNEL SLOPE =  0.0966
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.814
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.88      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.28
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   6.08
  Tc(MIN.) =   21.15
  SUBAREA AREA(ACRES) =    68.88       SUBAREA RUNOFF(CFS) =   13.26
  EFFECTIVE AREA(ACRES) =    106.50     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.5         PEAK FLOW RATE(CFS) =      20.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =   5.12
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10324.00 =    3773.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10324.00 TO NODE  10325.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2923.03  DOWNSTREAM(FEET) =   2675.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2788.58   CHANNEL SLOPE =  0.0889
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.626
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      146.19      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.14
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   9.04
  Tc(MIN.) =   30.18
  SUBAREA AREA(ACRES) =   146.19       SUBAREA RUNOFF(CFS) =    3.50
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =      20.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   4.99
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10325.00 =    6562.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10325.00 TO NODE  10326.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2675.11  DOWNSTREAM(FEET) =   2541.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.28   CHANNEL SLOPE =  0.0465
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```

```
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.531
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -      321.78      0.60     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.50
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.91
AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =  12.22
Tc(MIN.) =   42.40
SUBAREA AREA(ACRES) =   321.78       SUBAREA RUNOFF(CFS) =    0.00
EFFECTIVE AREA(ACRES) =    574.47     AREA-AVERAGED Fm(INCH/HR) =   0.60
AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) =      574.5         PEAK FLOW RATE(CFS) =      20.50
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   3.91
LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.00 =    9424.58 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  10326.00 TO NODE  10326.50 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   2541.92  DOWNSTREAM(FEET) =   2438.80
CHANNEL LENGTH THRU SUBAREA(FEET) =  2617.40   CHANNEL SLOPE =  0.0394
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.476
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -      187.06      0.60     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.50
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.68
AVERAGE FLOW DEPTH(FEET) =   1.36   TRAVEL TIME(MIN.) =  11.86
Tc(MIN.) =   54.26
SUBAREA AREA(ACRES) =   187.06       SUBAREA RUNOFF(CFS) =    0.00
EFFECTIVE AREA(ACRES) =    761.53     AREA-AVERAGED Fm(INCH/HR) =   0.60
AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) =      761.5         PEAK FLOW RATE(CFS) =      20.50
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =   3.68
```



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LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.50 =   12041.98 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  10326.50 TO NODE  10327.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   2438.80  DOWNSTREAM(FEET) =   2414.64
CHANNEL LENGTH THRU SUBAREA(FEET) =  1181.79   CHANNEL SLOPE =  0.0204
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.458
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -       82.27      0.60     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.50
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.87
AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   6.87
Tc(MIN.) =   61.13
SUBAREA AREA(ACRES) =    82.27       SUBAREA RUNOFF(CFS) =    0.00
EFFECTIVE AREA(ACRES) =    843.80     AREA-AVERAGED Fm(INCH/HR) =   0.60
AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) =      843.8         PEAK FLOW RATE(CFS) =      20.50
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  1.54   FLOW VELOCITY(FEET/SEC.) =   2.87
LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.00 =   13223.77 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  10327.00 TO NODE  10327.50 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   2414.64  DOWNSTREAM(FEET) =   2389.73
CHANNEL LENGTH THRU SUBAREA(FEET) =  2431.92   CHANNEL SLOPE =  0.0102
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.423
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -      243.69      0.60     0.997     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.64
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.22
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  AVERAGE FLOW DEPTH(FEET) =   1.76   TRAVEL TIME(MIN.) =  18.24
  Tc(MIN.) =   79.37
  SUBAREA AREA(ACRES) =   243.69       SUBAREA RUNOFF(CFS) =    0.28
  EFFECTIVE AREA(ACRES) =   1087.49     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1087.5         PEAK FLOW RATE(CFS) =      20.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.76   FLOW VELOCITY(FEET/SEC.) =   2.21
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.50 =   15655.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2389.73  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.59   CHANNEL SLOPE =  0.0306
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.405
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.36      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.34
  AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   9.69
  Tc(MIN.) =   89.06
  SUBAREA AREA(ACRES) =    69.36       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1156.85     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1156.8         PEAK FLOW RATE(CFS) =      20.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOW VELOCITY(FEET/SEC.) =   3.34
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10330.00 =   17600.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   89.06
```



```
  RAINFALL INTENSITY(INCH/HR) =   0.40
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1156.85
  TOTAL STREAM AREA(ACRES) =    1156.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      20.50

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       19.69   93.58    0.398  0.60( 0.60) 0.99    1509.2   10300.00
      2       20.50   89.06    0.405  0.60( 0.60) 1.00    1156.8   10320.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       39.55   89.06    0.405  0.60( 0.60) 1.00    2593.2   10320.00
      2       39.84   93.58    0.398  0.60( 0.60) 1.00    2666.1   10300.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      39.84    Tc(MIN.) =    93.58
  EFFECTIVE AREA(ACRES) =    2666.06   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2666.1
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10330.00 TO NODE  10331.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2330.13  DOWNSTREAM(FEET) =   2041.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3034.53   CHANNEL SLOPE =  0.0951
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.386
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       70.23      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.04
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =   8.38
  Tc(MIN.) =  101.96
  SUBAREA AREA(ACRES) =    70.23       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2736.29     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
```

```
  TOTAL AREA(ACRES) =     2736.3         PEAK FLOW RATE(CFS) =      39.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   6.04
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10331.00 =   24386.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2041.66  DOWNSTREAM(FEET) =   1739.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3264.87   CHANNEL SLOPE =  0.0924
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.374
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      104.94      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.98
  AVERAGE FLOW DEPTH(FEET) =   1.49   TRAVEL TIME(MIN.) =   9.10
  Tc(MIN.) =  111.06
  SUBAREA AREA(ACRES) =   104.94       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2841.23     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2841.2         PEAK FLOW RATE(CFS) =      39.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.49   FLOW VELOCITY(FEET/SEC.) =   5.98
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S1.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)           (ACRES)     NODE
      1        6.10  228.47  0.60( 0.60) 1.00    2134.1   10100.00
```



```
    TOTAL AREA(ACRES) =     2134.1

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S2.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)           (ACRES)     NODE
      1       31.22   85.23  0.60( 0.60) 1.00    1569.4   10200.00
      2       27.57  123.69  0.60( 0.60) 1.00    1841.1   10210.00
    TOTAL AREA(ACRES) =     1841.1

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)           (ACRES)     NODE
      1       31.22   85.23  0.60( 0.60) 1.00    1569.4   10200.00
      2       27.57  123.69  0.60( 0.60) 1.00    1841.1   10210.00
    TOTAL AREA(ACRES) =      1841.1

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1       31.22   85.23    0.412  0.60( 0.60) 1.00    1569.4   10200.00
      2       27.57  123.69    0.358  0.60( 0.60) 1.00    1841.1   10210.00
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1        6.10  228.47    0.291  0.60( 0.60) 1.00    2134.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1       34.43   85.23    0.412  0.60( 0.60) 1.00    2365.5   10200.00
      2       31.62  123.69    0.358  0.60( 0.60) 1.00    2996.5   10210.00
      3       28.55  228.47    0.291  0.60( 0.60) 1.00    3975.2   10100.00
    TOTAL AREA(ACRES) =      3975.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       34.43  Tc(MIN.) =   85.234
  EFFECTIVE AREA(ACRES) =   2365.52  AREA-AVERAGED Fm(INCH/HR) =  0.60
```

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  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3975.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10222.00 TO NODE  10332.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1925.82  DOWNSTREAM(FEET) =   1739.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1475.92   CHANNEL SLOPE =  0.1259
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.405
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       19.92      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.47
  AVERAGE FLOW DEPTH(FEET) =   1.33   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   89.04
  SUBAREA AREA(ACRES) =    19.92       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2385.44     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3995.2         PEAK FLOW RATE(CFS) =      34.43
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.33   FLOW VELOCITY(FEET/SEC.) =   6.47
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       34.43   89.04    0.405  0.60( 0.60) 1.00    2385.4   10200.00
      2       31.62  127.58    0.355  0.60( 0.60) 1.00    3016.4   10210.00
      3       28.55  232.45    0.290  0.60( 0.60) 1.00    3995.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       39.55  106.53    0.380  0.60( 0.60) 1.00    2768.3   10320.00
      2       39.84  111.06    0.374  0.60( 0.60) 1.00    2841.2   10300.00
```



```
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       69.66   89.04    0.405  0.60( 0.60) 1.00    4699.1   10200.00
      2       72.71  106.53    0.380  0.60( 0.60) 1.00    5440.2   10320.00
      3       72.67  111.06    0.374  0.60( 0.60) 1.00    5587.2   10300.00
      4       69.44  127.58    0.355  0.60( 0.60) 1.00    5857.6   10210.00
      5       59.47  232.45    0.290  0.60( 0.60) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =      6836.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       72.71  Tc(MIN.) =  106.535
  EFFECTIVE AREA(ACRES) =   5440.17  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     6836.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     6836.4  TC(MIN.) =    106.53
  EFFECTIVE AREA(ACRES) =   5440.17  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.998
  PEAK FLOW RATE(CFS)   =      72.71

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       69.66   89.04    0.405  0.60( 0.60) 1.00    4699.1   10200.00
      2       72.71  106.53    0.380  0.60( 0.60) 1.00    5440.2   10320.00
      3       72.67  111.06    0.374  0.60( 0.60) 1.00    5587.2   10300.00
      4       69.44  127.58    0.355  0.60( 0.60) 1.00    5857.6   10210.00
      5       59.47  232.45    0.290  0.60( 0.60) 1.00    6836.4   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S4.DAT
  TIME/DATE OF STUDY: 10:39 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.148
   2)   10.00;  1.432
   3)   15.00;  1.057
   4)   20.00;  0.839
   5)   25.00;  0.709
   6)   30.00;  0.626
   7)   40.00;  0.542
   8)   50.00;  0.486
   9)   60.00;  0.456
  10)   90.00;  0.400
  11)  120.00;  0.357
  12)  180.00;  0.306
  13)  360.00;  0.238
  14) 1440.00;  0.108
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10400.00 TO NODE  10401.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.42
  ELEVATION DATA: UPSTREAM(FEET) =   2648.70  DOWNSTREAM(FEET) =   2536.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.799
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.979
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.89      0.60     1.000     0   16.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.01
  TOTAL AREA(ACRES) =      5.89   PEAK FLOW RATE(CFS) =      2.01

************************************************************************
  FLOW PROCESS FROM NODE  10401.00 TO NODE  10402.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2536.15  DOWNSTREAM(FEET) =   2504.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   934.06   CHANNEL SLOPE =  0.0340
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.736
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       17.57      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.18
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   7.15
  Tc(MIN.) =   23.95
  SUBAREA AREA(ACRES) =    17.57       SUBAREA RUNOFF(CFS) =    2.16
  EFFECTIVE AREA(ACRES) =     23.46     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.5         PEAK FLOW RATE(CFS) =       2.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   2.15
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.00 =    1884.48 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10402.00 TO NODE  10402.50 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2504.36  DOWNSTREAM(FEET) =   2462.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.55   CHANNEL SLOPE =  0.0439
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.624
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.74      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.52
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   6.30
  Tc(MIN.) =   30.25
  SUBAREA AREA(ACRES) =    56.74       SUBAREA RUNOFF(CFS) =    1.23
  EFFECTIVE AREA(ACRES) =     80.20     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       80.2         PEAK FLOW RATE(CFS) =       2.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   2.36
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.50 =    2836.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10402.50 TO NODE  10403.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.54  DOWNSTREAM(FEET) =   2433.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.41   CHANNEL SLOPE =  0.0299
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.557
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.01      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.02
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   7.98
  Tc(MIN.) =   38.23
  SUBAREA AREA(ACRES) =    68.01       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    148.21     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      148.2         PEAK FLOW RATE(CFS) =       2.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   2.02
```



```
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10403.00 =    3803.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10403.00 TO NODE  10404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2433.59  DOWNSTREAM(FEET) =   2239.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2934.12   CHANNEL SLOPE =  0.0662
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.468
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      301.25      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.74
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =  17.86
  Tc(MIN.) =   56.09
  SUBAREA AREA(ACRES) =   301.25       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    449.46     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      449.5         PEAK FLOW RATE(CFS) =       2.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   2.74
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10404.00 =    6737.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10404.00 TO NODE  10405.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2239.33  DOWNSTREAM(FEET) =   2128.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.32   CHANNEL SLOPE =  0.0386
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.424
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      152.68      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.25
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =  21.20
  Tc(MIN.) =   77.30
  SUBAREA AREA(ACRES) =   152.68       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    602.14     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      602.1         PEAK FLOW RATE(CFS) =       2.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   2.25
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10405.00 =    9599.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2128.80  DOWNSTREAM(FEET) =   1759.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.12   CHANNEL SLOPE =  0.1878
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.409
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      139.70      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.08
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   8.04
  Tc(MIN.) =   85.34
  SUBAREA AREA(ACRES) =   139.70       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    741.84     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      741.8         PEAK FLOW RATE(CFS) =       2.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   4.08
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10420.00 =   11566.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   85.34
  RAINFALL INTENSITY(INCH/HR) =   0.41
```



```
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     741.84
  TOTAL STREAM AREA(ACRES) =     741.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.88

****************************************************************************
  FLOW PROCESS FROM NODE  10410.00 TO NODE  10411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   413.10
  ELEVATION DATA: UPSTREAM(FEET) =   3217.26  DOWNSTREAM(FEET) =   3058.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.517
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.501
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        3.06      0.60     1.000     0    9.52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.48
  TOTAL AREA(ACRES) =      3.06   PEAK FLOW RATE(CFS) =      2.48

****************************************************************************
  FLOW PROCESS FROM NODE  10411.00 TO NODE  10412.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3058.86  DOWNSTREAM(FEET) =   2879.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.18   CHANNEL SLOPE =  0.3495
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.353
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.24      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.55
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   1.54
  Tc(MIN.) =   11.06
  SUBAREA AREA(ACRES) =     4.24       SUBAREA RUNOFF(CFS) =    2.87
  EFFECTIVE AREA(ACRES) =      7.30     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.3         PEAK FLOW RATE(CFS) =       4.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =   5.84
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10412.00 =     925.28 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  10412.00 TO NODE  10413.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.84  DOWNSTREAM(FEET) =   2644.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.24   CHANNEL SLOPE =  0.1208
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.946
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.95      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.00
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   6.48
  Tc(MIN.) =   17.54
  SUBAREA AREA(ACRES) =    47.95       SUBAREA RUNOFF(CFS) =   14.95
  EFFECTIVE AREA(ACRES) =     55.25     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.2         PEAK FLOW RATE(CFS) =      17.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   5.36
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10413.00 =    2869.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10413.00 TO NODE  10414.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2644.97  DOWNSTREAM(FEET) =   2550.42
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.61   CHANNEL SLOPE =  0.0468
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.697
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.60      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.12
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   8.17
  Tc(MIN.) =   25.71
  SUBAREA AREA(ACRES) =   151.60       SUBAREA RUNOFF(CFS) =   13.28
  EFFECTIVE AREA(ACRES) =    206.85     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.9         PEAK FLOW RATE(CFS) =      18.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   3.79
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10414.00 =    4889.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10414.00 TO NODE  10415.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2550.42  DOWNSTREAM(FEET) =   2391.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.76   CHANNEL SLOPE =  0.0830
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.606
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      206.03      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.78
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   6.69
  Tc(MIN.) =   32.40
  SUBAREA AREA(ACRES) =   206.03       SUBAREA RUNOFF(CFS) =    1.11
  EFFECTIVE AREA(ACRES) =    412.88     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      412.9         PEAK FLOW RATE(CFS) =      18.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =   4.71
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10415.00 =    6805.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10415.00 TO NODE  10416.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2391.31  DOWNSTREAM(FEET) =   2092.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2843.10   CHANNEL SLOPE =  0.1052
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.533
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      122.38      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.17
  AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   9.16
  Tc(MIN.) =   41.56
  SUBAREA AREA(ACRES) =   122.38       SUBAREA RUNOFF(CFS) =    0.00
```

```
  EFFECTIVE AREA(ACRES) =    535.26     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      535.3         PEAK FLOW RATE(CFS) =      18.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   5.17
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10416.00 =    9648.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2092.16  DOWNSTREAM(FEET) =   1759.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2151.95   CHANNEL SLOPE =  0.1546
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.499
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.94      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.92
  AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   6.06
  Tc(MIN.) =   47.62
  SUBAREA AREA(ACRES) =    59.94       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    595.20     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      595.2         PEAK FLOW RATE(CFS) =      18.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.01   FLOW VELOCITY(FEET/SEC.) =   5.92
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   47.62
  RAINFALL INTENSITY(INCH/HR) =   0.50
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
```



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  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     595.20
  TOTAL STREAM AREA(ACRES) =     595.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      18.12

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.88   85.34    0.409  0.60( 0.60) 1.00     741.8   10400.00
      2       18.12   47.62    0.499  0.60( 0.60) 1.00     595.2   10410.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       20.08   47.62    0.499  0.60( 0.60) 1.00    1009.2   10410.00
      2       17.71   85.34    0.409  0.60( 0.60) 1.00    1337.0   10400.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.08    Tc(MIN.) =    47.62
  EFFECTIVE AREA(ACRES) =    1009.17   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1337.0
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1759.52  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2477.21   CHANNEL SLOPE =  0.0287
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.455
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.64      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.24
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =  12.74
  Tc(MIN.) =   60.36
  SUBAREA AREA(ACRES) =    72.64       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1081.81     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1409.7         PEAK FLOW RATE(CFS) =      20.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.44   FLOW VELOCITY(FEET/SEC.) =   3.24
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S3.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       69.66   89.04  0.60( 0.60) 1.00    4699.1   10200.00
      2       72.71  106.53  0.60( 0.60) 1.00    5440.2   10320.00
      3       72.67  111.06  0.60( 0.60) 1.00    5587.2   10300.00
      4       69.44  127.58  0.60( 0.60) 1.00    5857.6   10210.00
      5       59.47  232.45  0.60( 0.60) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =     6836.4

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       69.66   89.04  0.60( 0.60) 1.00    4699.1   10200.00
      2       72.71  106.53  0.60( 0.60) 1.00    5440.2   10320.00
      3       72.67  111.06  0.60( 0.60) 1.00    5587.2   10300.00
      4       69.44  127.58  0.60( 0.60) 1.00    5857.6   10210.00
      5       59.47  232.45  0.60( 0.60) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =      6836.4

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10507.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1739.96  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2238.93   CHANNEL SLOPE =  0.0231
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.363
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      72.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.13
  AVERAGE FLOW DEPTH(FEET) =   2.42   TRAVEL TIME(MIN.) =   9.04
  Tc(MIN.) =  115.58
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   5502.10     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     6898.3         PEAK FLOW RATE(CFS) =      72.71
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.42   FLOW VELOCITY(FEET/SEC.) =   4.13
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       69.66   98.18    0.388  0.60( 0.60) 1.00    4761.1   10200.00
      2       72.71  115.58    0.363  0.60( 0.60) 1.00    5502.1   10320.00
      3       72.67  120.11    0.357  0.60( 0.60) 1.00    5649.1   10300.00
      4       69.44  136.74    0.343  0.60( 0.60) 1.00    5919.5   10210.00
      5       59.47  241.96    0.283  0.60( 0.60) 1.00    6898.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       20.08   60.36    0.455  0.60( 0.60) 1.00    1081.8   10410.00
      2       17.71   98.44    0.388  0.60( 0.60) 1.00    1409.7   10400.00
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       70.31   60.36    0.455  0.60( 0.60) 1.00    4008.9   10410.00
      2       87.39   98.18    0.388  0.60( 0.60) 1.00    6168.5   10200.00
      3       87.42   98.44    0.388  0.60( 0.60) 1.00    6181.6   10400.00
      4       89.30  115.58    0.363  0.60( 0.60) 1.00    6911.8   10320.00
      5       88.96  120.11    0.357  0.60( 0.60) 1.00    7058.8   10300.00
      6       85.09  136.74    0.343  0.60( 0.60) 1.00    7329.2   10210.00
      7       72.37  241.96    0.283  0.60( 0.60) 1.00    8308.0   10100.00
    TOTAL AREA(ACRES) =      8308.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       89.30  Tc(MIN.) =  115.576
  EFFECTIVE AREA(ACRES) =   6911.78  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
```

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  TOTAL AREA(ACRES) =     8308.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     8308.0  TC(MIN.) =    115.58
  EFFECTIVE AREA(ACRES) =   6911.78  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.998
  PEAK FLOW RATE(CFS)   =      89.30

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       70.31   60.36    0.455  0.60( 0.60) 1.00    4008.9   10410.00
      2       87.39   98.18    0.388  0.60( 0.60) 1.00    6168.5   10200.00
      3       87.42   98.44    0.388  0.60( 0.60) 1.00    6181.6   10400.00
      4       89.30  115.58    0.363  0.60( 0.60) 1.00    6911.8   10320.00
      5       88.96  120.11    0.357  0.60( 0.60) 1.00    7058.8   10300.00
      6       85.09  136.74    0.343  0.60( 0.60) 1.00    7329.2   10210.00
      7       72.37  241.96    0.283  0.60( 0.60) 1.00    8308.0   10100.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S5.DAT
  TIME/DATE OF STUDY: 10:39 04/01/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.148
   2)   10.00;  1.432
   3)   15.00;  1.057
   4)   20.00;  0.839
   5)   25.00;  0.709
   6)   30.00;  0.626
   7)   40.00;  0.542
   8)   50.00;  0.486
   9)   60.00;  0.456
  10)   90.00;  0.400
  11)  120.00;  0.357
  12)  180.00;  0.306
  13)  360.00;  0.238
  14) 1440.00;  0.108
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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 ************************************************************************
  FLOW PROCESS FROM NODE  10500.00 TO NODE  10501.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.64
  ELEVATION DATA: UPSTREAM(FEET) =   3108.31  DOWNSTREAM(FEET) =   3060.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.565
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.924
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          -        1.54      0.60      0.910      0    6.57
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
  SUBAREA RUNOFF(CFS) =      1.91
  TOTAL AREA(ACRES) =      1.54   PEAK FLOW RATE(CFS) =      1.91

 ************************************************************************
  FLOW PROCESS FROM NODE  10501.00 TO NODE  10502.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3060.24  DOWNSTREAM(FEET) =   2942.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.48   CHANNEL SLOPE =  0.1703
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.565
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.27      0.60      0.943     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.943
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   2.50
  Tc(MIN.) =    9.07
  SUBAREA AREA(ACRES) =     8.27       SUBAREA RUNOFF(CFS) =    7.44
  EFFECTIVE AREA(ACRES) =      9.81     AREA-AVERAGED Fm(INCH/HR) =   0.56
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =        9.8         PEAK FLOW RATE(CFS) =       8.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   5.13
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10502.00 =     986.12 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  10502.00 TO NODE  10503.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2942.64  DOWNSTREAM(FEET) =   2815.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   957.31   CHANNEL SLOPE =  0.1331
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.278
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.91      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.34
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   12.06
  SUBAREA AREA(ACRES) =    18.91       SUBAREA RUNOFF(CFS) =   11.53
  EFFECTIVE AREA(ACRES) =     28.72     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       28.7         PEAK FLOW RATE(CFS) =      17.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   5.58
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10503.00 =    1943.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10503.00 TO NODE  10504.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2815.24  DOWNSTREAM(FEET) =   2202.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2096.20   CHANNEL SLOPE =  0.2923
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.010
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.49      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.71
  AVERAGE FLOW DEPTH(FEET) =   1.11   TRAVEL TIME(MIN.) =   4.01
  Tc(MIN.) =   16.07
  SUBAREA AREA(ACRES) =    75.49       SUBAREA RUNOFF(CFS) =   27.89
  EFFECTIVE AREA(ACRES) =    104.21     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =      38.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   9.18
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10504.00 =    4039.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10504.00 TO NODE  10505.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



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  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2202.44  DOWNSTREAM(FEET) =   1969.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.32   CHANNEL SLOPE =  0.0834
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.751
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      278.21      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.37
  AVERAGE FLOW DEPTH(FEET) =   1.77   TRAVEL TIME(MIN.) =   7.33
  Tc(MIN.) =   23.40
  SUBAREA AREA(ACRES) =   278.21       SUBAREA RUNOFF(CFS) =   37.73
  EFFECTIVE AREA(ACRES) =    382.42     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      382.4         PEAK FLOW RATE(CFS) =      52.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.68   FLOW VELOCITY(FEET/SEC.) =   6.15
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10505.00 =    6839.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10505.00 TO NODE  10506.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1969.00  DOWNSTREAM(FEET) =   1759.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.99   CHANNEL SLOPE =  0.0725
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.613
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      323.47      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.91
  AVERAGE FLOW DEPTH(FEET) =   1.76   TRAVEL TIME(MIN.) =   8.15
  Tc(MIN.) =   31.55
  SUBAREA AREA(ACRES) =   323.47       SUBAREA RUNOFF(CFS) =    3.81
  EFFECTIVE AREA(ACRES) =    705.89     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      705.9         PEAK FLOW RATE(CFS) =      52.20
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.73   FLOW VELOCITY(FEET/SEC.) =   5.83
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10506.00 =    9732.94 FEET.

****************************************************************************
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```
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1759.23  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2597.28   CHANNEL SLOPE =  0.0273
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.529
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.34      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.05
  AVERAGE FLOW DEPTH(FEET) =   2.07   TRAVEL TIME(MIN.) =  10.68
  Tc(MIN.) =   42.24
  SUBAREA AREA(ACRES) =   212.34       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    918.23     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      918.2         PEAK FLOW RATE(CFS) =      52.20
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.07   FLOW VELOCITY(FEET/SEC.) =   4.05
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      918.2  TC(MIN.) =     42.24
  EFFECTIVE AREA(ACRES) =    918.23  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =      52.20
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S6.DAT
  TIME/DATE OF STUDY: 10:39 04/01/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.126
   2)   10.00;  1.418
   3)   15.00;  1.049
   4)   20.00;  0.834
   5)   25.00;  0.706
   6)   30.00;  0.623
   7)   40.00;  0.540
   8)   50.00;  0.483
   9)   60.00;  0.453
  10)   90.00;  0.396
  11)  120.00;  0.353
  12)  180.00;  0.302
  13)  360.00;  0.234
  14) 1440.00;  0.106
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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 ************************************************************************
  FLOW PROCESS FROM NODE  10600.00 TO NODE  10601.00 IS CODE =  21
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  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   312.13
  ELEVATION DATA: UPSTREAM(FEET) =   3250.51  DOWNSTREAM(FEET) =   3126.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.451
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.637
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.47      0.60     1.000     0    8.45
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.31
  TOTAL AREA(ACRES) =      2.47   PEAK FLOW RATE(CFS) =      2.31

 ************************************************************************
  FLOW PROCESS FROM NODE  10601.00 TO NODE  10602.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3126.78  DOWNSTREAM(FEET) =   2951.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.40   CHANNEL SLOPE =  0.2828
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.390
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        6.58      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.35
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   10.38
  SUBAREA AREA(ACRES) =     6.58       SUBAREA RUNOFF(CFS) =    4.68
  EFFECTIVE AREA(ACRES) =      9.05     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =       6.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   5.81
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10602.00 =     932.53 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  10602.00 TO NODE  10603.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
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```
  ELEVATION DATA: UPSTREAM(FEET) =   2951.30  DOWNSTREAM(FEET) =   2641.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1930.18   CHANNEL SLOPE =  0.1606
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.019
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.78      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.06
  AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   5.31
  Tc(MIN.) =   15.70
  SUBAREA AREA(ACRES) =    60.78       SUBAREA RUNOFF(CFS) =   22.93
  EFFECTIVE AREA(ACRES) =     69.83     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.8         PEAK FLOW RATE(CFS) =      26.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =   6.65
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10603.00 =    2862.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10603.00 TO NODE  10604.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2641.28  DOWNSTREAM(FEET) =   2318.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.90   CHANNEL SLOPE =  0.1640
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.826
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.78      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.10
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   4.62
  Tc(MIN.) =   20.32
  SUBAREA AREA(ACRES) =    68.78       SUBAREA RUNOFF(CFS) =   13.99
  EFFECTIVE AREA(ACRES) =    138.61     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      138.6         PEAK FLOW RATE(CFS) =      28.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.18   FLOW VELOCITY(FEET/SEC.) =   6.78
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10604.00 =    4829.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10604.00 TO NODE  10605.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



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  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2318.61  DOWNSTREAM(FEET) =   1983.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2601.81   CHANNEL SLOPE =  0.1286
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.674
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      178.16      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.54
  AVERAGE FLOW DEPTH(FEET) =   1.33   TRAVEL TIME(MIN.) =   6.63
  Tc(MIN.) =   26.95
  SUBAREA AREA(ACRES) =   178.16       SUBAREA RUNOFF(CFS) =   11.83
  EFFECTIVE AREA(ACRES) =    316.77     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      316.8         PEAK FLOW RATE(CFS) =      28.20
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   6.20
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10605.00 =    7431.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1983.94  DOWNSTREAM(FEET) =   1655.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2439.06   CHANNEL SLOPE =  0.1348
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.595
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.31      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.34
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   6.41
  Tc(MIN.) =   33.36
  SUBAREA AREA(ACRES) =    61.31       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    378.08     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      378.1         PEAK FLOW RATE(CFS) =      28.20
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   6.34
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S4.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       70.31   60.36  0.60( 0.60) 1.00    4008.9   10410.00
      2       87.39   98.18  0.60( 0.60) 1.00    6168.5   10200.00
      3       87.42   98.44  0.60( 0.60) 1.00    6181.6   10400.00
      4       89.30  115.58  0.60( 0.60) 1.00    6911.8   10320.00
      5       88.96  120.11  0.60( 0.60) 1.00    7058.8   10300.00
      6       85.09  136.74  0.60( 0.60) 1.00    7329.2   10210.00
      7       72.37  241.96  0.60( 0.60) 1.00    8308.0   10100.00
    TOTAL AREA(ACRES) =     8308.0

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S5.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       52.20   42.24  0.60( 0.60) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =      918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       52.20   42.24  0.60( 0.60) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =       918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
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  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       52.20   42.24    0.527  0.60( 0.60) 1.00     918.2   10500.00
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       70.31   60.36    0.452  0.60( 0.60) 1.00    4008.9   10410.00
      2       87.39   98.18    0.384  0.60( 0.60) 1.00    6168.5   10200.00
      3       87.42   98.44    0.384  0.60( 0.60) 1.00    6181.6   10400.00
      4       89.30  115.58    0.359  0.60( 0.60) 1.00    6911.8   10320.00
      5       88.96  120.11    0.353  0.60( 0.60) 1.00    7058.8   10300.00
      6       85.09  136.74    0.339  0.60( 0.60) 1.00    7329.2   10210.00
      7       72.37  241.96    0.279  0.60( 0.60) 1.00    8308.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      109.54   42.24    0.527  0.60( 0.60) 1.00    3723.4   10500.00
      2      115.09   60.36    0.452  0.60( 0.60) 1.00    4927.2   10410.00
      3      125.43   98.18    0.384  0.60( 0.60) 1.00    7086.8   10200.00
      4      125.43   98.44    0.384  0.60( 0.60) 1.00    7099.9   10400.00
      5      124.87  115.58    0.359  0.60( 0.60) 1.00    7830.0   10320.00
      6      123.90  120.11    0.353  0.60( 0.60) 1.00    7977.0   10300.00
      7      118.63  136.74    0.339  0.60( 0.60) 1.00    8247.4   10210.00
      8       99.95  241.96    0.279  0.60( 0.60) 1.00    9226.2   10100.00
    TOTAL AREA(ACRES) =      9226.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      125.43  Tc(MIN.) =   98.180
  EFFECTIVE AREA(ACRES) =   7086.76  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     9226.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10507.00 TO NODE  10620.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1688.35  DOWNSTREAM(FEET) =   1655.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2570.61   CHANNEL SLOPE =  0.0129
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.368
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       83.74      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     125.43
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 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.80
 AVERAGE FLOW DEPTH(FEET) =   3.32   TRAVEL TIME(MIN.) =  11.27
 Tc(MIN.) =  109.45
 SUBAREA AREA(ACRES) =    83.74       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   7170.50     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     9310.0         PEAK FLOW RATE(CFS) =     125.43
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.32   FLOW VELOCITY(FEET/SEC.) =   3.80
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      109.54   53.91     0.471  0.60( 0.60) 1.00    3807.2   10500.00
     2      115.09   71.86     0.430  0.60( 0.60) 1.00    5010.9   10410.00
     3      125.43  109.45     0.368  0.60( 0.60) 1.00    7170.5   10200.00
     4      125.43  109.70     0.368  0.60( 0.60) 1.00    7183.6   10400.00
     5      124.87  126.84     0.347  0.60( 0.60) 1.00    7913.7   10320.00
     6      123.90  131.41     0.343  0.60( 0.60) 1.00    8060.8   10300.00
     7      118.63  148.17     0.329  0.60( 0.60) 1.00    8331.2   10210.00
     8       99.95  253.90     0.274  0.60( 0.60) 1.00    9310.0   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       28.20   33.36     0.595  0.60( 0.60) 1.00     378.1   10600.00
 LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      113.80   33.36     0.595  0.60( 0.60) 1.00    2734.2   10600.00
     2      131.88   53.91     0.471  0.60( 0.60) 1.00    4185.3   10500.00
     3      135.48   71.86     0.430  0.60( 0.60) 1.00    5389.0   10410.00
     4      142.88  109.45     0.368  0.60( 0.60) 1.00    7548.6   10200.00
     5      142.85  109.70     0.368  0.60( 0.60) 1.00    7561.7   10400.00
     6      141.32  126.84     0.347  0.60( 0.60) 1.00    8291.8   10320.00
     7      140.17  131.41     0.343  0.60( 0.60) 1.00    8438.9   10300.00
     8      134.22  148.17     0.329  0.60( 0.60) 1.00    8709.3   10210.00
     9      112.94  253.90     0.274  0.60( 0.60) 1.00    9688.1   10100.00
   TOTAL AREA(ACRES) =      9688.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      142.88  Tc(MIN.) =  109.447
 EFFECTIVE AREA(ACRES) =   7548.58  AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
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 TOTAL AREA(ACRES) =     9688.1
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10620.00 TO NODE  10621.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1655.24  DOWNSTREAM(FEET) =   1584.84
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2294.47   CHANNEL SLOPE =  0.0307
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.358
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      342.43      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     142.88
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.45
 AVERAGE FLOW DEPTH(FEET) =   2.96   TRAVEL TIME(MIN.) =   7.02
 Tc(MIN.) =  116.47
 SUBAREA AREA(ACRES) =   342.43       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   7891.01     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =    10030.5         PEAK FLOW RATE(CFS) =     142.88
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.96   FLOW VELOCITY(FEET/SEC.) =   5.45
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10621.00 =   40157.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1584.84  DOWNSTREAM(FEET) =   1443.87
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2923.79   CHANNEL SLOPE =  0.0482
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.350
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      160.90      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     142.88
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.44
  AVERAGE FLOW DEPTH(FEET) =   2.72   TRAVEL TIME(MIN.) =   7.56
  Tc(MIN.) =  124.03
  SUBAREA AREA(ACRES) =   160.90       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   8051.91     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    10191.4         PEAK FLOW RATE(CFS) =     142.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.72   FLOW VELOCITY(FEET/SEC.) =   6.44
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  124.03
  RAINFALL INTENSITY(INCH/HR) =   0.35
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    8051.91
  TOTAL STREAM AREA(ACRES) =   10191.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     142.88

****************************************************************************
  FLOW PROCESS FROM NODE  10630.00 TO NODE  10631.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.79
  ELEVATION DATA: UPSTREAM(FEET) =   3257.00  DOWNSTREAM(FEET) =   3147.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.430
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.640
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.25      0.60     1.000     0    8.43
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.17
  TOTAL AREA(ACRES) =      1.25   PEAK FLOW RATE(CFS) =      1.17

****************************************************************************
  FLOW PROCESS FROM NODE  10631.00 TO NODE  10632.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3147.13  DOWNSTREAM(FEET) =   2774.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   640.96   CHANNEL SLOPE =  0.5817
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.408
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.75      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.25
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   1.71
  Tc(MIN.) =   10.14
  SUBAREA AREA(ACRES) =     4.75       SUBAREA RUNOFF(CFS) =    3.45
  EFFECTIVE AREA(ACRES) =      6.00     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =       4.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   6.85
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10632.00 =     939.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10632.00 TO NODE  10633.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2774.29  DOWNSTREAM(FEET) =   2004.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.65   CHANNEL SLOPE =  0.4039
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.153
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.75      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.21
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   3.45
  Tc(MIN.) =   13.59
  SUBAREA AREA(ACRES) =    79.75       SUBAREA RUNOFF(CFS) =   39.72
  EFFECTIVE AREA(ACRES) =     85.75     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       85.8         PEAK FLOW RATE(CFS) =      42.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.16   FLOW VELOCITY(FEET/SEC.) =  10.53
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10633.00 =    2845.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10633.00 TO NODE  10634.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.58  DOWNSTREAM(FEET) =   1714.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1868.05   CHANNEL SLOPE =  0.1550
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.945
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.45      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.13
  AVERAGE FLOW DEPTH(FEET) =   1.60   TRAVEL TIME(MIN.) =   3.83
  Tc(MIN.) =   17.42
  SUBAREA AREA(ACRES) =   124.45       SUBAREA RUNOFF(CFS) =   38.67
  EFFECTIVE AREA(ACRES) =    210.20     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      210.2         PEAK FLOW RATE(CFS) =      65.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.63   FLOW VELOCITY(FEET/SEC.) =   8.22
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10634.00 =    4713.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1714.99  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.34   CHANNEL SLOPE =  0.1609
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.815
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       42.00      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.47
  AVERAGE FLOW DEPTH(FEET) =   1.65   TRAVEL TIME(MIN.) =   3.32
  Tc(MIN.) =   20.73
  SUBAREA AREA(ACRES) =    42.00       SUBAREA RUNOFF(CFS) =    8.14
  EFFECTIVE AREA(ACRES) =    252.20     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.2         PEAK FLOW RATE(CFS) =      65.32
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =   8.35
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10640.00 =    6398.79 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.73
  RAINFALL INTENSITY(INCH/HR) =   0.82
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     252.20
  TOTAL STREAM AREA(ACRES) =     252.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      65.32

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      113.80   48.83    0.490  0.60( 0.60) 1.00    3237.5   10600.00
      1      131.88   68.79    0.436  0.60( 0.60) 1.00    4688.6   10500.00
      1      135.48   86.66    0.402  0.60( 0.60) 1.00    5892.3   10410.00
      1      142.88  124.03    0.350  0.60( 0.60) 1.00    8051.9   10200.00
      1      142.85  124.29    0.349  0.60( 0.60) 1.00    8065.0   10400.00
      1      141.32  141.47    0.335  0.60( 0.60) 1.00    8795.2   10320.00
      1      140.17  146.08    0.331  0.60( 0.60) 1.00    8942.2   10300.00
      1      134.22  162.99    0.316  0.60( 0.60) 1.00    9212.6   10210.00
      1      112.94  269.40    0.268  0.60( 0.60) 1.00   10191.4   10100.00
      2       65.32   20.73    0.815  0.60( 0.60) 1.00     252.2   10630.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      145.76   20.73    0.815  0.60( 0.60) 1.00    1626.9   10630.00
      2      113.80   48.83    0.490  0.60( 0.60) 1.00    3489.7   10600.00
      3      131.87   68.79    0.436  0.60( 0.60) 1.00    4940.8   10500.00
      4      135.48   86.66    0.402  0.60( 0.60) 1.00    6144.5   10410.00
      5      142.88  124.03    0.350  0.60( 0.60) 1.00    8304.1   10200.00
      6      142.85  124.29    0.349  0.60( 0.60) 1.00    8317.2   10400.00
      7      141.32  141.47    0.335  0.60( 0.60) 1.00    9047.4   10320.00
      8      140.17  146.08    0.331  0.60( 0.60) 1.00    9194.4   10300.00
      9      134.22  162.99    0.316  0.60( 0.60) 1.00    9464.8   10210.00
     10      112.94  269.40    0.268  0.60( 0.60) 1.00   10443.6   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     145.76    Tc(MIN.) =    20.73
  EFFECTIVE AREA(ACRES) =    1626.86   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    10443.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1443.87  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2254.45   CHANNEL SLOPE =  0.0548
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.686
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.37      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     149.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.84
  AVERAGE FLOW DEPTH(FEET) =   2.70   TRAVEL TIME(MIN.) =   5.49
  Tc(MIN.) =   26.22
  SUBAREA AREA(ACRES) =    94.37       SUBAREA RUNOFF(CFS) =    7.29
  EFFECTIVE AREA(ACRES) =   1721.23     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10538.0         PEAK FLOW RATE(CFS) =     145.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.68   FLOW VELOCITY(FEET/SEC.) =   6.79
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    10538.0  TC(MIN.) =     26.22
  EFFECTIVE AREA(ACRES) =   1721.23  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =     145.76

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      145.76   26.22    0.686  0.60( 0.60) 1.00    1721.2   10630.00
      2      113.80   54.71    0.469  0.60( 0.60) 1.00    3584.1   10600.00
      3      131.87   74.46    0.426  0.60( 0.60) 1.00    5035.2   10500.00
      4      135.48   92.30    0.393  0.60( 0.60) 1.00    6238.9   10410.00
      5      142.88  129.58    0.345  0.60( 0.60) 1.00    8398.5   10200.00
      6      142.85  129.84    0.345  0.60( 0.60) 1.00    8411.6   10400.00
      7      141.32  147.04    0.330  0.60( 0.60) 1.00    9141.7   10320.00
      8      140.17  151.66    0.326  0.60( 0.60) 1.00    9288.8   10300.00
      9      134.22  168.63    0.312  0.60( 0.60) 1.00    9559.2   10210.00
     10      112.94  275.29    0.266  0.60( 0.60) 1.00   10538.0   10100.00
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S7.DAT
  TIME/DATE OF STUDY: 10:39 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.126
   2)   10.00;  1.418
   3)   15.00;  1.049
   4)   20.00;  0.834
   5)   25.00;  0.706
   6)   30.00;  0.623
   7)   40.00;  0.540
   8)   50.00;  0.483
   9)   60.00;  0.453
  10)   90.00;  0.396
  11)  120.00;  0.353
  12)  180.00;  0.302
  13)  360.00;  0.234
  14) 1440.00;  0.106
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10700.00 TO NODE  10701.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   281.18
  ELEVATION DATA: UPSTREAM(FEET) =   3512.68  DOWNSTREAM(FEET) =   3444.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.938
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.568
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.30      0.60     1.000     0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.13
  TOTAL AREA(ACRES) =      1.30   PEAK FLOW RATE(CFS) =      1.13

**************************************************************************
  FLOW PROCESS FROM NODE  10701.00 TO NODE  10702.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3444.33  DOWNSTREAM(FEET) =   3246.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   700.05   CHANNEL SLOPE =  0.2823
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.321
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.49      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.91
  AVERAGE FLOW DEPTH(FEET) =   0.47   TRAVEL TIME(MIN.) =   2.37
  Tc(MIN.) =   11.31
  SUBAREA AREA(ACRES) =     6.49       SUBAREA RUNOFF(CFS) =    4.21
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =       5.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   5.38
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10702.00 =     981.23 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10702.00 TO NODE  10703.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   3246.68  DOWNSTREAM(FEET) =   3075.14
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1893.56   CHANNEL SLOPE =  0.0906
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.880
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       31.98      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.14
 AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   7.61
 Tc(MIN.) =   18.93
 SUBAREA AREA(ACRES) =    31.98       SUBAREA RUNOFF(CFS) =    8.07
 EFFECTIVE AREA(ACRES) =     39.77     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       39.8         PEAK FLOW RATE(CFS) =      10.03

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.89   FLOW VELOCITY(FEET/SEC.) =   4.22
 LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.00 =    2874.79 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10703.00 TO NODE  10703.50 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3075.14  DOWNSTREAM(FEET) =   2952.03
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2060.61   CHANNEL SLOPE =  0.0597
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.655
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       34.58      0.60     0.872     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.872
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.20
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.76
 AVERAGE FLOW DEPTH(FEET) =   1.04   TRAVEL TIME(MIN.) =   9.15
 Tc(MIN.) =   28.07
 SUBAREA AREA(ACRES) =    34.58       SUBAREA RUNOFF(CFS) =    4.11
 EFFECTIVE AREA(ACRES) =     74.35     AREA-AVERAGED Fm(INCH/HR) =   0.56
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.94
 TOTAL AREA(ACRES) =       74.4         PEAK FLOW RATE(CFS) =      10.03
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   3.60
 LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.50 =    4935.40 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10703.50 TO NODE  10704.00 IS CODE =  51
----------------------------------------------------------------------------
```



```
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2952.03  DOWNSTREAM(FEET) =   2895.59
 CHANNEL LENGTH THRU SUBAREA(FEET) =   930.70   CHANNEL SLOPE =  0.0606
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.604
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       30.69      0.60     0.951     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.65
 AVERAGE FLOW DEPTH(FEET) =   0.98   TRAVEL TIME(MIN.) =   4.25
 Tc(MIN.) =   32.32
 SUBAREA AREA(ACRES) =    30.69       SUBAREA RUNOFF(CFS) =    0.92
 EFFECTIVE AREA(ACRES) =    105.04     AREA-AVERAGED Fm(INCH/HR) =   0.57
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.94
 TOTAL AREA(ACRES) =      105.0         PEAK FLOW RATE(CFS) =      10.03
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   3.60
 LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10704.00 =    5866.10 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2895.59  DOWNSTREAM(FEET) =   2581.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2585.44   CHANNEL SLOPE =  0.1217
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.533
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      199.40      0.60     0.977     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.15
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.79
 AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   8.99
 Tc(MIN.) =   41.31
 SUBAREA AREA(ACRES) =   199.40       SUBAREA RUNOFF(CFS) =    2.20
 EFFECTIVE AREA(ACRES) =    304.44     AREA-AVERAGED Fm(INCH/HR) =   0.58
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      304.4         PEAK FLOW RATE(CFS) =      10.03
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) =   4.69
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.31
  RAINFALL INTENSITY(INCH/HR) =   0.53
  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     304.44
  TOTAL STREAM AREA(ACRES) =     304.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.03

****************************************************************************
  FLOW PROCESS FROM NODE  10710.00 TO NODE  10711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.64
  ELEVATION DATA: UPSTREAM(FEET) =   3389.13  DOWNSTREAM(FEET) =   3276.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.438
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.312
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK               -        7.76      0.60     0.981     0   11.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.981
  SUBAREA RUNOFF(CFS) =      5.05
  TOTAL AREA(ACRES) =      7.76   PEAK FLOW RATE(CFS) =      5.05

****************************************************************************
  FLOW PROCESS FROM NODE  10711.00 TO NODE  10712.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3276.30  DOWNSTREAM(FEET) =   3152.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   950.69   CHANNEL SLOPE =  0.1305
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.070
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       22.39      0.60     0.988     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.988
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.84
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   3.28
  Tc(MIN.) =   14.71
  SUBAREA AREA(ACRES) =    22.39       SUBAREA RUNOFF(CFS) =    9.62
  EFFECTIVE AREA(ACRES) =     30.15     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       30.1          PEAK FLOW RATE(CFS) =      12.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.92   FLOW VELOCITY(FEET/SEC.) =   5.13
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10712.00 =    1894.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10712.00 TO NODE  10713.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3152.26  DOWNSTREAM(FEET) =   2879.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.77   CHANNEL SLOPE =  0.1431
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.827
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       42.59      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.72
  AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   5.56
  Tc(MIN.) =   20.28
  SUBAREA AREA(ACRES) =    42.59       SUBAREA RUNOFF(CFS) =    8.70
  EFFECTIVE AREA(ACRES) =     72.74     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       72.7          PEAK FLOW RATE(CFS) =      15.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   5.50
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10713.00 =    3804.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.03  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2621.96   CHANNEL SLOPE =  0.1136
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.651
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -      156.72      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.42
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   8.07
  Tc(MIN.) =   28.34
  SUBAREA AREA(ACRES) =   156.72       SUBAREA RUNOFF(CFS) =    7.14
  EFFECTIVE AREA(ACRES) =    229.46     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      229.5         PEAK FLOW RATE(CFS) =      15.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   5.07
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10720.00 =    6426.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.34
  RAINFALL INTENSITY(INCH/HR) =   0.65
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     229.46
  TOTAL STREAM AREA(ACRES) =     229.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      15.09

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       10.03   41.31    0.533  0.60( 0.58) 0.97     304.4   10700.00
      2       15.09   28.34    0.651  0.60( 0.60) 1.00     229.5   10710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       25.12   28.34    0.651  0.60( 0.59) 0.98     438.4   10710.00
      2       10.31   41.31    0.533  0.60( 0.59) 0.98     533.9   10700.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      25.12    Tc(MIN.) =    28.34
  EFFECTIVE AREA(ACRES) =     438.35   AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =      533.9
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.00 TO NODE  10720.50 IS CODE =  51
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.07  DOWNSTREAM(FEET) =   2523.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.13   CHANNEL SLOPE =  0.0339
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.572
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.31      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.66
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   7.75
  Tc(MIN.) =   36.09
  SUBAREA AREA(ACRES) =   116.31       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    554.66     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      650.2         PEAK FLOW RATE(CFS) =      25.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =   3.66
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.50 =   10150.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.50 TO NODE  10721.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2523.48  DOWNSTREAM(FEET) =   2488.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1575.08   CHANNEL SLOPE =  0.0221
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.514
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.28      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.12
  AVERAGE FLOW DEPTH(FEET) =   1.64   TRAVEL TIME(MIN.) =   8.40
  Tc(MIN.) =   44.49
  SUBAREA AREA(ACRES) =    82.28       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    636.94     AREA-AVERAGED Fm(INCH/HR) =   0.59
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      732.5         PEAK FLOW RATE(CFS) =      25.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.64   FLOW VELOCITY(FEET/SEC.) =   3.12
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.00 =   11725.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.00 TO NODE  10721.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2488.66  DOWNSTREAM(FEET) =   2453.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2032.11   CHANNEL SLOPE =  0.0174
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.464
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      259.52      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.85
  AVERAGE FLOW DEPTH(FEET) =   1.71   TRAVEL TIME(MIN.) =  11.88
  Tc(MIN.) =   56.37
  SUBAREA AREA(ACRES) =   259.52       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    896.46     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      992.0         PEAK FLOW RATE(CFS) =      25.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =   2.85
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.50 =   13757.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.50 TO NODE  10722.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.35  DOWNSTREAM(FEET) =   2384.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1842.37   CHANNEL SLOPE =  0.0374
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.445
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      229.78      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.80
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =   8.08
  Tc(MIN.) =   64.46
  SUBAREA AREA(ACRES) =   229.78       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1126.24     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1221.8         PEAK FLOW RATE(CFS) =      25.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   3.80
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10722.00 =   15600.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10722.00 TO NODE  10723.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2384.52  DOWNSTREAM(FEET) =   1925.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3780.37   CHANNEL SLOPE =  0.1214
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.424
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      308.58      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.88
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =  10.71
  Tc(MIN.) =   75.16
  SUBAREA AREA(ACRES) =   308.58       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1434.82     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1530.4         PEAK FLOW RATE(CFS) =      25.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   5.88
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10723.00 =   19380.60 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1925.64  DOWNSTREAM(FEET) =   1320.32
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3826.73   CHANNEL SLOPE =  0.1582
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.406
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      434.11      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.12
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.51
 AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   9.79
 Tc(MIN.) =   84.96
 SUBAREA AREA(ACRES) =   434.11       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   1868.93     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1964.5         PEAK FLOW RATE(CFS) =      25.12
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =   6.51
 LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1964.5  TC(MIN.) =     84.96
 EFFECTIVE AREA(ACRES) =   1868.93  AREA-AVERAGED Fm(INCH/HR)=  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.996
 PEAK FLOW RATE(CFS)   =      25.12

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       25.12   84.96    0.406  0.60( 0.60) 1.00    1868.9   10710.00
     2       10.31  112.06    0.364  0.60( 0.60) 0.99    1964.5   10700.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S8.DAT
  TIME/DATE OF STUDY: 10:39 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.077
   2)   10.00;  1.385
   3)   15.00;  1.029
   4)   20.00;  0.823
   5)   25.00;  0.698
   6)   30.00;  0.617
   7)   40.00;  0.534
   8)   50.00;  0.478
   9)   60.00;  0.445
  10)   90.00;  0.387
  11)  120.00;  0.344
  12)  180.00;  0.293
  13)  360.00;  0.225
  14) 1440.00;  0.102
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10800.00 TO NODE  10801.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.93
  ELEVATION DATA: UPSTREAM(FEET) =   2617.19  DOWNSTREAM(FEET) =   2506.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.540
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.726
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.83      0.60     1.000     0    7.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.84
  TOTAL AREA(ACRES) =      0.83   PEAK FLOW RATE(CFS) =      0.84

**************************************************************************
  FLOW PROCESS FROM NODE  10801.00 TO NODE  10802.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2506.15  DOWNSTREAM(FEET) =   2237.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.01   CHANNEL SLOPE =  0.3968
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.434
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.30      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.36
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   2.11
  Tc(MIN.) =    9.65
  SUBAREA AREA(ACRES) =     5.30       SUBAREA RUNOFF(CFS) =    3.98
  EFFECTIVE AREA(ACRES) =      6.13     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =       4.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.51   FLOW VELOCITY(FEET/SEC.) =   5.98
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10802.00 =     925.94 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10802.00 TO NODE  10803.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2237.54  DOWNSTREAM(FEET) =   1920.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =   954.74   CHANNEL SLOPE =  0.3325
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.244
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.25      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.82
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.33
  Tc(MIN.) =   11.98
  SUBAREA AREA(ACRES) =    18.25       SUBAREA RUNOFF(CFS) =   10.58
  EFFECTIVE AREA(ACRES) =     24.38     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.4         PEAK FLOW RATE(CFS) =      14.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   7.43
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10803.00 =    1880.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1920.11  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2201.18   CHANNEL SLOPE =  0.2865
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.972
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.99      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.32
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   4.41
  Tc(MIN.) =   16.39
  SUBAREA AREA(ACRES) =    78.99       SUBAREA RUNOFF(CFS) =   26.45
  EFFECTIVE AREA(ACRES) =    103.37     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      103.4         PEAK FLOW RATE(CFS) =      34.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.14   FLOW VELOCITY(FEET/SEC.) =   8.85
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```



```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S6.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      145.76   26.22  0.60( 0.60) 1.00    1721.2   10630.00
      2      113.80   54.71  0.60( 0.60) 1.00    3584.1   10600.00
      3      131.87   74.46  0.60( 0.60) 1.00    5035.2   10500.00
      4      135.48   92.30  0.60( 0.60) 1.00    6238.9   10410.00
      5      142.88  129.58  0.60( 0.60) 1.00    8398.5   10200.00
      6      142.85  129.84  0.60( 0.60) 1.00    8411.6   10400.00
      7      141.32  147.04  0.60( 0.60) 1.00    9141.7   10320.00
      8      140.17  151.66  0.60( 0.60) 1.00    9288.8   10300.00
      9      134.22  168.63  0.60( 0.60) 1.00    9559.2   10210.00
     10      112.94  275.29  0.60( 0.60) 1.00   10538.0   10100.00
    TOTAL AREA(ACRES) =    10538.0

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S7.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       25.12   84.96  0.60( 0.60) 1.00    1868.9   10710.00
      2       10.31  112.06  0.60( 0.60) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =     1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       25.12   84.96  0.60( 0.60) 1.00    1868.9   10710.00
      2       10.31  112.06  0.60( 0.60) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =      1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
     1       25.12   84.96    0.397  0.60( 0.60) 1.00    1868.9   10710.00
     2       10.31  112.06    0.355  0.60( 0.60) 0.99    1964.5   10700.00
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      145.76   26.22    0.678  0.60( 0.60) 1.00    1721.2   10630.00
      2      113.80   54.71    0.462  0.60( 0.60) 1.00    3584.1   10600.00
      3      131.87   74.46    0.417  0.60( 0.60) 1.00    5035.2   10500.00
      4      135.48   92.30    0.384  0.60( 0.60) 1.00    6238.9   10410.00
      5      142.88  129.58    0.336  0.60( 0.60) 1.00    8398.5   10200.00
      6      142.85  129.84    0.336  0.60( 0.60) 1.00    8411.6   10400.00
      7      141.32  147.04    0.321  0.60( 0.60) 1.00    9141.7   10320.00
      8      140.17  151.66    0.317  0.60( 0.60) 1.00    9288.8   10300.00
      9      134.22  168.63    0.303  0.60( 0.60) 1.00    9559.2   10210.00
     10      112.94  275.29    0.257  0.60( 0.60) 1.00   10538.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      159.02   26.22    0.678  0.60( 0.60) 1.00    2298.1   10630.00
      2      132.66   54.71    0.462  0.60( 0.60) 1.00    4787.6   10600.00
      3      155.02   74.46    0.417  0.60( 0.60) 1.00    6673.2   10500.00
      4      159.12   84.96    0.397  0.60( 0.60) 1.00    7612.1   10710.00
      5      156.59   92.30    0.384  0.60( 0.60) 1.00    8133.7   10410.00
      6      149.71  112.06    0.355  0.60( 0.60) 1.00    9348.0   10700.00
      7      152.62  129.58    0.336  0.60( 0.60) 1.00   10363.0   10200.00
      8      152.59  129.84    0.336  0.60( 0.60) 1.00   10376.1   10400.00
      9      150.64  147.04    0.321  0.60( 0.60) 1.00   11106.2   10320.00
     10      149.37  151.66    0.317  0.60( 0.60) 1.00   11253.2   10300.00
     11      143.00  168.63    0.303  0.60( 0.60) 1.00   11523.6   10210.00
     12      120.40  275.29    0.257  0.60( 0.60) 1.00   12502.4   10100.00
    TOTAL AREA(ACRES) =     12502.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      159.12  Tc(MIN.) =   84.957
  EFFECTIVE AREA(ACRES) =   7612.15  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12502.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10724.00 TO NODE  10820.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1320.32  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1341.06   CHANNEL SLOPE =  0.0231
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.388
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.66      0.60     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     159.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.01
  AVERAGE FLOW DEPTH(FEET) =   3.25   TRAVEL TIME(MIN.) =   4.46
  Tc(MIN.) =   89.42
  SUBAREA AREA(ACRES) =    47.66       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   7659.81     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    12550.1         PEAK FLOW RATE(CFS) =     159.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.25   FLOW VELOCITY(FEET/SEC.) =   5.01
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      159.02   30.68    0.611  0.60( 0.60) 1.00    2345.8   10630.00
      2      132.66   59.36    0.447  0.60( 0.60) 1.00    4835.3   10600.00
      3      155.02   78.94    0.408  0.60( 0.60) 1.00    6720.9   10500.00
      4      159.12   89.42    0.388  0.60( 0.60) 1.00    7659.8   10710.00
      5      156.59   96.77    0.377  0.60( 0.60) 1.00    8181.4   10410.00
      6      149.71  116.58    0.349  0.60( 0.60) 1.00    9395.6   10700.00
      7      152.62  134.08    0.332  0.60( 0.60) 1.00   10410.6   10200.00
      8      152.59  134.34    0.332  0.60( 0.60) 1.00   10423.7   10400.00
      9      150.64  151.55    0.317  0.60( 0.60) 1.00   11153.9   10320.00
     10      149.37  156.19    0.313  0.60( 0.60) 1.00   11300.9   10300.00
     11      143.00  173.20    0.299  0.60( 0.60) 1.00   11571.3   10210.00
     12      120.40  280.06    0.255  0.60( 0.60) 1.00   12550.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       34.61   16.39    0.972  0.60( 0.60) 1.00     103.4   10800.00
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      193.63   16.39    0.972  0.60( 0.60) 1.00    1356.3   10800.00
      2      160.09   30.68    0.611  0.60( 0.60) 1.00    2449.2   10630.00
      3      132.66   59.36    0.447  0.60( 0.60) 1.00    4938.7   10600.00
      4      155.02   78.94    0.408  0.60( 0.60) 1.00    6824.2   10500.00
      5      159.12   89.42    0.388  0.60( 0.60) 1.00    7763.2   10710.00
      6      156.59   96.77    0.377  0.60( 0.60) 1.00    8284.8   10410.00
```

```
      7      149.71  116.58    0.349  0.60( 0.60) 1.00    9499.0   10700.00
      8      152.62  134.08    0.332  0.60( 0.60) 1.00   10514.0   10200.00
      9      152.59  134.34    0.332  0.60( 0.60) 1.00   10527.1   10400.00
     10      150.64  151.55    0.317  0.60( 0.60) 1.00   11257.2   10320.00
     11      149.37  156.19    0.313  0.60( 0.60) 1.00   11404.3   10300.00
     12      143.00  173.20    0.299  0.60( 0.60) 1.00   11674.7   10210.00
     13      120.40  280.06    0.255  0.60( 0.60) 1.00   12653.5   10100.00
    TOTAL AREA(ACRES) =     12653.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      193.63  Tc(MIN.) =   16.386
  EFFECTIVE AREA(ACRES) =   1356.28  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12653.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1289.38  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2450.84   CHANNEL SLOPE =  0.0332
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.746
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.19      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     203.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.12
  AVERAGE FLOW DEPTH(FEET) =   3.33   TRAVEL TIME(MIN.) =   6.68
  Tc(MIN.) =   23.06
  SUBAREA AREA(ACRES) =   147.19       SUBAREA RUNOFF(CFS) =   19.41
  EFFECTIVE AREA(ACRES) =   1503.47     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12800.7         PEAK FLOW RATE(CFS) =     199.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.31   FLOW VELOCITY(FEET/SEC.) =   6.08
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.06
  RAINFALL INTENSITY(INCH/HR) =   0.75
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
```



```
  EFFECTIVE STREAM AREA(ACRES) =    1503.47
  TOTAL STREAM AREA(ACRES) =   12800.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     199.28

****************************************************************************
  FLOW PROCESS FROM NODE  10830.00 TO NODE  10831.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.89
  ELEVATION DATA: UPSTREAM(FEET) =   3249.56  DOWNSTREAM(FEET) =   3166.67

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.939
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.532
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.88      0.60     1.000     0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.74
  TOTAL AREA(ACRES) =      0.88   PEAK FLOW RATE(CFS) =      0.74

****************************************************************************
  FLOW PROCESS FROM NODE  10831.00 TO NODE  10832.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3166.67  DOWNSTREAM(FEET) =   2954.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.65   CHANNEL SLOPE =  0.3126
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.270
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        2.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.22
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   11.62
  SUBAREA AREA(ACRES) =     2.82       SUBAREA RUNOFF(CFS) =    1.70
  EFFECTIVE AREA(ACRES) =      3.70     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =       2.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   4.61
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10832.00 =     977.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10832.00 TO NODE  10833.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2954.84  DOWNSTREAM(FEET) =   2765.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.35   CHANNEL SLOPE =  0.1995
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.062
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       29.25      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.42
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   2.92
  Tc(MIN.) =   14.54
  SUBAREA AREA(ACRES) =    29.25       SUBAREA RUNOFF(CFS) =   12.16
  EFFECTIVE AREA(ACRES) =     32.95     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      13.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   6.10
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10833.00 =    1928.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10833.00 TO NODE  10834.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2765.08  DOWNSTREAM(FEET) =   2446.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.29   CHANNEL SLOPE =  0.1628
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.840
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.66      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.45
  AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   5.06
  Tc(MIN.) =   19.60
  SUBAREA AREA(ACRES) =    80.66       SUBAREA RUNOFF(CFS) =   17.40
  EFFECTIVE AREA(ACRES) =    113.61     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.6         PEAK FLOW RATE(CFS) =      24.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   6.55
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10834.00 =    3888.18 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10834.00 TO NODE  10835.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2446.09  DOWNSTREAM(FEET) =   1797.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2083.04   CHANNEL SLOPE =  0.3113
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.740
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      196.68      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.29
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   23.33
  SUBAREA AREA(ACRES) =   196.68       SUBAREA RUNOFF(CFS) =   24.74
  EFFECTIVE AREA(ACRES) =    310.29     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      310.3         PEAK FLOW RATE(CFS) =      39.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.18   FLOW VELOCITY(FEET/SEC.) =   9.38
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10835.00 =    5971.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1797.70  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3213.25   CHANNEL SLOPE =  0.1835
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.615
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      218.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.81
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   6.86
  Tc(MIN.) =   30.20
  SUBAREA AREA(ACRES) =   218.82       SUBAREA RUNOFF(CFS) =    3.06
  EFFECTIVE AREA(ACRES) =    529.11     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      529.1         PEAK FLOW RATE(CFS) =      39.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =   7.68
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10840.00 =    9184.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.20
  RAINFALL INTENSITY(INCH/HR) =   0.62
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     529.11
  TOTAL STREAM AREA(ACRES) =     529.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      39.03

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      199.28   23.06    0.746  0.60( 0.60) 1.00    1503.5   10800.00
      1      160.09   37.76    0.553  0.60( 0.60) 1.00    2596.3   10630.00
      1      132.66   66.79    0.432  0.60( 0.60) 1.00    5085.8   10600.00
      1      155.02   86.09    0.395  0.60( 0.60) 1.00    6971.4   10500.00
      1      159.12   96.50    0.378  0.60( 0.60) 1.00    7910.4   10710.00
      1      156.59  103.90    0.367  0.60( 0.60) 1.00    8431.9   10410.00
      1      149.71  123.78    0.341  0.60( 0.60) 1.00    9646.2   10700.00
      1      152.62  141.25    0.326  0.60( 0.60) 1.00   10661.2   10200.00
      1      152.59  141.51    0.326  0.60( 0.60) 1.00   10674.3   10400.00
      1      150.64  158.74    0.311  0.60( 0.60) 1.00   11404.4   10320.00
      1      149.37  163.41    0.307  0.60( 0.60) 1.00   11551.5   10300.00
      1      143.00  180.50    0.293  0.60( 0.60) 1.00   11821.9   10210.00
      1      120.40  287.67    0.252  0.60( 0.60) 1.00   12800.7   10100.00
      2       39.03   30.20    0.615  0.60( 0.60) 1.00     529.1   10830.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      238.32   23.06    0.746  0.60( 0.60) 1.00    1907.6   10800.00
      2      219.30   30.20    0.615  0.60( 0.60) 1.00    2562.9   10830.00
      3      160.09   37.76    0.553  0.60( 0.60) 1.00    3125.5   10630.00
      4      132.66   66.79    0.432  0.60( 0.60) 1.00    5615.0   10600.00
      5      155.02   86.09    0.395  0.60( 0.60) 1.00    7500.5   10500.00
      6      159.12   96.50    0.378  0.60( 0.60) 1.00    8439.5   10710.00
      7      156.59  103.90    0.367  0.60( 0.60) 1.00    8961.1   10410.00
      8      149.71  123.78    0.341  0.60( 0.60) 1.00   10175.3   10700.00
      9      152.62  141.25    0.326  0.60( 0.60) 1.00   11190.3   10200.00
     10      152.59  141.51    0.326  0.60( 0.60) 1.00   11203.4   10400.00
     11      150.64  158.74    0.311  0.60( 0.60) 1.00   11933.5   10320.00
     12      149.36  163.41    0.307  0.60( 0.60) 1.00   12080.6   10300.00
     13      143.00  180.50    0.293  0.60( 0.60) 1.00   12351.0   10210.00
     14      120.39  287.67    0.252  0.60( 0.60) 1.00   13329.8   10100.00
```



```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     238.32    Tc(MIN.) =    23.06
  EFFECTIVE AREA(ACRES) =    1907.63   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    13329.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10840.00 TO NODE  10841.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1208.07  DOWNSTREAM(FEET) =   1119.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3050.12   CHANNEL SLOPE =  0.0292
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.605
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      222.84      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     238.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.07
  AVERAGE FLOW DEPTH(FEET) =   3.62   TRAVEL TIME(MIN.) =   8.37
  Tc(MIN.) =   31.43
  SUBAREA AREA(ACRES) =   222.84       SUBAREA RUNOFF(CFS) =    1.05
  EFFECTIVE AREA(ACRES) =   2130.47     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13552.6         PEAK FLOW RATE(CFS) =     238.32
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.62   FLOW VELOCITY(FEET/SEC.) =   6.06
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10841.00 =   52177.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1119.03  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.14   CHANNEL SLOPE =  0.0238
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.573
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      265.26      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     238.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.62
  AVERAGE FLOW DEPTH(FEET) =   3.76   TRAVEL TIME(MIN.) =   3.91
  Tc(MIN.) =   35.34
  SUBAREA AREA(ACRES) =   265.26       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2395.73     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    13817.9         PEAK FLOW RATE(CFS) =     238.32
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.76   FLOW VELOCITY(FEET/SEC.) =   5.62
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   35.34
  RAINFALL INTENSITY(INCH/HR) =   0.57
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2395.73
  TOTAL STREAM AREA(ACRES) =   13817.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     238.32

****************************************************************************
  FLOW PROCESS FROM NODE  10850.00 TO NODE  10851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   311.88
  ELEVATION DATA: UPSTREAM(FEET) =   3029.66  DOWNSTREAM(FEET) =   2922.38

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.691
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.566
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.73      0.60     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.37
  TOTAL AREA(ACRES) =      2.73   PEAK FLOW RATE(CFS) =      2.37

****************************************************************************
  FLOW PROCESS FROM NODE  10851.00 TO NODE  10852.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2922.38  DOWNSTREAM(FEET) =   2684.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =   687.05   CHANNEL SLOPE =  0.3461
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.332
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        5.11      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.58
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   2.05
  Tc(MIN.) =   10.74
  SUBAREA AREA(ACRES) =     5.11       SUBAREA RUNOFF(CFS) =    3.37
  EFFECTIVE AREA(ACRES) =      7.84     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =       5.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   5.93
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10852.00 =     998.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10852.00 TO NODE  10853.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2684.61  DOWNSTREAM(FEET) =   2306.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.58   CHANNEL SLOPE =  0.1966
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.997
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       60.02      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.36
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   5.04
  Tc(MIN.) =   15.79
  SUBAREA AREA(ACRES) =    60.02       SUBAREA RUNOFF(CFS) =   21.43
  EFFECTIVE AREA(ACRES) =     67.86     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =      24.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =   7.02
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10853.00 =    2923.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10853.00 TO NODE  10854.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2306.25  DOWNSTREAM(FEET) =   1555.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3225.53   CHANNEL SLOPE =  0.2329
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.774
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      235.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.71
  AVERAGE FLOW DEPTH(FEET) =   1.30   TRAVEL TIME(MIN.) =   6.17
  Tc(MIN.) =   21.96
  SUBAREA AREA(ACRES) =   235.82       SUBAREA RUNOFF(CFS) =   36.94
  EFFECTIVE AREA(ACRES) =    303.68     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.7         PEAK FLOW RATE(CFS) =      47.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.34   FLOW VELOCITY(FEET/SEC.) =   8.83
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10854.00 =    6149.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1555.12  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3294.22   CHANNEL SLOPE =  0.1419
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.628
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      247.64      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.48
  AVERAGE FLOW DEPTH(FEET) =   1.52   TRAVEL TIME(MIN.) =   7.34
  Tc(MIN.) =   29.30
  SUBAREA AREA(ACRES) =   247.64       SUBAREA RUNOFF(CFS) =    6.34
  EFFECTIVE AREA(ACRES) =    551.32     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      551.3         PEAK FLOW RATE(CFS) =      47.57
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.47   FLOW VELOCITY(FEET/SEC.) =   7.34
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10860.00 =    9443.26 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.30
  RAINFALL INTENSITY(INCH/HR) =   0.63
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     551.32
  TOTAL STREAM AREA(ACRES) =     551.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      47.57

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      238.32   35.34    0.573  0.60( 0.60) 1.00    2395.7   10800.00
      1      219.30   42.74    0.519  0.60( 0.60) 1.00    3051.0   10830.00
      1      160.09   51.34    0.474  0.60( 0.60) 1.00    3613.6   10630.00
      1      132.66   81.01    0.404  0.60( 0.60) 1.00    6103.1   10600.00
      1      155.02   99.78    0.373  0.60( 0.60) 1.00    7988.6   10500.00
      1      159.12  110.10    0.358  0.60( 0.60) 1.00    8927.6   10710.00
      1      156.59  117.57    0.347  0.60( 0.60) 1.00    9449.2   10410.00
      1      149.71  137.59    0.329  0.60( 0.60) 1.00   10663.4   10700.00
      1      152.62  155.00    0.314  0.60( 0.60) 1.00   11678.4   10200.00
      1      152.59  155.26    0.314  0.60( 0.60) 1.00   11691.5   10400.00
      1      150.64  172.53    0.299  0.60( 0.60) 1.00   12421.6   10320.00
      1      149.36  177.23    0.295  0.60( 0.60) 1.00   12568.7   10300.00
      1      143.00  194.47    0.288  0.60( 0.60) 1.00   12839.1   10210.00
      1      120.39  302.27    0.247  0.60( 0.60) 1.00   13817.9   10100.00
      2       47.57   29.30    0.628  0.60( 0.60) 1.00     551.3   10850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      264.36   29.30    0.628  0.60( 0.60) 1.00    2537.6   10850.00
      2      238.31   35.34    0.573  0.60( 0.60) 1.00    2947.0   10800.00
      3      219.30   42.74    0.519  0.60( 0.60) 1.00    3602.3   10830.00
      4      160.08   51.34    0.474  0.60( 0.60) 1.00    4164.9   10630.00
      5      132.65   81.01    0.404  0.60( 0.60) 1.00    6654.4   10600.00
      6      155.01   99.78    0.373  0.60( 0.60) 1.00    8540.0   10500.00
      7      159.11  110.10    0.358  0.60( 0.60) 1.00    9478.9   10710.00
      8      156.59  117.57    0.347  0.60( 0.60) 1.00   10000.5   10410.00
      9      149.71  137.59    0.329  0.60( 0.60) 1.00   11214.7   10700.00
     10      152.62  155.00    0.314  0.60( 0.60) 1.00   12229.7   10200.00
     11      152.59  155.26    0.314  0.60( 0.60) 1.00   12242.8   10400.00
     12      150.64  172.53    0.299  0.60( 0.60) 1.00   12973.0   10320.00
     13      149.36  177.23    0.295  0.60( 0.60) 1.00   13120.0   10300.00
     14      143.00  194.47    0.288  0.60( 0.60) 1.00   13390.4   10210.00
     15      120.39  302.27    0.247  0.60( 0.60) 1.00   14369.2   10100.00
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     264.36    Tc(MIN.) =    29.30
  EFFECTIVE AREA(ACRES) =    2537.59   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    14369.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1087.70  DOWNSTREAM(FEET) =    961.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4791.22   CHANNEL SLOPE =  0.0264
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.519
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      402.51      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     264.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.00
  AVERAGE FLOW DEPTH(FEET) =   3.83   TRAVEL TIME(MIN.) =  13.31
  Tc(MIN.) =   42.61
  SUBAREA AREA(ACRES) =   402.51       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2940.10     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    14771.7         PEAK FLOW RATE(CFS) =     264.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.83   FLOW VELOCITY(FEET/SEC.) =   6.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    14771.7  TC(MIN.) =     42.61
  EFFECTIVE AREA(ACRES) =   2940.10  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =     264.36

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      264.36   42.61    0.519  0.60( 0.60) 1.00    2940.1   10850.00
      2      238.31   49.01    0.484  0.60( 0.60) 1.00    3349.6   10800.00
      3      219.30   56.69    0.456  0.60( 0.60) 1.00    4004.9   10830.00
      4      160.08   66.44    0.433  0.60( 0.60) 1.00    4567.4   10630.00
      5      132.65   96.80    0.377  0.60( 0.60) 1.00    7056.9   10600.00
      6      155.01  115.00    0.351  0.60( 0.60) 1.00    8942.5   10500.00
```



```
      7      159.11  125.22    0.340  0.60( 0.60) 1.00    9881.4   10710.00
      8      156.59  132.73    0.333  0.60( 0.60) 1.00   10403.0   10410.00
      9      149.71  152.91    0.316  0.60( 0.60) 1.00   11617.2   10700.00
     10      152.62  170.25    0.301  0.60( 0.60) 1.00   12632.2   10200.00
     11      152.59  170.52    0.301  0.60( 0.60) 1.00   12645.3   10400.00
     12      150.64  187.84    0.290  0.60( 0.60) 1.00   13375.5   10320.00
     13      149.36  192.59    0.288  0.60( 0.60) 1.00   13522.5   10300.00
     14      143.00  209.97    0.282  0.60( 0.60) 1.00   13792.9   10210.00
     15      120.39  318.50    0.241  0.60( 0.60) 1.00   14771.7   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S9.DAT
  TIME/DATE OF STUDY: 10:40 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.077
   2)   10.00;  1.385
   3)   15.00;  1.029
   4)   20.00;  0.823
   5)   25.00;  0.698
   6)   30.00;  0.617
   7)   40.00;  0.534
   8)   50.00;  0.478
   9)   60.00;  0.445
  10)   90.00;  0.387
  11)  120.00;  0.344
  12)  180.00;  0.293
  13)  360.00;  0.225
  14) 1440.00;  0.102
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10900.00 TO NODE  10901.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   305.17
  ELEVATION DATA: UPSTREAM(FEET) =   3291.76  DOWNSTREAM(FEET) =   3104.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.671
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.707
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        1.19      0.60     1.000     0    7.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.19
  TOTAL AREA(ACRES) =      1.19   PEAK FLOW RATE(CFS) =      1.19

**************************************************************************
  FLOW PROCESS FROM NODE  10901.00 TO NODE  10902.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3104.08  DOWNSTREAM(FEET) =   2877.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   666.71   CHANNEL SLOPE =  0.3398
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.381
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        2.53      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.66
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   2.38
  Tc(MIN.) =   10.05
  SUBAREA AREA(ACRES) =     2.53       SUBAREA RUNOFF(CFS) =    1.78
  EFFECTIVE AREA(ACRES) =      3.72     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =       2.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   4.89
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10902.00 =     971.88 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10902.00 TO NODE  10903.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2877.50  DOWNSTREAM(FEET) =   2643.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.39   CHANNEL SLOPE =  0.1219
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.944
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.43      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.56
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   7.00
  Tc(MIN.) =   17.05
  SUBAREA AREA(ACRES) =    36.43       SUBAREA RUNOFF(CFS) =   11.30
  EFFECTIVE AREA(ACRES) =     40.15     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.2         PEAK FLOW RATE(CFS) =      12.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   4.98
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10903.00 =    2888.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10903.00 TO NODE  10904.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2643.95  DOWNSTREAM(FEET) =   2373.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.90   CHANNEL SLOPE =  0.1400
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.764
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.07      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.05
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   5.32
  Tc(MIN.) =   22.37
  SUBAREA AREA(ACRES) =   129.07       SUBAREA RUNOFF(CFS) =   19.03
  EFFECTIVE AREA(ACRES) =    169.22     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      169.2         PEAK FLOW RATE(CFS) =      24.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.16   FLOW VELOCITY(FEET/SEC.) =   6.21
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10904.00 =    4820.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10904.00 TO NODE  10905.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2373.49  DOWNSTREAM(FEET) =   1817.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2764.66   CHANNEL SLOPE =  0.2010
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.638
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.70      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.28
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   6.33
  Tc(MIN.) =   28.70
  SUBAREA AREA(ACRES) =   117.70       SUBAREA RUNOFF(CFS) =    4.05
  EFFECTIVE AREA(ACRES) =    286.92     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.9         PEAK FLOW RATE(CFS) =      24.95
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   7.12
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10905.00 =    7584.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10905.00 TO NODE  10906.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1817.76  DOWNSTREAM(FEET) =   1387.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2799.36   CHANNEL SLOPE =  0.1536
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.567
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      363.93      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.40
  AVERAGE FLOW DEPTH(FEET) =   1.14   TRAVEL TIME(MIN.) =   7.29
  Tc(MIN.) =   35.99
  SUBAREA AREA(ACRES) =   363.93       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    650.85     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      650.8         PEAK FLOW RATE(CFS) =      24.95
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.14   FLOW VELOCITY(FEET/SEC.) =   6.40
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10906.00 =   10384.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1387.73  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2484.63   CHANNEL SLOPE =  0.1103
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.516
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.85      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.68
  AVERAGE FLOW DEPTH(FEET) =   1.21   TRAVEL TIME(MIN.) =   7.29
  Tc(MIN.) =   43.28
  SUBAREA AREA(ACRES) =    56.85       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    707.70     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      707.7         PEAK FLOW RATE(CFS) =      24.95
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.21   FLOW VELOCITY(FEET/SEC.) =   5.68
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10920.00 =   12868.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   43.28
  RAINFALL INTENSITY(INCH/HR) =   0.52
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     707.70
  TOTAL STREAM AREA(ACRES) =     707.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      24.95

****************************************************************************
  FLOW PROCESS FROM NODE  10910.00 TO NODE  10911.00 IS CODE =  21
----------------------------------------------------------------------------
```



```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   287.29
  ELEVATION DATA: UPSTREAM(FEET) =   3119.43  DOWNSTREAM(FEET) =   3044.59

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.891
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.538
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.91      0.60     1.000     0    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.61
  TOTAL AREA(ACRES) =      1.91   PEAK FLOW RATE(CFS) =      1.61

****************************************************************************
  FLOW PROCESS FROM NODE  10911.00 TO NODE  10912.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3044.59  DOWNSTREAM(FEET) =   2980.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.50   CHANNEL SLOPE =  0.1015
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.228
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.16      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.16
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   12.20
  SUBAREA AREA(ACRES) =     4.16       SUBAREA RUNOFF(CFS) =    2.35
  EFFECTIVE AREA(ACRES) =      6.07     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =       3.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   3.35
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10912.00 =     914.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10912.00 TO NODE  10913.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2980.93  DOWNSTREAM(FEET) =   2876.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =   984.99   CHANNEL SLOPE =  0.1065
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```

```
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.981
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.86      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.14
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   16.16
  SUBAREA AREA(ACRES) =    22.86       SUBAREA RUNOFF(CFS) =    7.84
  EFFECTIVE AREA(ACRES) =     28.93     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.9         PEAK FLOW RATE(CFS) =       9.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   4.48
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10913.00 =    1899.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10913.00 TO NODE  10914.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2876.01  DOWNSTREAM(FEET) =   2832.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   939.99   CHANNEL SLOPE =  0.0465
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.811
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.02      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.63
  AVERAGE FLOW DEPTH(FEET) =   1.18   TRAVEL TIME(MIN.) =   4.32
  Tc(MIN.) =   20.48
  SUBAREA AREA(ACRES) =    53.02       SUBAREA RUNOFF(CFS) =   10.08
  EFFECTIVE AREA(ACRES) =     81.95     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       81.9         PEAK FLOW RATE(CFS) =      15.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   3.65
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10914.00 =    2839.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10914.00 TO NODE  10915.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2832.29  DOWNSTREAM(FEET) =   2769.58
```



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  CHANNEL LENGTH THRU SUBAREA(FEET) =  1006.52   CHANNEL SLOPE =  0.0623
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.715
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.80      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.37
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   3.84
  Tc(MIN.) =   24.32
  SUBAREA AREA(ACRES) =    90.80       SUBAREA RUNOFF(CFS) =    9.41
  EFFECTIVE AREA(ACRES) =    172.75     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      172.8         PEAK FLOW RATE(CFS) =      17.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   4.23
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10915.00 =    3846.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10915.00 TO NODE  10916.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2769.58  DOWNSTREAM(FEET) =   2453.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3003.36   CHANNEL SLOPE =  0.1053
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.583
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      311.96      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.13
  AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   9.76
  Tc(MIN.) =   34.07
  SUBAREA AREA(ACRES) =   311.96       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    484.71     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      484.7         PEAK FLOW RATE(CFS) =      17.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   5.13
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10916.00 =    6849.65 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  10916.00 TO NODE  10917.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.21  DOWNSTREAM(FEET) =   1787.18
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2846.14   CHANNEL SLOPE =  0.2340
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.529
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.62      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.93
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   6.84
  Tc(MIN.) =   40.92
  SUBAREA AREA(ACRES) =   238.62       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    723.33     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      723.3         PEAK FLOW RATE(CFS) =      17.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   6.93
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10917.00 =    9695.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10917.00 TO NODE  10918.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1787.18  DOWNSTREAM(FEET) =   1279.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2918.23   CHANNEL SLOPE =  0.1741
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.485
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      150.63      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.20
  AVERAGE FLOW DEPTH(FEET) =   0.98   TRAVEL TIME(MIN.) =   7.85
  Tc(MIN.) =   48.76
```



```
  SUBAREA AREA(ACRES) =   150.63       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    873.96     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      874.0         PEAK FLOW RATE(CFS) =      17.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =   6.20
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10918.00 =   12614.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1279.22  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.50   CHANNEL SLOPE =  0.0995
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.464
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.16      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.04
  AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   5.50
  Tc(MIN.) =   54.27
  SUBAREA AREA(ACRES) =    60.16       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    934.12     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      934.1         PEAK FLOW RATE(CFS) =      17.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.09   FLOW VELOCITY(FEET/SEC.) =   5.04
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   54.27
  RAINFALL INTENSITY(INCH/HR) =   0.46
  AREA-AVERAGED Fm(INCH/HR) =  0.60
```

```
 AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     934.12
 TOTAL STREAM AREA(ACRES) =     934.12
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      17.91

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       24.95   43.28    0.516  0.60( 0.60) 1.00     707.7   10900.00
     2       17.91   54.27    0.464  0.60( 0.60) 1.00     934.1   10910.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       40.82   43.28    0.516  0.60( 0.60) 1.00    1452.7   10900.00
     2       40.35   54.27    0.464  0.60( 0.60) 1.00    1641.8   10910.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      40.82    Tc(MIN.) =    43.28
 EFFECTIVE AREA(ACRES) =    1452.73   AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1641.8
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1113.60  DOWNSTREAM(FEET) =    961.06
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2282.16   CHANNEL SLOPE =  0.0668
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.477
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      185.67      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.82
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.32
 AVERAGE FLOW DEPTH(FEET) =   1.60   TRAVEL TIME(MIN.) =   7.15
 Tc(MIN.) =   50.43
 SUBAREA AREA(ACRES) =   185.67       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   1638.40     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1827.5         PEAK FLOW RATE(CFS) =      40.82
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```



```
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.60   FLOW VELOCITY(FEET/SEC.) =   5.32
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10921.00 =   16560.68 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1827.5  TC(MIN.) =     50.43
 EFFECTIVE AREA(ACRES) =   1638.40  AREA-AVERAGED Fm(INCH/HR)=  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =      40.82

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       40.82   50.43    0.477  0.60( 0.60) 1.00    1638.4   10900.00
     2       40.35   61.43    0.442  0.60( 0.60) 1.00    1827.5   10910.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S10.DAT
  TIME/DATE OF STUDY: 10:40 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.036
   2)   10.00;  1.358
   3)   15.00;  1.014
   4)   20.00;  0.814
   5)   25.00;  0.693
   6)   30.00;  0.612
   7)   40.00;  0.530
   8)   50.00;  0.473
   9)   60.00;  0.439
  10)   90.00;  0.380
  11)  120.00;  0.337
  12)  180.00;  0.286
  13)  360.00;  0.218
  14) 1440.00;  0.098
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11000.00 TO NODE  11001.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   362.38
  ELEVATION DATA: UPSTREAM(FEET) =   2528.19  DOWNSTREAM(FEET) =   2375.55

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.863
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.512
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        2.03      0.60     1.000     0    8.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.67
  TOTAL AREA(ACRES) =      2.03   PEAK FLOW RATE(CFS) =      1.67

************************************************************************
  FLOW PROCESS FROM NODE  11001.00 TO NODE  11002.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2375.55  DOWNSTREAM(FEET) =   2005.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.45   CHANNEL SLOPE =  0.6438
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.331
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        3.14      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.29
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   1.53
  Tc(MIN.) =   10.39
  SUBAREA AREA(ACRES) =     3.14       SUBAREA RUNOFF(CFS) =    2.07
  EFFECTIVE AREA(ACRES) =      5.17     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2         PEAK FLOW RATE(CFS) =       3.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =   6.78
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11002.00 =     937.83 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11002.00 TO NODE  11003.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2005.09  DOWNSTREAM(FEET) =   1450.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.43   CHANNEL SLOPE =  0.5763
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.192
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.53      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.90
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   2.03
  Tc(MIN.) =   12.42
  SUBAREA AREA(ACRES) =    16.53       SUBAREA RUNOFF(CFS) =    8.80
  EFFECTIVE AREA(ACRES) =     21.70     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.7         PEAK FLOW RATE(CFS) =      11.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   8.67
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11003.00 =    1900.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.44  DOWNSTREAM(FEET) =    939.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1351.71   CHANNEL SLOPE =  0.3779
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.008
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.99      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   15.15
  SUBAREA AREA(ACRES) =    30.99       SUBAREA RUNOFF(CFS) =   11.38
  EFFECTIVE AREA(ACRES) =     52.69     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       52.7         PEAK FLOW RATE(CFS) =      19.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   8.47
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```



```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S8.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      264.36   42.61  0.60( 0.60) 1.00    2940.1   10850.00
      2      238.31   49.01  0.60( 0.60) 1.00    3349.6   10800.00
      3      219.30   56.69  0.60( 0.60) 1.00    4004.9   10830.00
      4      160.08   66.44  0.60( 0.60) 1.00    4567.4   10630.00
      5      132.65   96.80  0.60( 0.60) 1.00    7056.9   10600.00
      6      155.01  115.00  0.60( 0.60) 1.00    8942.5   10500.00
      7      159.11  125.22  0.60( 0.60) 1.00    9881.4   10710.00
      8      156.59  132.73  0.60( 0.60) 1.00   10403.0   10410.00
      9      149.71  152.91  0.60( 0.60) 1.00   11617.2   10700.00
     10      152.62  170.25  0.60( 0.60) 1.00   12632.2   10200.00
     11      152.59  170.52  0.60( 0.60) 1.00   12645.3   10400.00
     12      150.64  187.84  0.60( 0.60) 1.00   13375.5   10320.00
     13      149.36  192.59  0.60( 0.60) 1.00   13522.5   10300.00
     14      143.00  209.97  0.60( 0.60) 1.00   13792.9   10210.00
     15      120.39  318.50  0.60( 0.60) 1.00   14771.7   10100.00
    TOTAL AREA(ACRES) =    14771.7

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S9.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       40.82   50.43  0.60( 0.60) 1.00    1638.4   10900.00
      2       40.35   61.43  0.60( 0.60) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =     1827.5

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       40.82   50.43  0.60( 0.60) 1.00    1638.4   10900.00
      2       40.35   61.43  0.60( 0.60) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =      1827.5

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
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================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       40.82   50.43    0.472  0.60( 0.60) 1.00    1638.4   10900.00
      2       40.35   61.43    0.436  0.60( 0.60) 1.00    1827.5   10910.00
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10921.00 =   16560.68 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      264.36   42.61    0.515  0.60( 0.60) 1.00    2940.1   10850.00
      2      238.31   49.01    0.479  0.60( 0.60) 1.00    3349.6   10800.00
      3      219.30   56.69    0.450  0.60( 0.60) 1.00    4004.9   10830.00
      4      160.08   66.44    0.426  0.60( 0.60) 1.00    4567.4   10630.00
      5      132.65   96.80    0.370  0.60( 0.60) 1.00    7056.9   10600.00
      6      155.01  115.00    0.344  0.60( 0.60) 1.00    8942.5   10500.00
      7      159.11  125.22    0.333  0.60( 0.60) 1.00    9881.4   10710.00
      8      156.59  132.73    0.326  0.60( 0.60) 1.00   10403.0   10410.00
      9      149.71  152.91    0.309  0.60( 0.60) 1.00   11617.2   10700.00
     10      152.62  170.25    0.294  0.60( 0.60) 1.00   12632.2   10200.00
     11      152.59  170.52    0.294  0.60( 0.60) 1.00   12645.3   10400.00
     12      150.64  187.84    0.283  0.60( 0.60) 1.00   13375.5   10320.00
     13      149.36  192.59    0.281  0.60( 0.60) 1.00   13522.5   10300.00
     14      143.00  209.97    0.275  0.60( 0.60) 1.00   13792.9   10210.00
     15      120.39  318.50    0.234  0.60( 0.60) 1.00   14771.7   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      302.04   42.61    0.515  0.60( 0.60) 1.00    4324.5   10850.00
      2      278.58   49.01    0.479  0.60( 0.60) 1.00    4941.9   10800.00
      3      275.62   50.43    0.472  0.60( 0.60) 1.00    5109.1   10900.00
      4      259.85   56.69    0.450  0.60( 0.60) 1.00    5750.8   10830.00
      5      230.85   61.43    0.436  0.60( 0.60) 1.00    6105.9   10910.00
      6      199.52   66.44    0.426  0.60( 0.60) 1.00    6394.9   10630.00
      7      166.91   96.80    0.370  0.60( 0.60) 1.00    8884.4   10600.00
      8      186.85  115.00    0.344  0.60( 0.60) 1.00   10770.0   10500.00
      9      189.88  125.22    0.333  0.60( 0.60) 1.00   11708.9   10710.00
     10      186.76  132.73    0.326  0.60( 0.60) 1.00   12230.5   10410.00
     11      178.30  152.91    0.309  0.60( 0.60) 1.00   13444.7   10700.00
     12      179.84  170.25    0.294  0.60( 0.60) 1.00   14459.7   10200.00
     13      179.79  170.52    0.294  0.60( 0.60) 1.00   14472.8   10400.00
     14      176.82  187.84    0.283  0.60( 0.60) 1.00   15203.0   10320.00
     15      175.38  192.59    0.281  0.60( 0.60) 1.00   15350.0   10300.00
     16      168.41  209.97    0.275  0.60( 0.60) 1.00   15620.4   10210.00
     17      142.01  318.50    0.234  0.60( 0.60) 1.00   16599.2   10100.00
    TOTAL AREA(ACRES) =     16599.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      302.04  Tc(MIN.) =   42.613
  EFFECTIVE AREA(ACRES) =   4324.50  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    16599.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.
```



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================================================================================
  FLOW PROCESS FROM NODE  10921.00 TO NODE  11020.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    961.06  DOWNSTREAM(FEET) =    939.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =   601.65   CHANNEL SLOPE =  0.0356
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.508
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.29      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     302.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.95
  AVERAGE FLOW DEPTH(FEET) =   3.56   TRAVEL TIME(MIN.) =   1.26
  Tc(MIN.) =   43.87
  SUBAREA AREA(ACRES) =    18.29       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   4342.79     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    16617.5         PEAK FLOW RATE(CFS) =     302.04
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.56   FLOW VELOCITY(FEET/SEC.) =   7.95
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

================================================================================
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      302.04   43.87    0.508  0.60( 0.60) 1.00    4342.8   10850.00
      2      278.58   50.30    0.472  0.60( 0.60) 1.00    4960.1   10800.00
      3      275.62   51.72    0.467  0.60( 0.60) 1.00    5127.4   10900.00
      4      259.85   58.00    0.446  0.60( 0.60) 1.00    5769.1   10830.00
      5      230.85   62.78    0.434  0.60( 0.60) 1.00    6124.2   10910.00
      6      199.52   67.84    0.424  0.60( 0.60) 1.00    6413.2   10630.00
      7      166.91   98.26    0.368  0.60( 0.60) 1.00    8902.7   10600.00
      8      186.85  116.43    0.342  0.60( 0.60) 1.00   10788.2   10500.00
      9      189.88  126.63    0.331  0.60( 0.60) 1.00   11727.2   10710.00
     10      186.76  134.15    0.325  0.60( 0.60) 1.00   12248.8   10410.00
     11      178.30  154.35    0.308  0.60( 0.60) 1.00   13463.0   10700.00
     12      179.84  171.69    0.293  0.60( 0.60) 1.00   14478.0   10200.00
     13      179.79  171.96    0.293  0.60( 0.60) 1.00   14491.1   10400.00
     14      176.82  189.28    0.282  0.60( 0.60) 1.00   15221.2   10320.00
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    15      175.38  194.04    0.281  0.60( 0.60) 1.00   15368.3   10300.00
    16      168.41  211.42    0.274  0.60( 0.60) 1.00   15638.7   10210.00
    17      142.01  320.02    0.233  0.60( 0.60) 1.00   16617.5   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       19.35   15.15    1.008  0.60( 0.60) 1.00      52.7   11000.00
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      226.34   15.15    1.008  0.60( 0.60) 1.00    1552.4   11000.00
      2      302.04   43.87    0.508  0.60( 0.60) 1.00    4395.5   10850.00
      3      278.58   50.30    0.472  0.60( 0.60) 1.00    5012.8   10800.00
      4      275.62   51.72    0.467  0.60( 0.60) 1.00    5180.1   10900.00
      5      259.85   58.00    0.446  0.60( 0.60) 1.00    5821.8   10830.00
      6      230.85   62.78    0.434  0.60( 0.60) 1.00    6176.9   10910.00
      7      199.52   67.84    0.424  0.60( 0.60) 1.00    6465.9   10630.00
      8      166.91   98.26    0.368  0.60( 0.60) 1.00    8955.4   10600.00
      9      186.85  116.43    0.342  0.60( 0.60) 1.00   10840.9   10500.00
     10      189.88  126.63    0.331  0.60( 0.60) 1.00   11779.9   10710.00
     11      186.76  134.15    0.325  0.60( 0.60) 1.00   12301.5   10410.00
     12      178.30  154.35    0.308  0.60( 0.60) 1.00   13515.7   10700.00
     13      179.84  171.69    0.293  0.60( 0.60) 1.00   14530.7   10200.00
     14      179.79  171.96    0.293  0.60( 0.60) 1.00   14543.8   10400.00
     15      176.82  189.28    0.282  0.60( 0.60) 1.00   15273.9   10320.00
     16      175.38  194.04    0.281  0.60( 0.60) 1.00   15421.0   10300.00
     17      168.41  211.42    0.274  0.60( 0.60) 1.00   15691.4   10210.00
     18      142.01  320.02    0.233  0.60( 0.60) 1.00   16670.2   10100.00
    TOTAL AREA(ACRES) =     16670.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      302.04  Tc(MIN.) =   43.874
  EFFECTIVE AREA(ACRES) =   4395.48  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    16670.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11020.00 TO NODE  11021.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.63  DOWNSTREAM(FEET) =    865.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2876.19   CHANNEL SLOPE =  0.0259
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.471
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.02      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
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  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     302.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.05
  AVERAGE FLOW DEPTH(FEET) =   3.78   TRAVEL TIME(MIN.) =   6.80
  Tc(MIN.) =   50.68
  SUBAREA AREA(ACRES) =   191.02       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   4586.50     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    16861.2         PEAK FLOW RATE(CFS) =     302.04
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.78   FLOW VELOCITY(FEET/SEC.) =   7.05
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11021.00 =   61764.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11021.00 TO NODE  11022.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    865.22  DOWNSTREAM(FEET) =    752.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.47   CHANNEL SLOPE =  0.0389
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.451
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.06      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     302.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.22
  AVERAGE FLOW DEPTH(FEET) =   3.50   TRAVEL TIME(MIN.) =   5.86
  Tc(MIN.) =   56.54
  SUBAREA AREA(ACRES) =   320.06       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   4906.56     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    17181.2         PEAK FLOW RATE(CFS) =     302.04
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.50   FLOW VELOCITY(FEET/SEC.) =   8.22
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11022.00 =   64657.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11022.00 TO NODE  11023.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

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==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    752.60  DOWNSTREAM(FEET) =    737.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.15   CHANNEL SLOPE =  0.0081
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.432
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      226.98      0.60     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     302.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.56
  AVERAGE FLOW DEPTH(FEET) =   4.70   TRAVEL TIME(MIN.) =   6.81
  Tc(MIN.) =   63.35
  SUBAREA AREA(ACRES) =   226.98       SUBAREA RUNOFF(CFS) =    1.24
  EFFECTIVE AREA(ACRES) =   5133.54     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    17408.2         PEAK FLOW RATE(CFS) =     302.04
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.70   FLOW VELOCITY(FEET/SEC.) =   4.56
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11023.00 =   66521.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    737.50  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2632.50   CHANNEL SLOPE =  0.0222
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.419
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.84      0.60     0.992     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     302.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.66
  AVERAGE FLOW DEPTH(FEET) =   3.89   TRAVEL TIME(MIN.) =   6.58
  Tc(MIN.) =   69.93
  SUBAREA AREA(ACRES) =   124.84       SUBAREA RUNOFF(CFS) =    0.38
  EFFECTIVE AREA(ACRES) =   5258.38     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
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  TOTAL AREA(ACRES) =    17533.1         PEAK FLOW RATE(CFS) =     302.04
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.89   FLOW VELOCITY(FEET/SEC.) =   6.67
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11363.00 =   69154.02 FEET.
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    17533.1  TC(MIN.) =     69.93
  EFFECTIVE AREA(ACRES) =   5258.38  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =     302.04

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      246.84   42.56    0.515  0.60( 0.60) 1.00    2415.3   11000.00
      2      302.04   69.93    0.419  0.60( 0.60) 1.00    5258.4   10850.00
      3      278.58   76.86    0.406  0.60( 0.60) 1.00    5875.7   10800.00
      4      275.62   78.38    0.403  0.60( 0.60) 1.00    6043.0   10900.00
      5      259.85   85.05    0.390  0.60( 0.60) 1.00    6684.7   10830.00
      6      230.85   90.63    0.379  0.60( 0.60) 1.00    7039.8   10910.00
      7      199.52   96.73    0.370  0.60( 0.60) 1.00    7328.8   10630.00
      8      166.91  128.46    0.330  0.60( 0.60) 1.00    9818.3   10600.00
      9      186.85  145.80    0.315  0.60( 0.60) 1.00   11703.8   10500.00
     10      189.88  155.90    0.306  0.60( 0.60) 1.00   12642.8   10710.00
     11      186.76  163.55    0.300  0.60( 0.60) 1.00   13164.4   10410.00
     12      178.30  184.07    0.284  0.60( 0.60) 1.00   14378.6   10700.00
     13      179.84  201.34    0.278  0.60( 0.60) 1.00   15393.6   10200.00
     14      179.79  201.61    0.278  0.60( 0.60) 1.00   15406.7   10400.00
     15      176.82  219.07    0.271  0.60( 0.60) 1.00   16136.8   10320.00
     16      175.38  223.88    0.269  0.60( 0.60) 1.00   16283.9   10300.00
     17      168.41  241.55    0.263  0.60( 0.60) 1.00   16554.3   10210.00
     18      142.01  351.47    0.221  0.60( 0.60) 1.00   17533.1   10100.00
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S11.DAT
  TIME/DATE OF STUDY: 10:40 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.036
   2)   10.00;  1.358
   3)   15.00;  1.014
   4)   20.00;  0.814
   5)   25.00;  0.693
   6)   30.00;  0.612
   7)   40.00;  0.530
   8)   50.00;  0.473
   9)   60.00;  0.439
  10)   90.00;  0.380
  11)  120.00;  0.337
  12)  180.00;  0.286
  13)  360.00;  0.218
  14) 1440.00;  0.098
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11101.00 TO NODE  11102.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   920.30
  ELEVATION DATA: UPSTREAM(FEET) =   4391.58  DOWNSTREAM(FEET) =   4080.28

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.444
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.121
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.68      0.60     1.000     0   13.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.26
  TOTAL AREA(ACRES) =      2.68   PEAK FLOW RATE(CFS) =      1.26

************************************************************************
  FLOW PROCESS FROM NODE  11102.00 TO NODE  11103.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4080.28  DOWNSTREAM(FEET) =   3876.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.85   CHANNEL SLOPE =  0.2123
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.958
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.96      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.40
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   16.41
  SUBAREA AREA(ACRES) =    39.96       SUBAREA RUNOFF(CFS) =   12.87
  EFFECTIVE AREA(ACRES) =     42.64     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       42.6         PEAK FLOW RATE(CFS) =      13.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   6.23
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11103.00 =    1880.15 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11103.00 TO NODE  11104.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   3876.52  DOWNSTREAM(FEET) =   3625.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1902.80   CHANNEL SLOPE =  0.1317
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.767
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.64      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.73
  AVERAGE FLOW DEPTH(FEET) =   1.07   TRAVEL TIME(MIN.) =   5.53
  Tc(MIN.) =   21.94
  SUBAREA AREA(ACRES) =    75.64       SUBAREA RUNOFF(CFS) =   11.38
  EFFECTIVE AREA(ACRES) =    118.28     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.3         PEAK FLOW RATE(CFS) =      17.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   5.56
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11104.00 =    3782.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11104.00 TO NODE  11105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3625.86  DOWNSTREAM(FEET) =   3222.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2898.91   CHANNEL SLOPE =  0.1391
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.610
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      167.73      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.83
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   8.29
  Tc(MIN.) =   30.23
  SUBAREA AREA(ACRES) =   167.73       SUBAREA RUNOFF(CFS) =    1.54
  EFFECTIVE AREA(ACRES) =    286.01     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.0         PEAK FLOW RATE(CFS) =      17.79
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.02   FLOW VELOCITY(FEET/SEC.) =   5.71
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11105.00 =    6681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =  51
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3222.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2480.35   CHANNEL SLOPE =  0.1089
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.545
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      252.33      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.17
  AVERAGE FLOW DEPTH(FEET) =   1.07   TRAVEL TIME(MIN.) =   7.99
  Tc(MIN.) =   38.23
  SUBAREA AREA(ACRES) =   252.33       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    538.34     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      538.3         PEAK FLOW RATE(CFS) =      17.79
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =   5.17
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11121.00 =    9162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   38.23
  RAINFALL INTENSITY(INCH/HR) =   0.54
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     538.34
  TOTAL STREAM AREA(ACRES) =     538.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      17.79

****************************************************************************
  FLOW PROCESS FROM NODE  11111.00 TO NODE  11112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   329.73
  ELEVATION DATA: UPSTREAM(FEET) =   4094.14  DOWNSTREAM(FEET) =   3956.68

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.552
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.554
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.49      0.60     1.000     0    8.55
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.28
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      1.28

****************************************************************************
  FLOW PROCESS FROM NODE  11112.00 TO NODE  11113.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3956.68  DOWNSTREAM(FEET) =   3752.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.35   CHANNEL SLOPE =  0.3066
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.316
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        9.55      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.38
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =   10.61
  SUBAREA AREA(ACRES) =     9.55       SUBAREA RUNOFF(CFS) =    6.15
  EFFECTIVE AREA(ACRES) =     11.04     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       11.0         PEAK FLOW RATE(CFS) =       7.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   6.11
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11113.00 =     995.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11113.00 TO NODE  11114.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3752.68  DOWNSTREAM(FEET) =   3541.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   955.83   CHANNEL SLOPE =  0.2209
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.143
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       26.09      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.34
  AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   13.13
  SUBAREA AREA(ACRES) =    26.09       SUBAREA RUNOFF(CFS) =   12.75
  EFFECTIVE AREA(ACRES) =     37.13     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.1         PEAK FLOW RATE(CFS) =      18.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.94   FLOW VELOCITY(FEET/SEC.) =   6.80
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11114.00 =    1950.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11114.00 TO NODE  11115.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3541.57  DOWNSTREAM(FEET) =   3320.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.90   CHANNEL SLOPE =  0.1172
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.871
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       51.13      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.77
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   5.45
  Tc(MIN.) =   18.58
  SUBAREA AREA(ACRES) =    51.13       SUBAREA RUNOFF(CFS) =   12.46
  EFFECTIVE AREA(ACRES) =     88.26     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       88.3         PEAK FLOW RATE(CFS) =      21.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =   5.60
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11115.00 =    3840.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11115.00 TO NODE  11116.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3320.00  DOWNSTREAM(FEET) =   3162.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.45   CHANNEL SLOPE =  0.0837
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.709
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED                -      193.52      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.45
  AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   5.76
  Tc(MIN.) =   24.34
  SUBAREA AREA(ACRES) =   193.52       SUBAREA RUNOFF(CFS) =   19.00
  EFFECTIVE AREA(ACRES) =    281.78     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.8         PEAK FLOW RATE(CFS) =      27.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   5.25
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11116.00 =    5724.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11116.00 TO NODE  11117.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3162.36  DOWNSTREAM(FEET) =   3062.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.90   CHANNEL SLOPE =  0.0524
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.600
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      112.47      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.42
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   7.17
  Tc(MIN.) =   31.51
  SUBAREA AREA(ACRES) =   112.47       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    394.25     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      394.2         PEAK FLOW RATE(CFS) =      27.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =   4.41
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11117.00 =    7628.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.66  DOWNSTREAM(FEET) =   2952.48
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1878.40   CHANNEL SLOPE =  0.0587
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.544
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       51.63      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   6.81
  Tc(MIN.) =   38.32
  SUBAREA AREA(ACRES) =    51.63       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    445.88     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      445.9         PEAK FLOW RATE(CFS) =      27.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =   4.60
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   38.32
  RAINFALL INTENSITY(INCH/HR) =   0.54
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     445.88
  TOTAL STREAM AREA(ACRES) =     445.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.66

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       17.79   38.23    0.545  0.60( 0.60) 1.00     538.3   11101.00
      2       27.66   38.32    0.544  0.60( 0.60) 1.00     445.9   11111.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       45.43   38.23    0.545  0.60( 0.60) 1.00     983.1   11101.00
```

```
     2       45.43   38.32    0.544  0.60( 0.60) 1.00     984.2   11111.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      45.43    Tc(MIN.) =    38.32
  EFFECTIVE AREA(ACRES) =     984.22   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      984.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11121.00 TO NODE  11122.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2952.48  DOWNSTREAM(FEET) =   2639.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2687.92   CHANNEL SLOPE =  0.1165
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.502
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      170.98      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.73
  AVERAGE FLOW DEPTH(FEET) =   1.50   TRAVEL TIME(MIN.) =   6.66
  Tc(MIN.) =   44.98
  SUBAREA AREA(ACRES) =   170.98       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1155.20     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1155.2         PEAK FLOW RATE(CFS) =      45.43
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =   6.73
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11122.00 =   12194.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2639.37  DOWNSTREAM(FEET) =   1954.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3696.53   CHANNEL SLOPE =  0.1854
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.464
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -      114.61      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.00
  AVERAGE FLOW DEPTH(FEET) =   1.38   TRAVEL TIME(MIN.) =   7.70
  Tc(MIN.) =   52.69
  SUBAREA AREA(ACRES) =   114.61       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1269.81     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1269.8         PEAK FLOW RATE(CFS) =      45.43
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   8.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   52.69
  RAINFALL INTENSITY(INCH/HR) =   0.46
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1269.81
  TOTAL STREAM AREA(ACRES) =    1269.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      45.43

****************************************************************************
  FLOW PROCESS FROM NODE  11130.00 TO NODE  11131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   259.85
  ELEVATION DATA: UPSTREAM(FEET) =   3923.93  DOWNSTREAM(FEET) =   3765.35

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.204
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.737
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.27      0.60     1.000     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.30
  TOTAL AREA(ACRES) =      1.27   PEAK FLOW RATE(CFS) =      1.30
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11131.00 TO NODE  11132.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3765.35  DOWNSTREAM(FEET) =   3414.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   674.05   CHANNEL SLOPE =  0.5200
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.500
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.52      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.43
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   1.75
  Tc(MIN.) =    8.95
  SUBAREA AREA(ACRES) =     6.52       SUBAREA RUNOFF(CFS) =    5.28
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =       6.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   7.25
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11132.00 =     933.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11132.00 TO NODE  11133.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3414.86  DOWNSTREAM(FEET) =   2699.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1813.44   CHANNEL SLOPE =  0.3945
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.183
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.63      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.40
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   3.60
  Tc(MIN.) =   12.55
  SUBAREA AREA(ACRES) =    41.63       SUBAREA RUNOFF(CFS) =   21.83
  EFFECTIVE AREA(ACRES) =     49.42     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       49.4         PEAK FLOW RATE(CFS) =      25.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   9.26
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11133.00 =    2747.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11133.00 TO NODE  11134.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2699.51  DOWNSTREAM(FEET) =   2464.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1053.33   CHANNEL SLOPE =  0.2235
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.049
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      142.85      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.05
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   1.94
  Tc(MIN.) =   14.49
  SUBAREA AREA(ACRES) =   142.85       SUBAREA RUNOFF(CFS) =   57.77
  EFFECTIVE AREA(ACRES) =    192.27     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      192.3         PEAK FLOW RATE(CFS) =      77.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.62   FLOW VELOCITY(FEET/SEC.) =   9.85
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11134.00 =    3800.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.06  DOWNSTREAM(FEET) =   1954.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1291.98   CHANNEL SLOPE =  0.3946
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.965
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.58      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.37
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =   1.74
  Tc(MIN.) =   16.23
  SUBAREA AREA(ACRES) =    24.58       SUBAREA RUNOFF(CFS) =    8.07
  EFFECTIVE AREA(ACRES) =    216.85     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      216.9         PEAK FLOW RATE(CFS) =      77.75
```

```
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.46   FLOW VELOCITY(FEET/SEC.) =  12.16
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11141.00 =    5092.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.23
  RAINFALL INTENSITY(INCH/HR) =   0.96
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     216.85
  TOTAL STREAM AREA(ACRES) =     216.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      77.75

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       45.43   52.59    0.464  0.60( 0.60) 1.00    1268.7   11101.00
      1       45.43   52.69    0.464  0.60( 0.60) 1.00    1269.8   11111.00
      2       77.75   16.23    0.965  0.60( 0.60) 1.00     216.9   11130.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      106.89   16.23    0.965  0.60( 0.60) 1.00     608.4   11130.00
      2       45.43   52.59    0.464  0.60( 0.60) 1.00    1485.6   11101.00
      3       45.43   52.69    0.464  0.60( 0.60) 1.00    1486.7   11111.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     106.89    Tc(MIN.) =    16.23
  EFFECTIVE AREA(ACRES) =     608.38   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1486.7
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1486.7  TC(MIN.) =     16.23
  EFFECTIVE AREA(ACRES) =    608.38  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     106.89

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      106.89   16.23    0.965  0.60( 0.60) 1.00     608.4   11130.00
      2       45.43   52.59    0.464  0.60( 0.60) 1.00    1485.6   11101.00
```



```
      3       45.43   52.69    0.464  0.60( 0.60) 1.00    1486.7   11111.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S12.DAT
  TIME/DATE OF STUDY: 10:40 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.036
   2)   10.00;  1.358
   3)   15.00;  1.014
   4)   20.00;  0.814
   5)   25.00;  0.693
   6)   30.00;  0.612
   7)   40.00;  0.530
   8)   50.00;  0.473
   9)   60.00;  0.439
  10)   90.00;  0.380
  11)  120.00;  0.337
  12)  180.00;  0.286
  13)  360.00;  0.218
  14) 1440.00;  0.098
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11220.00 TO NODE  11221.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   762.39
  ELEVATION DATA: UPSTREAM(FEET) =   3797.72  DOWNSTREAM(FEET) =   3296.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.919
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.295
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        5.02      0.60     1.000     0   10.92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.14
  TOTAL AREA(ACRES) =      5.02   PEAK FLOW RATE(CFS) =      3.14

************************************************************************
  FLOW PROCESS FROM NODE  11221.00 TO NODE  11223.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3296.86  DOWNSTREAM(FEET) =   2738.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   912.82   CHANNEL SLOPE =  0.6112
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.173
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       26.44      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.60
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   1.77
  Tc(MIN.) =   12.69
  SUBAREA AREA(ACRES) =    26.44       SUBAREA RUNOFF(CFS) =   13.64
  EFFECTIVE AREA(ACRES) =     31.46     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.5         PEAK FLOW RATE(CFS) =      16.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   9.75
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11223.00 =    1675.21 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11223.00 TO NODE  11224.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2738.96  DOWNSTREAM(FEET) =   2370.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.79   CHANNEL SLOPE =  0.3843
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.060
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.44      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.71
  AVERAGE FLOW DEPTH(FEET) =   1.07   TRAVEL TIME(MIN.) =   1.65
  Tc(MIN.) =   14.33
  SUBAREA AREA(ACRES) =    82.44       SUBAREA RUNOFF(CFS) =   34.13
  EFFECTIVE AREA(ACRES) =    113.90     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.9         PEAK FLOW RATE(CFS) =      47.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =  10.63
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11224.00 =    2635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2370.12  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.40   CHANNEL SLOPE =  0.2591
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.885
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.50
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   3.90
  Tc(MIN.) =   18.23
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =   15.88
  EFFECTIVE AREA(ACRES) =    175.83     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      175.8         PEAK FLOW RATE(CFS) =      47.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   9.17
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  10
----------------------------------------------------------------------------
```



```
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S11.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      106.89   16.23  0.60( 0.60) 1.00     608.4   11130.00
      2       45.43   52.59  0.60( 0.60) 1.00    1485.6   11101.00
      3       45.43   52.69  0.60( 0.60) 1.00    1486.7   11111.00
    TOTAL AREA(ACRES) =     1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      106.89   16.23  0.60( 0.60) 1.00     608.4   11130.00
      2       45.43   52.59  0.60( 0.60) 1.00    1485.6   11101.00
      3       45.43   52.69  0.60( 0.60) 1.00    1486.7   11111.00
    TOTAL AREA(ACRES) =      1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11231.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1954.20  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1435.64   CHANNEL SLOPE =  0.1116
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.851
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       89.78      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     117.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.39
  AVERAGE FLOW DEPTH(FEET) =   2.16   TRAVEL TIME(MIN.) =   2.85
  Tc(MIN.) =   19.08
  SUBAREA AREA(ACRES) =    89.78       SUBAREA RUNOFF(CFS) =   20.27
  EFFECTIVE AREA(ACRES) =    698.16     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1576.4         PEAK FLOW RATE(CFS) =     157.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  2.41   FLOW VELOCITY(FEET/SEC.) =   9.06
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      157.61   19.08    0.851  0.60( 0.60) 1.00     698.2   11130.00
      2       45.43   56.21    0.452  0.60( 0.60) 1.00    1575.3   11101.00
      3       45.43   56.31    0.452  0.60( 0.60) 1.00    1576.4   11111.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       47.15   18.23    0.885  0.60( 0.60) 1.00     175.8   11220.00
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      204.77   18.23    0.885  0.60( 0.60) 1.00     842.9   11220.00
      2      199.14   19.08    0.851  0.60( 0.60) 1.00     874.0   11130.00
      3       45.43   56.21    0.452  0.60( 0.60) 1.00    1751.2   11101.00
      4       45.43   56.31    0.452  0.60( 0.60) 1.00    1752.3   11111.00
    TOTAL AREA(ACRES) =      1752.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      204.77  Tc(MIN.) =   18.232
  EFFECTIVE AREA(ACRES) =    842.88  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1752.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.01  DOWNSTREAM(FEET) =   1680.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.84   CHANNEL SLOPE =  0.0585
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.754
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.78      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     208.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.62
```



```
  AVERAGE FLOW DEPTH(FEET) =   3.02   TRAVEL TIME(MIN.) =   4.23
  Tc(MIN.) =   22.46
  SUBAREA AREA(ACRES) =    59.78       SUBAREA RUNOFF(CFS) =    8.31
  EFFECTIVE AREA(ACRES) =    902.66     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1812.1          PEAK FLOW RATE(CFS) =     204.77
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.00   FLOW VELOCITY(FEET/SEC.) =   7.58
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.46
  RAINFALL INTENSITY(INCH/HR) =   0.75
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     902.66
  TOTAL STREAM AREA(ACRES) =    1812.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     204.77

****************************************************************************
  FLOW PROCESS FROM NODE  11201.00 TO NODE  11202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   986.34
  ELEVATION DATA: UPSTREAM(FEET) =   3383.22  DOWNSTREAM(FEET) =   3248.87

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.343
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.266
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                -        8.54      0.60     1.000     0   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.12
  TOTAL AREA(ACRES) =      8.54   PEAK FLOW RATE(CFS) =      5.12

****************************************************************************
  FLOW PROCESS FROM NODE  11202.00 TO NODE  11203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3248.87  DOWNSTREAM(FEET) =   3198.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   922.69   CHANNEL SLOPE =  0.0550
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```

```
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.981
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       24.42      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.43
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.44
 AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   4.48
 Tc(MIN.) =   15.82
 SUBAREA AREA(ACRES) =    24.42       SUBAREA RUNOFF(CFS) =    8.38
 EFFECTIVE AREA(ACRES) =     32.96     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       33.0          PEAK FLOW RATE(CFS) =      11.31

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   3.59
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11203.00 =    1909.03 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11203.00 TO NODE  11204.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3198.08  DOWNSTREAM(FEET) =   3062.48
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1941.08   CHANNEL SLOPE =  0.0699
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.725
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       37.67      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.12
 AVERAGE FLOW DEPTH(FEET) =   1.05   TRAVEL TIME(MIN.) =   7.85
 Tc(MIN.) =   23.67
 SUBAREA AREA(ACRES) =    37.67       SUBAREA RUNOFF(CFS) =    4.25
 EFFECTIVE AREA(ACRES) =     70.63     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       70.6          PEAK FLOW RATE(CFS) =      11.31
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =   3.93
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11204.00 =    3850.11 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11204.00 TO NODE  11205.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```



```
 ELEVATION DATA: UPSTREAM(FEET) =   3062.48  DOWNSTREAM(FEET) =   2940.56
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.73   CHANNEL SLOPE =  0.0636
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.595
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       34.87      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.80
 AVERAGE FLOW DEPTH(FEET) =   1.00   TRAVEL TIME(MIN.) =   8.41
 Tc(MIN.) =   32.08
 SUBAREA AREA(ACRES) =    34.87       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    105.50     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      105.5          PEAK FLOW RATE(CFS) =      11.31
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   3.80
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11205.00 =    5766.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11205.00 TO NODE  11206.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2940.56  DOWNSTREAM(FEET) =   2581.93
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2865.58   CHANNEL SLOPE =  0.1252
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.519
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       56.17      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.87
 AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   9.81
 Tc(MIN.) =   41.89
 SUBAREA AREA(ACRES) =    56.17       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    161.67     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      161.7          PEAK FLOW RATE(CFS) =      11.31
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  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   4.87
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11206.00 =    8632.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11206.00 TO NODE  11207.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.93  DOWNSTREAM(FEET) =   2317.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1985.44   CHANNEL SLOPE =  0.1333
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.482
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      546.87      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.02
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   6.59
  Tc(MIN.) =   48.49
  SUBAREA AREA(ACRES) =   546.87       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    708.54     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      708.5         PEAK FLOW RATE(CFS) =      11.31
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   5.02
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11207.00 =   10617.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2317.20  DOWNSTREAM(FEET) =   1680.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4085.95   CHANNEL SLOPE =  0.1557
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.436
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      389.75      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



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  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.29
  AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =  12.86
  Tc(MIN.) =   61.35
  SUBAREA AREA(ACRES) =   389.75       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1098.29     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1098.3         PEAK FLOW RATE(CFS) =      11.31
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) =   5.29
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11241.00 =   14703.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   61.35
  RAINFALL INTENSITY(INCH/HR) =   0.44
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1098.29
  TOTAL STREAM AREA(ACRES) =    1098.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      11.31

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      204.77   22.46    0.754  0.60( 0.60) 1.00     902.7   11220.00
      1      199.14   23.34    0.733  0.60( 0.60) 1.00     933.8   11130.00
      1       45.43   62.41    0.434  0.60( 0.60) 1.00    1811.0   11101.00
      1       45.43   62.50    0.434  0.60( 0.60) 1.00    1812.1   11111.00
      2       11.31   61.35    0.436  0.60( 0.60) 1.00    1098.3   11201.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      211.93   22.46    0.754  0.60( 0.60) 1.00    1304.8   11220.00
      2      206.37   23.34    0.733  0.60( 0.60) 1.00    1351.6   11130.00
      3       60.90   61.35    0.436  0.60( 0.60) 1.00    2885.5   11201.00
      4       56.69   62.41    0.434  0.60( 0.60) 1.00    2909.2   11101.00
      5       56.68   62.50    0.434  0.60( 0.60) 1.00    2910.3   11111.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     211.93    Tc(MIN.) =    22.46
```

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  EFFECTIVE AREA(ACRES) =    1304.83   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2910.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11241.00 TO NODE  11242.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1680.94  DOWNSTREAM(FEET) =   1521.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1795.61   CHANNEL SLOPE =  0.0890
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.680
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      198.62      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     219.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.04
  AVERAGE FLOW DEPTH(FEET) =   2.84   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   25.78
  SUBAREA AREA(ACRES) =   198.62       SUBAREA RUNOFF(CFS) =   14.40
  EFFECTIVE AREA(ACRES) =   1503.45     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3109.0         PEAK FLOW RATE(CFS) =     211.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.81   FLOW VELOCITY(FEET/SEC.) =   8.94
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11242.00 =   21056.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1521.21  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.33   CHANNEL SLOPE =  0.0797
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.611
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       95.39      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     212.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.59
  AVERAGE FLOW DEPTH(FEET) =   2.87   TRAVEL TIME(MIN.) =   4.32
  Tc(MIN.) =   30.09
  SUBAREA AREA(ACRES) =    95.39       SUBAREA RUNOFF(CFS) =    0.98
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  EFFECTIVE AREA(ACRES) =   1598.84     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3204.3         PEAK FLOW RATE(CFS) =     211.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.87   FLOW VELOCITY(FEET/SEC.) =   8.60
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.09
  RAINFALL INTENSITY(INCH/HR) =   0.61
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1598.84
  TOTAL STREAM AREA(ACRES) =    3204.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     211.93

****************************************************************************
  FLOW PROCESS FROM NODE  11250.00 TO NODE  11251.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   982.50
  ELEVATION DATA: UPSTREAM(FEET) =   3806.44  DOWNSTREAM(FEET) =   3168.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.112
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.213
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.91      0.60     1.000     0   12.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.26
  TOTAL AREA(ACRES) =      5.91   PEAK FLOW RATE(CFS) =      3.26

****************************************************************************
  FLOW PROCESS FROM NODE  11251.00 TO NODE  11252.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3168.25  DOWNSTREAM(FEET) =   2683.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.5240
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.064
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.73      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.13
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   14.28
  SUBAREA AREA(ACRES) =    13.73       SUBAREA RUNOFF(CFS) =    5.73
  EFFECTIVE AREA(ACRES) =     19.64     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       19.6         PEAK FLOW RATE(CFS) =       8.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   7.65
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11252.00 =    1908.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11252.00 TO NODE  11253.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2683.24  DOWNSTREAM(FEET) =   2334.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.66   CHANNEL SLOPE =  0.3694
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.966
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       55.67      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.16
  AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   16.20
  SUBAREA AREA(ACRES) =    55.67       SUBAREA RUNOFF(CFS) =   18.33
  EFFECTIVE AREA(ACRES) =     75.31     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       75.3         PEAK FLOW RATE(CFS) =      24.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   8.89
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11253.00 =    2852.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11253.00 TO NODE  11254.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2334.26  DOWNSTREAM(FEET) =   1768.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2293.59   CHANNEL SLOPE =  0.2468
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```



```
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.799
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.43      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.69
  AVERAGE FLOW DEPTH(FEET) =   1.24   TRAVEL TIME(MIN.) =   4.40
  Tc(MIN.) =   20.60
  SUBAREA AREA(ACRES) =   165.43       SUBAREA RUNOFF(CFS) =   29.70
  EFFECTIVE AREA(ACRES) =    240.74     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      240.7         PEAK FLOW RATE(CFS) =      43.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.28   FLOW VELOCITY(FEET/SEC.) =   8.81
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11254.00 =    5146.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11254.00 TO NODE  11255.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1768.11  DOWNSTREAM(FEET) =   1506.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.59   CHANNEL SLOPE =  0.1376
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.696
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.55      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
  AVERAGE FLOW DEPTH(FEET) =   1.53   TRAVEL TIME(MIN.) =   4.26
  Tc(MIN.) =   24.87
  SUBAREA AREA(ACRES) =   194.55       SUBAREA RUNOFF(CFS) =   16.86
  EFFECTIVE AREA(ACRES) =    435.29     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      435.3         PEAK FLOW RATE(CFS) =      43.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =   7.11
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11255.00 =    7043.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1506.97  DOWNSTREAM(FEET) =   1343.95
 CHANNEL LENGTH THRU SUBAREA(FEET) =   882.10   CHANNEL SLOPE =  0.1848
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.666
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      137.86      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.34
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.06
 AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   1.82
 Tc(MIN.) =   26.69
 SUBAREA AREA(ACRES) =   137.86       SUBAREA RUNOFF(CFS) =    8.15
 EFFECTIVE AREA(ACRES) =    573.15     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      573.1         PEAK FLOW RATE(CFS) =      43.23
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   7.93
 LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11261.00 =    7926.06 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   26.69
 RAINFALL INTENSITY(INCH/HR) =   0.67
 AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     573.15
 TOTAL STREAM AREA(ACRES) =     573.15
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      43.23

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      211.93   30.09    0.611  0.60( 0.60) 1.00    1598.8   11220.00
     1      206.37   31.03    0.604  0.60( 0.60) 1.00    1645.6   11130.00
     1       60.90   71.81    0.416  0.60( 0.60) 1.00    3179.5   11201.00
     1       56.69   73.07    0.413  0.60( 0.60) 1.00    3203.3   11101.00
     1       56.68   73.16    0.413  0.60( 0.60) 1.00    3204.3   11111.00
     2       43.23   26.69    0.666  0.60( 0.60) 1.00     573.1   11250.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```



```
     1      255.15   26.69    0.666  0.60( 0.60) 1.00    1991.5   11250.00
     2      219.42   30.09    0.611  0.60( 0.60) 1.00    2172.0   11220.00
     3      208.80   31.03    0.604  0.60( 0.60) 1.00    2218.8   11130.00
     4       60.90   71.81    0.416  0.60( 0.60) 1.00    3752.6   11201.00
     5       56.68   73.07    0.413  0.60( 0.60) 1.00    3776.4   11101.00
     6       56.68   73.16    0.413  0.60( 0.60) 1.00    3777.5   11111.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     255.15    Tc(MIN.) =    26.69
 EFFECTIVE AREA(ACRES) =    1991.45   AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3777.5
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1343.95  DOWNSTREAM(FEET) =   1299.17
 CHANNEL LENGTH THRU SUBAREA(FEET) =   889.38   CHANNEL SLOPE =  0.0503
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.634
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       79.65      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     256.38
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.57
 AVERAGE FLOW DEPTH(FEET) =   3.36   TRAVEL TIME(MIN.) =   1.96
 Tc(MIN.) =   28.65
 SUBAREA AREA(ACRES) =    79.65       SUBAREA RUNOFF(CFS) =    2.44
 EFFECTIVE AREA(ACRES) =   2071.10     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3857.1         PEAK FLOW RATE(CFS) =     255.15
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.35   FLOW VELOCITY(FEET/SEC.) =   7.57
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11310.00 =   24168.81 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     3857.1  TC(MIN.) =     28.65
 EFFECTIVE AREA(ACRES) =   2071.10  AREA-AVERAGED Fm(INCH/HR)=  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =     255.15

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      255.15   28.65    0.634  0.60( 0.60) 1.00    2071.1   11250.00
     2      219.42   32.13    0.595  0.60( 0.60) 1.00    2251.6   11220.00
     3      208.80   33.09    0.587  0.60( 0.60) 1.00    2298.4   11130.00
     4       60.90   74.61    0.410  0.60( 0.60) 1.00    3832.3   11201.00
```

```
      5       56.68   75.91    0.408  0.60( 0.60) 1.00    3856.1   11101.00
      6       56.68   76.00    0.408  0.60( 0.60) 1.00    3857.1   11111.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S13.DAT
  TIME/DATE OF STUDY: 10:40 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.036
   2)   10.00;  1.358
   3)   15.00;  1.014
   4)   20.00;  0.814
   5)   25.00;  0.693
   6)   30.00;  0.612
   7)   40.00;  0.530
   8)   50.00;  0.473
   9)   60.00;  0.439
  10)   90.00;  0.380
  11)  120.00;  0.337
  12)  180.00;  0.286
  13)  360.00;  0.218
  14) 1440.00;  0.098
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11300.00 TO NODE  11301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   455.90
  ELEVATION DATA: UPSTREAM(FEET) =   3394.67  DOWNSTREAM(FEET) =   3247.06

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.240
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.341
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.53      0.60     1.000     0   10.24
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.69
  TOTAL AREA(ACRES) =      2.53   PEAK FLOW RATE(CFS) =      1.69

**************************************************************************
  FLOW PROCESS FROM NODE  11301.00 TO NODE  11301.50 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3247.06  DOWNSTREAM(FEET) =   3150.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   468.69   CHANNEL SLOPE =  0.2059
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.227
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       10.95      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.71
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   1.66
  Tc(MIN.) =   11.90
  SUBAREA AREA(ACRES) =    10.95       SUBAREA RUNOFF(CFS) =    6.18
  EFFECTIVE AREA(ACRES) =     13.48     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.5         PEAK FLOW RATE(CFS) =       7.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   5.34
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11301.50 =     924.59 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11301.50 TO NODE  11302.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   3150.57  DOWNSTREAM(FEET) =   2840.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =   982.20   CHANNEL SLOPE =  0.3162
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.056
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.59      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.59
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   14.38
  SUBAREA AREA(ACRES) =     9.59       SUBAREA RUNOFF(CFS) =    3.94
  EFFECTIVE AREA(ACRES) =     23.07     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.1         PEAK FLOW RATE(CFS) =       9.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   6.61
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11302.00 =    1906.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11302.00 TO NODE  11303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2840.04  DOWNSTREAM(FEET) =   2177.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.03   CHANNEL SLOPE =  0.3460
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.885
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.31      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.31
  AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =   3.84
  Tc(MIN.) =   18.23
  SUBAREA AREA(ACRES) =    84.31       SUBAREA RUNOFF(CFS) =   21.63
  EFFECTIVE AREA(ACRES) =    107.38     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.4         PEAK FLOW RATE(CFS) =      27.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.01   FLOW VELOCITY(FEET/SEC.) =   8.97
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11303.00 =    3822.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11303.00 TO NODE  11304.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2177.16  DOWNSTREAM(FEET) =   1612.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2472.34   CHANNEL SLOPE =  0.2285
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.734
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       99.61      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.09
  AVERAGE FLOW DEPTH(FEET) =   1.18   TRAVEL TIME(MIN.) =   5.10
  Tc(MIN.) =   23.32
  SUBAREA AREA(ACRES) =    99.61       SUBAREA RUNOFF(CFS) =   11.99
  EFFECTIVE AREA(ACRES) =    206.99     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.0         PEAK FLOW RATE(CFS) =      27.55
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   7.65
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11304.00 =    6295.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1612.27  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2432.96   CHANNEL SLOPE =  0.1604
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.623
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.86      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.75
  AVERAGE FLOW DEPTH(FEET) =   1.18   TRAVEL TIME(MIN.) =   6.01
  Tc(MIN.) =   29.33
  SUBAREA AREA(ACRES) =    53.86       SUBAREA RUNOFF(CFS) =    1.11
  EFFECTIVE AREA(ACRES) =    260.85     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      260.8         PEAK FLOW RATE(CFS) =      27.55
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   6.71
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S12.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      255.15   28.65  0.60( 0.60) 1.00    2071.1   11250.00
      2      219.42   32.13  0.60( 0.60) 1.00    2251.6   11220.00
      3      208.80   33.09  0.60( 0.60) 1.00    2298.4   11130.00
      4       60.90   74.61  0.60( 0.60) 1.00    3832.3   11201.00
      5       56.68   75.91  0.60( 0.60) 1.00    3856.1   11101.00
      6       56.68   76.00  0.60( 0.60) 1.00    3857.1   11111.00
    TOTAL AREA(ACRES) =     3857.1

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      255.15   28.65  0.60( 0.60) 1.00    2071.1   11250.00
      2      219.42   32.13  0.60( 0.60) 1.00    2251.6   11220.00
      3      208.80   33.09  0.60( 0.60) 1.00    2298.4   11130.00
      4       60.90   74.61  0.60( 0.60) 1.00    3832.3   11201.00
      5       56.68   75.91  0.60( 0.60) 1.00    3856.1   11101.00
      6       56.68   76.00  0.60( 0.60) 1.00    3857.1   11111.00
    TOTAL AREA(ACRES) =      3857.1

****************************************************************************
  FLOW PROCESS FROM NODE  11310.00 TO NODE  11320.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1299.17  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1694.05   CHANNEL SLOPE =  0.0455
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.591
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.22      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
```



```
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     255.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.29
  AVERAGE FLOW DEPTH(FEET) =   3.42   TRAVEL TIME(MIN.) =   3.87
  Tc(MIN.) =   32.52
  SUBAREA AREA(ACRES) =    83.22       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2154.32     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3940.4          PEAK FLOW RATE(CFS) =     255.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.42   FLOW VELOCITY(FEET/SEC.) =   7.29
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      255.15   32.52    0.591  0.60( 0.60) 1.00    2154.3   11250.00
      2      219.42   36.15    0.562  0.60( 0.60) 1.00    2334.9   11220.00
      3      208.80   37.16    0.553  0.60( 0.60) 1.00    2381.6   11130.00
      4       60.90   80.15    0.399  0.60( 0.60) 1.00    3915.5   11201.00
      5       56.68   81.55    0.397  0.60( 0.60) 1.00    3939.3   11101.00
      6       56.68   81.64    0.396  0.60( 0.60) 1.00    3940.4   11111.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1       27.55   29.33    0.623  0.60( 0.60) 1.00     260.8   11300.00
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      269.94   29.33    0.623  0.60( 0.60) 1.00    2204.0   11300.00
      2      255.15   32.52    0.591  0.60( 0.60) 1.00    2415.2   11250.00
      3      219.42   36.15    0.562  0.60( 0.60) 1.00    2595.7   11220.00
      4      208.80   37.16    0.553  0.60( 0.60) 1.00    2642.5   11130.00
      5       60.90   80.15    0.399  0.60( 0.60) 1.00    4176.4   11201.00
      6       56.68   81.55    0.397  0.60( 0.60) 1.00    4200.1   11101.00
      7       56.68   81.64    0.396  0.60( 0.60) 1.00    4201.2   11111.00
    TOTAL AREA(ACRES) =      4201.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      269.94  Tc(MIN.) =   29.334
  EFFECTIVE AREA(ACRES) =   2203.99  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     4201.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1222.10  DOWNSTREAM(FEET) =   1092.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3157.19   CHANNEL SLOPE =  0.0410
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.557
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.55      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     269.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.11
  AVERAGE FLOW DEPTH(FEET) =   3.56   TRAVEL TIME(MIN.) =   7.40
  Tc(MIN.) =   36.74
  SUBAREA AREA(ACRES) =   328.55       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2532.54     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     4529.8         PEAK FLOW RATE(CFS) =     269.94
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.56   FLOW VELOCITY(FEET/SEC.) =   7.11
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   36.74
  RAINFALL INTENSITY(INCH/HR) =   0.56
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2532.54
  TOTAL STREAM AREA(ACRES) =    4529.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     269.94

****************************************************************************
  FLOW PROCESS FROM NODE  11330.00 TO NODE  11331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
```



```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.83
  ELEVATION DATA: UPSTREAM(FEET) =   3270.16  DOWNSTREAM(FEET) =   3123.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.975
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.633
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.69      0.60     1.000     0    7.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.57
  TOTAL AREA(ACRES) =      1.69   PEAK FLOW RATE(CFS) =      1.57

****************************************************************************
  FLOW PROCESS FROM NODE  11331.00 TO NODE  11332.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3123.64  DOWNSTREAM(FEET) =   2903.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   710.41   CHANNEL SLOPE =  0.3104
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.339
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.15
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   2.30
  Tc(MIN.) =   10.28
  SUBAREA AREA(ACRES) =     5.82       SUBAREA RUNOFF(CFS) =    3.87
  EFFECTIVE AREA(ACRES) =      7.51     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.5         PEAK FLOW RATE(CFS) =       5.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   5.62
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11332.00 =    1010.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11332.00 TO NODE  11333.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.10  DOWNSTREAM(FEET) =   2718.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   843.93   CHANNEL SLOPE =  0.2183
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.161
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.66      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.44
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   2.59
  Tc(MIN.) =   12.86
  SUBAREA AREA(ACRES) =     9.66       SUBAREA RUNOFF(CFS) =    4.88
  EFFECTIVE AREA(ACRES) =     17.17     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.2         PEAK FLOW RATE(CFS) =       8.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   5.67
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11333.00 =    1854.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11333.00 TO NODE  11334.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2718.89  DOWNSTREAM(FEET) =   2364.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1084.60   CHANNEL SLOPE =  0.3264
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.995
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.67      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.92
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   2.61
  Tc(MIN.) =   15.48
  SUBAREA AREA(ACRES) =    11.67       SUBAREA RUNOFF(CFS) =    4.15
  EFFECTIVE AREA(ACRES) =     28.84     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.8         PEAK FLOW RATE(CFS) =      10.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   6.85
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11334.00 =    2938.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11334.00 TO NODE  11335.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2364.84  DOWNSTREAM(FEET) =   1729.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.08   CHANNEL SLOPE =  0.3237
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```



```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.836
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      102.74      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   3.97
  Tc(MIN.) =   19.45
  SUBAREA AREA(ACRES) =   102.74       SUBAREA RUNOFF(CFS) =   21.84
  EFFECTIVE AREA(ACRES) =    131.58     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      131.6         PEAK FLOW RATE(CFS) =      27.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   8.74
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11335.00 =    4901.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1729.46  DOWNSTREAM(FEET) =   1092.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2702.07   CHANNEL SLOPE =  0.2357
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.692
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.38      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.06
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   5.59
  Tc(MIN.) =   25.03
  SUBAREA AREA(ACRES) =    90.38       SUBAREA RUNOFF(CFS) =    7.53
  EFFECTIVE AREA(ACRES) =    221.96     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      222.0         PEAK FLOW RATE(CFS) =      27.98
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   7.77
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11340.00 =    7603.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   25.03
 RAINFALL INTENSITY(INCH/HR) =   0.69
 AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     221.96
 TOTAL STREAM AREA(ACRES) =     221.96
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.98

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      269.94   36.74    0.557  0.60( 0.60) 1.00    2532.5   11300.00
     1      255.15   40.03    0.530  0.60( 0.60) 1.00    2743.7   11250.00
     1      219.42   43.95    0.508  0.60( 0.60) 1.00    2924.3   11220.00
     1      208.80   45.05    0.501  0.60( 0.60) 1.00    2971.0   11130.00
     1       60.90   90.88    0.379  0.60( 0.60) 1.00    4504.9   11201.00
     1       56.68   92.48    0.376  0.60( 0.60) 1.00    4528.7   11101.00
     1       56.68   92.57    0.376  0.60( 0.60) 1.00    4529.8   11111.00
     2       27.98   25.03    0.692  0.60( 0.60) 1.00     222.0   11330.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      256.75   25.03    0.692  0.60( 0.60) 1.00    1947.7   11330.00
     2      269.94   36.74    0.557  0.60( 0.60) 1.00    2754.5   11300.00
     3      255.15   40.03    0.530  0.60( 0.60) 1.00    2965.7   11250.00
     4      219.42   43.95    0.508  0.60( 0.60) 1.00    3146.2   11220.00
     5      208.80   45.05    0.501  0.60( 0.60) 1.00    3193.0   11130.00
     6       60.90   90.88    0.379  0.60( 0.60) 1.00    4726.9   11201.00
     7       56.68   92.48    0.376  0.60( 0.60) 1.00    4750.6   11101.00
     8       56.68   92.57    0.376  0.60( 0.60) 1.00    4751.7   11111.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     269.94    Tc(MIN.) =    36.74
 EFFECTIVE AREA(ACRES) =    2754.50   AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4751.7
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11340.00 TO NODE  11341.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1092.58  DOWNSTREAM(FEET) =   1055.49
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.69   CHANNEL SLOPE =  0.0259
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.526
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
 USER-DEFINED                -       54.55      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     269.94
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.98
 AVERAGE FLOW DEPTH(FEET) =   3.88   TRAVEL TIME(MIN.) =   3.99
 Tc(MIN.) =   40.73
 SUBAREA AREA(ACRES) =    54.55       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   2809.05     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     4806.3         PEAK FLOW RATE(CFS) =     269.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.88   FLOW VELOCITY(FEET/SEC.) =   5.98
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11341.00 =   30452.74 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11341.00 TO NODE  11342.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1055.49  DOWNSTREAM(FEET) =   1017.16
 CHANNEL LENGTH THRU SUBAREA(FEET) =   943.89   CHANNEL SLOPE =  0.0406
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.513
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -      119.96      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     269.94
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.08
 AVERAGE FLOW DEPTH(FEET) =   3.57   TRAVEL TIME(MIN.) =   2.22
 Tc(MIN.) =   42.95
 SUBAREA AREA(ACRES) =   119.96       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   2929.01     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     4926.2         PEAK FLOW RATE(CFS) =     269.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.57   FLOW VELOCITY(FEET/SEC.) =   7.08
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11342.00 =   31396.63 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1017.16  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1557.63   CHANNEL SLOPE =  0.0383
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.492
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.25      0.60     0.990     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     270.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.93
  AVERAGE FLOW DEPTH(FEET) =   3.60   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   46.70
  SUBAREA AREA(ACRES) =    85.25       SUBAREA RUNOFF(CFS) =    0.38
  EFFECTIVE AREA(ACRES) =   3014.26     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     5011.5         PEAK FLOW RATE(CFS) =     269.94
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.60   FLOW VELOCITY(FEET/SEC.) =   6.93
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   46.70
  RAINFALL INTENSITY(INCH/HR) =   0.49
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3014.26
  TOTAL STREAM AREA(ACRES) =    5011.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     269.94

****************************************************************************
  FLOW PROCESS FROM NODE  11350.00 TO NODE  11351.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.54
  ELEVATION DATA: UPSTREAM(FEET) =   2805.98  DOWNSTREAM(FEET) =   2583.16
```



```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.655
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.038
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.40      0.60     1.000     0   14.66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.13
  TOTAL AREA(ACRES) =      5.40   PEAK FLOW RATE(CFS) =      2.13

****************************************************************************
  FLOW PROCESS FROM NODE  11351.00 TO NODE  11352.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2583.16  DOWNSTREAM(FEET) =   2403.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.57   CHANNEL SLOPE =  0.1876
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.884
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.56      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.44
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   3.59
  Tc(MIN.) =   18.25
  SUBAREA AREA(ACRES) =    15.56       SUBAREA RUNOFF(CFS) =    3.98
  EFFECTIVE AREA(ACRES) =     20.96     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.0         PEAK FLOW RATE(CFS) =       5.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   4.72
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11352.00 =    1907.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11352.00 TO NODE  11353.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2403.73  DOWNSTREAM(FEET) =   1786.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.85   CHANNEL SLOPE =  0.3190
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.742
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       74.05      0.60     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.82
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   4.73
  Tc(MIN.) =   22.98
  SUBAREA AREA(ACRES) =    74.05       SUBAREA RUNOFF(CFS) =    9.47
  EFFECTIVE AREA(ACRES) =     95.01     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       95.0         PEAK FLOW RATE(CFS) =      12.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   7.05
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11353.00 =    3840.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11353.00 TO NODE  11354.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1786.74  DOWNSTREAM(FEET) =   1308.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2073.35   CHANNEL SLOPE =  0.2307
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.638
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.22      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.38
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   5.41
  Tc(MIN.) =   28.39
  SUBAREA AREA(ACRES) =    41.22       SUBAREA RUNOFF(CFS) =    1.42
  EFFECTIVE AREA(ACRES) =    136.23     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      136.2         PEAK FLOW RATE(CFS) =      12.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   6.27
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11354.00 =    5914.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.39  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2455.49   CHANNEL SLOPE =  0.1429
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.561
  SUBAREA LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      201.53      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.23
  AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   7.83
  Tc(MIN.) =   36.22
  SUBAREA AREA(ACRES) =   201.53       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    337.76     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      337.8         PEAK FLOW RATE(CFS) =      12.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   5.23
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11360.00 =    8369.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   36.22
  RAINFALL INTENSITY(INCH/HR) =   0.56
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     337.76
  TOTAL STREAM AREA(ACRES) =     337.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.15

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)            (ACRES)     NODE
      1      256.75   35.12    0.570  0.60( 0.60) 1.00     2207.5   11330.00
      1      269.94   46.70    0.492  0.60( 0.60) 1.00     3014.3   11300.00
      1      255.15   50.13    0.473  0.60( 0.60) 1.00     3225.4   11250.00
      1      219.42   54.44    0.458  0.60( 0.60) 1.00     3406.0   11220.00
      1      208.80   55.68    0.454  0.60( 0.60) 1.00     3452.8   11130.00
      1       60.90  105.31    0.358  0.60( 0.60) 1.00     4986.6   11201.00
      1       56.68  107.20    0.355  0.60( 0.60) 1.00     5010.4   11101.00
      1       56.68  107.30    0.355  0.60( 0.60) 1.00     5011.5   11111.00
      2       12.15   36.22    0.561  0.60( 0.60) 1.00      337.8   11350.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      268.72   35.12    0.570  0.60( 0.60) 1.00    2534.9   11330.00
    2      270.16   36.22    0.561  0.60( 0.60) 1.00    2622.2   11350.00
    3      280.59   46.70    0.492  0.60( 0.60) 1.00    3352.0   11300.00
    4      265.39   50.13    0.473  0.60( 0.60) 1.00    3563.2   11250.00
    5      229.34   54.44    0.458  0.60( 0.60) 1.00    3743.7   11220.00
    6      218.62   55.68    0.454  0.60( 0.60) 1.00    3790.5   11130.00
    7       68.66  105.31    0.358  0.60( 0.60) 1.00    5324.4   11201.00
    8       64.38  107.20    0.355  0.60( 0.60) 1.00    5348.1   11101.00
    9       64.37  107.30    0.355  0.60( 0.60) 1.00    5349.2   11111.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     280.59    Tc(MIN.) =    46.70
  EFFECTIVE AREA(ACRES) =    3352.02   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5349.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11360.00 TO NODE  11361.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    957.53  DOWNSTREAM(FEET) =    847.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2937.03   CHANNEL SLOPE =  0.0374
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.460
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      176.74      0.60     0.977     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     281.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.95
  AVERAGE FLOW DEPTH(FEET) =   3.67   TRAVEL TIME(MIN.) =   7.05
  Tc(MIN.) =   53.74
  SUBAREA AREA(ACRES) =   176.74       SUBAREA RUNOFF(CFS) =    1.68
  EFFECTIVE AREA(ACRES) =   3528.76     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     5526.0         PEAK FLOW RATE(CFS) =     280.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.67   FLOW VELOCITY(FEET/SEC.) =   6.93
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11361.00 =   35891.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11361.00 TO NODE  11362.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    847.62  DOWNSTREAM(FEET) =    738.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3869.90   CHANNEL SLOPE =  0.0283
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.431
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      429.50      0.60     0.995     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     281.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.24
  AVERAGE FLOW DEPTH(FEET) =   3.87   TRAVEL TIME(MIN.) =  10.33
  Tc(MIN.) =   64.07
  SUBAREA AREA(ACRES) =   429.50       SUBAREA RUNOFF(CFS) =    0.83
  EFFECTIVE AREA(ACRES) =   3958.26     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     5955.5         PEAK FLOW RATE(CFS) =     280.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.87   FLOW VELOCITY(FEET/SEC.) =   6.24
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11362.00 =   39761.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    738.28  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2987.23   CHANNEL SLOPE =  0.0199
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.413
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.97      0.60     0.991     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.991
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     280.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.47
  AVERAGE FLOW DEPTH(FEET) =   4.14   TRAVEL TIME(MIN.) =   9.11
  Tc(MIN.) =   73.18
  SUBAREA AREA(ACRES) =   125.97       SUBAREA RUNOFF(CFS) =    0.42
  EFFECTIVE AREA(ACRES) =   4084.23     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
```

```
  TOTAL AREA(ACRES) =     6081.5         PEAK FLOW RATE(CFS) =     280.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.13   FLOW VELOCITY(FEET/SEC.) =   5.48
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11363.00 =   42748.42 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     6081.5  TC(MIN.) =     73.18
  EFFECTIVE AREA(ACRES) =   4084.23  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.998
  PEAK FLOW RATE(CFS)   =     280.59

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      268.72   61.89    0.435  0.60( 0.60) 1.00    3267.2   11330.00
      2      270.16   62.97    0.433  0.60( 0.60) 1.00    3354.4   11350.00
      3      280.59   73.18    0.413  0.60( 0.60) 1.00    4084.2   11300.00
      4      265.39   76.97    0.406  0.60( 0.60) 1.00    4295.4   11250.00
      5      229.34   82.28    0.395  0.60( 0.60) 1.00    4475.9   11220.00
      6      218.62   83.85    0.392  0.60( 0.60) 1.00    4522.7   11130.00
      7       68.66  142.88    0.318  0.60( 0.60) 1.00    6056.6   11201.00
      8       64.38  145.45    0.315  0.60( 0.60) 1.00    6080.4   11101.00
      9       64.37  145.54    0.315  0.60( 0.60) 1.00    6081.5   11111.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S14.DAT
  TIME/DATE OF STUDY: 10:40 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.018
   2)   10.00;  1.345
   3)   15.00;  1.007
   4)   20.00;  0.810
   5)   25.00;  0.690
   6)   30.00;  0.610
   7)   40.00;  0.527
   8)   50.00;  0.471
   9)   60.00;  0.436
  10)   90.00;  0.376
  11)  120.00;  0.333
  12)  180.00;  0.283
  13)  360.00;  0.215
  14) 1440.00;  0.097
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11401.00 TO NODE  11401.50 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   313.41
  ELEVATION DATA: UPSTREAM(FEET) =   3384.11  DOWNSTREAM(FEET) =   3232.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.137
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.596
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.25      0.60     1.000     0    8.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.02
  TOTAL AREA(ACRES) =      2.25   PEAK FLOW RATE(CFS) =      2.02

************************************************************************
  FLOW PROCESS FROM NODE  11401.50 TO NODE  11402.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3232.76  DOWNSTREAM(FEET) =   3001.05
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.75   CHANNEL SLOPE =  0.3733
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.373
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       11.39      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.25
  AVERAGE FLOW DEPTH(FEET) =   0.57   TRAVEL TIME(MIN.) =   1.65
  Tc(MIN.) =    9.79
  SUBAREA AREA(ACRES) =    11.39       SUBAREA RUNOFF(CFS) =    7.93
  EFFECTIVE AREA(ACRES) =     13.64     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.6         PEAK FLOW RATE(CFS) =       9.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   7.08
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11402.00 =     934.16 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11402.00 TO NODE  11403.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   3001.05  DOWNSTREAM(FEET) =   2787.96
 CHANNEL LENGTH THRU SUBAREA(FEET) =   962.99   CHANNEL SLOPE =  0.2213
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.196
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       26.43      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.65
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.66
 AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =   2.41
 Tc(MIN.) =   12.20
 SUBAREA AREA(ACRES) =    26.43       SUBAREA RUNOFF(CFS) =   14.18
 EFFECTIVE AREA(ACRES) =     40.07     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =      21.51

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   7.11
 LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11403.00 =    1897.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11403.00 TO NODE  11404.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2787.96  DOWNSTREAM(FEET) =   2518.71
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1956.80   CHANNEL SLOPE =  0.1376
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.921
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       67.85      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.54
 AVERAGE FLOW DEPTH(FEET) =   1.27   TRAVEL TIME(MIN.) =   4.98
 Tc(MIN.) =   17.19
 SUBAREA AREA(ACRES) =    67.85       SUBAREA RUNOFF(CFS) =   19.60
 EFFECTIVE AREA(ACRES) =    107.92     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      107.9         PEAK FLOW RATE(CFS) =      31.18

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   6.53
 LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11404.00 =    3853.95 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11404.00 TO NODE  11405.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2518.71  DOWNSTREAM(FEET) =   2304.57
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.99   CHANNEL SLOPE =  0.1101
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.753
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       80.61      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.91
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.27
 AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   5.17
 Tc(MIN.) =   22.36
 SUBAREA AREA(ACRES) =    80.61       SUBAREA RUNOFF(CFS) =   11.14
 EFFECTIVE AREA(ACRES) =    188.53     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      188.5         PEAK FLOW RATE(CFS) =      31.18
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   6.01
 LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11405.00 =    5798.94 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11405.00 TO NODE  11406.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2304.57  DOWNSTREAM(FEET) =   1888.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3280.59   CHANNEL SLOPE =  0.1270
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.602
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      111.04      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.35
 AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   8.62
 Tc(MIN.) =   30.97
 SUBAREA AREA(ACRES) =   111.04       SUBAREA RUNOFF(CFS) =    0.21
 EFFECTIVE AREA(ACRES) =    299.57     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      299.6         PEAK FLOW RATE(CFS) =      31.18
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.28   FLOW VELOCITY(FEET/SEC.) =   6.35
 LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11406.00 =    9079.53 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11406.00 TO NODE  11407.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1888.00  DOWNSTREAM(FEET) =   1539.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2842.33   CHANNEL SLOPE =  0.1226
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.539
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.19      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.22
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   7.61
  Tc(MIN.) =   38.58
  SUBAREA AREA(ACRES) =   141.19       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    440.76     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      440.8         PEAK FLOW RATE(CFS) =      31.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.29   FLOW VELOCITY(FEET/SEC.) =   6.22
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11407.00 =   11921.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11407.00 TO NODE  11408.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1539.46  DOWNSTREAM(FEET) =   1268.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2859.01   CHANNEL SLOPE =  0.0948
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.488
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      158.63      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.68
  AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   8.40
  Tc(MIN.) =   46.98
```



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  SUBAREA AREA(ACRES) =   158.63       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    599.39     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      599.4         PEAK FLOW RATE(CFS) =      31.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   5.68
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11408.00 =   14780.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11408.00 TO NODE  11409.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1268.36  DOWNSTREAM(FEET) =   1109.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2883.36   CHANNEL SLOPE =  0.0550
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.445
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      208.66      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.63
  AVERAGE FLOW DEPTH(FEET) =   1.50   TRAVEL TIME(MIN.) =  10.38
  Tc(MIN.) =   57.36
  SUBAREA AREA(ACRES) =   208.66       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    808.05     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      808.1         PEAK FLOW RATE(CFS) =      31.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =   4.63
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.00 =   17664.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.00 TO NODE  11409.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1109.80  DOWNSTREAM(FEET) =    953.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2734.25   CHANNEL SLOPE =  0.0572
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.422
```

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  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       97.66      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.68
  AVERAGE FLOW DEPTH(FEET) =   1.49   TRAVEL TIME(MIN.) =   9.74
  Tc(MIN.) =   67.10
  SUBAREA AREA(ACRES) =    97.66       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    905.71     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      905.7         PEAK FLOW RATE(CFS) =      31.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.49   FLOW VELOCITY(FEET/SEC.) =   4.68
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.50 =   20398.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.50 TO NODE  11410.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    953.45  DOWNSTREAM(FEET) =    914.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.66   CHANNEL SLOPE =  0.0357
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.412
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      130.64      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.92
  AVERAGE FLOW DEPTH(FEET) =   1.63   TRAVEL TIME(MIN.) =   4.68
  Tc(MIN.) =   71.78
  SUBAREA AREA(ACRES) =   130.64       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1036.35     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1036.4         PEAK FLOW RATE(CFS) =      31.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.63   FLOW VELOCITY(FEET/SEC.) =   3.92
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11410.00 =   21499.14 FEET.
```



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****************************************************************************
  FLOW PROCESS FROM NODE  11410.00 TO NODE  11411.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    914.20  DOWNSTREAM(FEET) =    740.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3015.96   CHANNEL SLOPE =  0.0576
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.391
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      299.66      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.71
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =  10.66
  Tc(MIN.) =   82.44
  SUBAREA AREA(ACRES) =   299.66       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1336.01     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1336.0         PEAK FLOW RATE(CFS) =      31.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   4.71
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11411.00 =   24515.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.43  DOWNSTREAM(FEET) =    651.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1605.97   CHANNEL SLOPE =  0.0553
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.380
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       70.41      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.63
  AVERAGE FLOW DEPTH(FEET) =   1.50   TRAVEL TIME(MIN.) =   5.78
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  Tc(MIN.) =   88.22
  SUBAREA AREA(ACRES) =    70.41       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1406.42     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1406.4         PEAK FLOW RATE(CFS) =      31.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =   4.63
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11431.00 =   26121.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S10.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      246.84   42.56  0.60( 0.60) 1.00    2415.3   11000.00
      2      302.04   69.93  0.60( 0.60) 1.00    5258.4   10850.00
      3      278.58   76.86  0.60( 0.60) 1.00    5875.7   10800.00
      4      275.62   78.38  0.60( 0.60) 1.00    6043.0   10900.00
      5      259.85   85.05  0.60( 0.60) 1.00    6684.7   10830.00
      6      230.85   90.63  0.60( 0.60) 1.00    7039.8   10910.00
      7      199.52   96.73  0.60( 0.60) 1.00    7328.8   10630.00
      8      166.91  128.46  0.60( 0.60) 1.00    9818.3   10600.00
      9      186.85  145.80  0.60( 0.60) 1.00   11703.8   10500.00
     10      189.88  155.90  0.60( 0.60) 1.00   12642.8   10710.00
     11      186.76  163.55  0.60( 0.60) 1.00   13164.4   10410.00
     12      178.30  184.07  0.60( 0.60) 1.00   14378.6   10700.00
     13      179.84  201.34  0.60( 0.60) 1.00   15393.6   10200.00
     14      179.79  201.61  0.60( 0.60) 1.00   15406.7   10400.00
     15      176.82  219.07  0.60( 0.60) 1.00   16136.8   10320.00
     16      175.38  223.88  0.60( 0.60) 1.00   16283.9   10300.00
     17      168.41  241.55  0.60( 0.60) 1.00   16554.3   10210.00
     18      142.01  351.47  0.60( 0.60) 1.00   17533.1   10100.00
    TOTAL AREA(ACRES) =    17533.1

****************************************************************************
  FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S13.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      268.72   61.89  0.60( 0.60) 1.00    3267.2   11330.00
```



```
      2      270.16   62.97  0.60( 0.60) 1.00    3354.4   11350.00
      3      280.59   73.18  0.60( 0.60) 1.00    4084.2   11300.00
      4      265.39   76.97  0.60( 0.60) 1.00    4295.4   11250.00
      5      229.34   82.28  0.60( 0.60) 1.00    4475.9   11220.00
      6      218.62   83.85  0.60( 0.60) 1.00    4522.7   11130.00
      7       68.66  142.88  0.60( 0.60) 1.00    6056.6   11201.00
      8       64.38  145.45  0.60( 0.60) 1.00    6080.4   11101.00
      9       64.37  145.54  0.60( 0.60) 1.00    6081.5   11111.00
    TOTAL AREA(ACRES) =     6081.5

****************************************************************************
  FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      268.72   61.89  0.60( 0.60) 1.00    3267.2   11330.00
      2      270.16   62.97  0.60( 0.60) 1.00    3354.4   11350.00
      3      280.59   73.18  0.60( 0.60) 1.00    4084.2   11300.00
      4      265.39   76.97  0.60( 0.60) 1.00    4295.4   11250.00
      5      229.34   82.28  0.60( 0.60) 1.00    4475.9   11220.00
      6      218.62   83.85  0.60( 0.60) 1.00    4522.7   11130.00
      7       68.66  142.88  0.60( 0.60) 1.00    6056.6   11201.00
      8       64.38  145.45  0.60( 0.60) 1.00    6080.4   11101.00
      9       64.37  145.54  0.60( 0.60) 1.00    6081.5   11111.00
    TOTAL AREA(ACRES) =      6081.5

****************************************************************************
  FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      268.72   61.89    0.432  0.60( 0.60) 1.00    3267.2   11330.00
      2      270.16   62.97    0.430  0.60( 0.60) 1.00    3354.4   11350.00
      3      280.59   73.18    0.410  0.60( 0.60) 1.00    4084.2   11300.00
      4      265.39   76.97    0.402  0.60( 0.60) 1.00    4295.4   11250.00
      5      229.34   82.28    0.391  0.60( 0.60) 1.00    4475.9   11220.00
      6      218.62   83.85    0.388  0.60( 0.60) 1.00    4522.7   11130.00
      7       68.66  142.88    0.314  0.60( 0.60) 1.00    6056.6   11201.00
      8       64.38  145.45    0.312  0.60( 0.60) 1.00    6080.4   11101.00
      9       64.37  145.54    0.312  0.60( 0.60) 1.00    6081.5   11111.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11363.00 =   42748.42 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      246.84   42.56    0.513  0.60( 0.60) 1.00    2415.3   11000.00
      2      302.04   69.93    0.416  0.60( 0.60) 1.00    5258.4   10850.00
      3      278.58   76.86    0.402  0.60( 0.60) 1.00    5875.7   10800.00
      4      275.62   78.38    0.399  0.60( 0.60) 1.00    6043.0   10900.00
      5      259.85   85.05    0.386  0.60( 0.60) 1.00    6684.7   10830.00
```

6	230.85	90.63	0.375	0.60(0.60)	1.00	7039.8	10910.00
7	199.52	96.73	0.366	0.60(0.60)	1.00	7328.8	10630.00
8	166.91	128.46	0.326	0.60(0.60)	1.00	9818.3	10600.00
9	186.85	145.80	0.311	0.60(0.60)	1.00	11703.8	10500.00
10	189.88	155.90	0.303	0.60(0.60)	1.00	12642.8	10710.00
11	186.76	163.55	0.297	0.60(0.60)	1.00	13164.4	10410.00
12	178.30	184.07	0.281	0.60(0.60)	1.00	14378.6	10700.00
13	179.84	201.34	0.275	0.60(0.60)	1.00	15393.6	10200.00
14	179.79	201.61	0.275	0.60(0.60)	1.00	15406.7	10400.00
15	176.82	219.07	0.268	0.60(0.60)	1.00	16136.8	10320.00
16	175.38	223.88	0.266	0.60(0.60)	1.00	16283.9	10300.00
17	168.41	241.55	0.260	0.60(0.60)	1.00	16554.3	10210.00
18	142.01	351.47	0.218	0.60(0.60)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	466.03	42.56	0.513	0.60(0.60)	1.00	4662.1	11000.00
2	554.55	61.89	0.432	0.60(0.60)	1.00	7690.2	11330.00
3	558.16	62.97	0.430	0.60(0.60)	1.00	7889.5	11350.00
4	579.31	69.93	0.416	0.60(0.60)	1.00	9110.5	10850.00
5	571.64	73.18	0.410	0.60(0.60)	1.00	9631.8	11300.00
6	544.40	76.86	0.402	0.60(0.60)	1.00	10165.2	10800.00
7	543.76	76.97	0.402	0.60(0.60)	1.00	10183.0	11250.00
8	531.43	78.38	0.399	0.60(0.60)	1.00	10386.4	10900.00
9	495.75	82.28	0.391	0.60(0.60)	1.00	10893.5	11220.00
10	481.33	83.85	0.388	0.60(0.60)	1.00	11091.2	11130.00
11	475.40	85.05	0.386	0.60(0.60)	1.00	11238.8	10830.00
12	432.23	90.63	0.375	0.60(0.60)	1.00	11738.9	10910.00
13	385.42	96.73	0.366	0.60(0.60)	1.00	12186.2	10630.00
14	272.18	128.46	0.326	0.60(0.60)	1.00	15500.3	10600.00
15	252.14	142.88	0.314	0.60(0.60)	1.00	17442.0	11201.00
16	250.82	145.45	0.312	0.60(0.60)	1.00	17745.3	11101.00
17	250.93	145.54	0.312	0.60(0.60)	1.00	17756.9	11111.00
18	251.18	145.80	0.311	0.60(0.60)	1.00	17785.3	10500.00
19	252.47	155.90	0.303	0.60(0.60)	1.00	18724.2	10710.00
20	248.04	163.55	0.297	0.60(0.60)	1.00	19245.8	10410.00
21	236.42	184.07	0.281	0.60(0.60)	1.00	20460.0	10700.00
22	236.62	201.34	0.275	0.60(0.60)	1.00	21475.0	10200.00
23	236.55	201.61	0.275	0.60(0.60)	1.00	21488.2	10400.00
24	232.22	219.07	0.268	0.60(0.60)	1.00	22218.3	10320.00
25	230.40	223.88	0.266	0.60(0.60)	1.00	22365.3	10300.00
26	222.05	241.55	0.260	0.60(0.60)	1.00	22635.7	10210.00
27	187.08	351.47	0.218	0.60(0.60)	1.00	23614.5	10100.00

TOTAL AREA(ACRES) = 23614.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 579.31 Tc(MIN.) = 69.932
EFFECTIVE AREA(ACRES) = 9110.49 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 23614.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

****
FLOW PROCESS FROM NODE 11363.00 TO NODE 11431.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========

ELEVATION DATA: UPSTREAM(FEET) = 678.93 DOWNSTREAM(FEET) = 651.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 2069.94 CHANNEL SLOPE = 0.0132
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.405
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.16	0.60	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 579.40
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.44
AVERAGE FLOW DEPTH(FEET) = 5.48 TRAVEL TIME(MIN.) = 5.35
Tc(MIN.) = 75.29
SUBAREA AREA(ACRES) = 165.16 SUBAREA RUNOFF(CFS) = 0.18
EFFECTIVE AREA(ACRES) = 9275.65 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 23779.7 PEAK FLOW RATE(CFS) = 579.31
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.48 FLOW VELOCITY(FEET/SEC.) = 6.44
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

****
FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	466.03	48.22	0.481	0.60(0.60)	1.00	4827.2	11000.00
2	554.55	67.31	0.421	0.60(0.60)	1.00	7855.4	11330.00
3	558.16	68.37	0.419	0.60(0.60)	1.00	8054.6	11350.00
4	579.31	75.29	0.405	0.60(0.60)	1.00	9275.6	10850.00
5	571.64	78.56	0.399	0.60(0.60)	1.00	9797.0	11300.00
6	544.40	82.31	0.391	0.60(0.60)	1.00	10330.3	10800.00
7	543.76	82.41	0.391	0.60(0.60)	1.00	10348.2	11250.00
8	531.43	83.85	0.388	0.60(0.60)	1.00	10551.5	10900.00
9	495.75	87.85	0.380	0.60(0.60)	1.00	11058.7	11220.00
10	481.33	89.46	0.377	0.60(0.60)	1.00	11256.4	11130.00
11	475.40	90.68	0.375	0.60(0.60)	1.00	11404.0	10830.00
12	432.23	96.40	0.367	0.60(0.60)	1.00	11904.1	10910.00
13	385.42	102.67	0.358	0.60(0.60)	1.00	12351.4	10630.00
14	272.18	134.93	0.321	0.60(0.60)	1.00	15665.5	10600.00
15	252.14	149.47	0.308	0.60(0.60)	1.00	17607.1	11201.00
16	250.82	152.05	0.306	0.60(0.60)	1.00	17910.5	11101.00
17	250.93	152.14	0.306	0.60(0.60)	1.00	17922.0	11111.00
18	251.18	152.40	0.306	0.60(0.60)	1.00	17950.4	10500.00

19	252.47	162.49	0.298	0.60(0.60)	1.00	18889.4	10710.00
20	248.04	170.17	0.291	0.60(0.60)	1.00	19411.0	10410.00
21	236.42	190.76	0.279	0.60(0.60)	1.00	20625.2	10700.00
22	236.62	208.05	0.272	0.60(0.60)	1.00	21640.2	10200.00
23	236.55	208.30	0.272	0.60(0.60)	1.00	21653.3	10400.00
24	232.22	225.80	0.266	0.60(0.60)	1.00	22383.5	10320.00
25	230.40	230.61	0.264	0.60(0.60)	1.00	22530.5	10300.00
26	222.05	248.35	0.257	0.60(0.60)	1.00	22800.9	10210.00
27	187.08	358.57	0.216	0.60(0.60)	1.00	23779.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.18	88.22	0.380	0.60(0.60)	1.00	1406.4	11401.00

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	487.63	48.22	0.481	0.60(0.60)	1.00	5595.9	11000.00
2	580.96	67.31	0.421	0.60(0.60)	1.00	8928.4	11330.00
3	584.85	68.37	0.419	0.60(0.60)	1.00	9144.6	11350.00
4	607.73	75.29	0.405	0.60(0.60)	1.00	10475.9	10850.00
5	600.82	78.56	0.399	0.60(0.60)	1.00	11049.3	11300.00
6	574.40	82.31	0.391	0.60(0.60)	1.00	11642.5	10800.00
7	573.78	82.41	0.391	0.60(0.60)	1.00	11661.9	11250.00
8	561.75	83.85	0.388	0.60(0.60)	1.00	11888.3	10900.00
9	526.86	87.85	0.380	0.60(0.60)	1.00	12459.2	11220.00
10	523.61	88.22	0.380	0.60(0.60)	1.00	12510.6	11401.00
11	512.31	89.46	0.377	0.60(0.60)	1.00	12662.8	11130.00
12	506.21	90.68	0.375	0.60(0.60)	1.00	12810.4	10830.00
13	462.36	96.40	0.367	0.60(0.60)	1.00	13310.5	10910.00
14	414.81	102.67	0.358	0.60(0.60)	1.00	13757.8	10630.00
15	298.52	134.93	0.321	0.60(0.60)	1.00	17071.9	10600.00
16	277.48	149.47	0.308	0.60(0.60)	1.00	19013.5	11201.00
17	275.98	152.05	0.306	0.60(0.60)	1.00	19316.9	11101.00
18	276.08	152.14	0.306	0.60(0.60)	1.00	19328.4	11111.00
19	276.32	152.40	0.306	0.60(0.60)	1.00	19356.9	10500.00
20	276.92	162.49	0.298	0.60(0.60)	1.00	20295.8	10710.00
21	271.96	170.17	0.291	0.60(0.60)	1.00	20817.4	10410.00
22	259.34	190.76	0.279	0.60(0.60)	1.00	22031.6	10700.00
23	259.00	208.05	0.272	0.60(0.60)	1.00	23046.6	10200.00
24	258.92	208.30	0.272	0.60(0.60)	1.00	23059.7	10400.00
25	254.04	225.80	0.266	0.60(0.60)	1.00	23789.9	10320.00
26	252.08	230.61	0.264	0.60(0.60)	1.00	23936.9	10300.00
27	243.18	248.35	0.257	0.60(0.60)	1.00	24207.3	10210.00
28	204.78	358.57	0.216	0.60(0.60)	1.00	25186.1	10100.00

TOTAL AREA(ACRES) = 25186.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 607.73 Tc(MIN.) = 75.286
EFFECTIVE AREA(ACRES) = 10475.87 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25186.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

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END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 25186.1 TC(MIN.) = 75.29
EFFECTIVE AREA(ACRES) = 10475.87 AREA-AVERAGED Fm(INCH/HR)= 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.999
PEAK FLOW RATE(CFS) = 607.73

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	487.63	48.22	0.481	0.60(0.60)	1.00	5595.9	11000.00
2	580.96	67.31	0.421	0.60(0.60)	1.00	8928.4	11330.00
3	584.85	68.37	0.419	0.60(0.60)	1.00	9144.6	11350.00
4	607.73	75.29	0.405	0.60(0.60)	1.00	10475.9	10850.00
5	600.82	78.56	0.399	0.60(0.60)	1.00	11049.3	11300.00
6	574.40	82.31	0.391	0.60(0.60)	1.00	11642.5	10800.00
7	573.78	82.41	0.391	0.60(0.60)	1.00	11661.9	11250.00
8	561.75	83.85	0.388	0.60(0.60)	1.00	11888.3	10900.00
9	526.86	87.85	0.380	0.60(0.60)	1.00	12459.2	11220.00
10	523.61	88.22	0.380	0.60(0.60)	1.00	12510.6	11401.00
11	512.31	89.46	0.377	0.60(0.60)	1.00	12662.8	11130.00
12	506.21	90.68	0.375	0.60(0.60)	1.00	12810.4	10830.00
13	462.36	96.40	0.367	0.60(0.60)	1.00	13310.5	10910.00
14	414.81	102.67	0.358	0.60(0.60)	1.00	13757.8	10630.00
15	298.52	134.93	0.321	0.60(0.60)	1.00	17071.9	10600.00
16	277.48	149.47	0.308	0.60(0.60)	1.00	19013.5	11201.00
17	275.98	152.05	0.306	0.60(0.60)	1.00	19316.9	11101.00
18	276.08	152.14	0.306	0.60(0.60)	1.00	19328.4	11111.00
19	276.32	152.40	0.306	0.60(0.60)	1.00	19356.9	10500.00
20	276.92	162.49	0.298	0.60(0.60)	1.00	20295.8	10710.00
21	271.96	170.17	0.291	0.60(0.60)	1.00	20817.4	10410.00
22	259.34	190.76	0.279	0.60(0.60)	1.00	22031.6	10700.00
23	259.00	208.05	0.272	0.60(0.60)	1.00	23046.6	10200.00
24	258.92	208.30	0.272	0.60(0.60)	1.00	23059.7	10400.00
25	254.04	225.80	0.266	0.60(0.60)	1.00	23789.9	10320.00
26	252.08	230.61	0.264	0.60(0.60)	1.00	23936.9	10300.00
27	243.18	248.35	0.257	0.60(0.60)	1.00	24207.3	10210.00
28	204.78	358.57	0.216	0.60(0.60)	1.00	25186.1	10100.00

==========

==========

END OF RATIONAL METHOD ANALYSIS

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S15.DAT
  TIME/DATE OF STUDY: 10:40 04/01/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.960
   2)   10.00;  1.307
   3)   15.00;  0.984
   4)   20.00;  0.797
   5)   25.00;  0.682
   6)   30.00;  0.603
   7)   40.00;  0.521
   8)   50.00;  0.464
   9)   60.00;  0.427
  10)   90.00;  0.366
  11)  120.00;  0.323
  12)  180.00;  0.273
  13)  360.00;  0.205
  14) 1440.00;  0.092
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  11500.00 TO NODE  11501.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   352.85
  ELEVATION DATA: UPSTREAM(FEET) =   1891.25  DOWNSTREAM(FEET) =   1665.22

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.064
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.560
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        1.58      0.60     1.000     0    8.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.37
  TOTAL AREA(ACRES) =      1.58   PEAK FLOW RATE(CFS) =      1.37

 ************************************************************************
  FLOW PROCESS FROM NODE  11501.00 TO NODE  11502.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1665.22  DOWNSTREAM(FEET) =   1423.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.67   CHANNEL SLOPE =  0.3849
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.316
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        6.84      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.60
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   1.87
  Tc(MIN.) =    9.93
  SUBAREA AREA(ACRES) =     6.84       SUBAREA RUNOFF(CFS) =    4.41
  EFFECTIVE AREA(ACRES) =      8.42     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.4         PEAK FLOW RATE(CFS) =       5.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   6.23
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11502.00 =     980.52 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  11502.00 TO NODE  11503.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1423.64  DOWNSTREAM(FEET) =   1258.86
 CHANNEL LENGTH THRU SUBAREA(FEET) =   937.16   CHANNEL SLOPE =  0.1758
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.133
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       28.16      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.28
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.67
 AVERAGE FLOW DEPTH(FEET) =   0.85   TRAVEL TIME(MIN.) =   2.76
 Tc(MIN.) =   12.69
 SUBAREA AREA(ACRES) =    28.16       SUBAREA RUNOFF(CFS) =   13.52
 EFFECTIVE AREA(ACRES) =     36.58     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       36.6         PEAK FLOW RATE(CFS) =      17.56

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   6.20
 LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11503.00 =    1917.68 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11503.00 TO NODE  11504.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1258.86  DOWNSTREAM(FEET) =   1009.04
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.29   CHANNEL SLOPE =  0.1298
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.875
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       69.67      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.14
 AVERAGE FLOW DEPTH(FEET) =   1.20   TRAVEL TIME(MIN.) =   5.22
 Tc(MIN.) =   17.91
 SUBAREA AREA(ACRES) =    69.67       SUBAREA RUNOFF(CFS) =   17.26
 EFFECTIVE AREA(ACRES) =    106.25     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      106.2         PEAK FLOW RATE(CFS) =      26.33

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   6.15
 LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11504.00 =    3841.97 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1009.04  DOWNSTREAM(FEET) =    593.37
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2817.91   CHANNEL SLOPE =  0.1475
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.681
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       65.12      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.58
 AVERAGE FLOW DEPTH(FEET) =   1.21   TRAVEL TIME(MIN.) =   7.14
 Tc(MIN.) =   25.05
 SUBAREA AREA(ACRES) =    65.12       SUBAREA RUNOFF(CFS) =    4.77
 EFFECTIVE AREA(ACRES) =    171.37     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      171.4         PEAK FLOW RATE(CFS) =      26.33
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   6.41
 LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S14.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      487.63   48.22  0.60( 0.60) 1.00    5595.9   11000.00
     2      584.85   68.37  0.60( 0.60) 1.00    9144.6   11350.00
     3      607.73   75.29  0.60( 0.60) 1.00   10475.9   10850.00
     4      600.82   78.56  0.60( 0.60) 1.00   11049.3   11300.00
     5      574.40   82.31  0.60( 0.60) 1.00   11642.5   10800.00
     6      526.86   87.85  0.60( 0.60) 1.00   12459.2   11220.00
     7      512.31   89.46  0.60( 0.60) 1.00   12662.8   11130.00
     8      462.36   96.40  0.60( 0.60) 1.00   13310.5   10910.00
     9      414.81  102.67  0.60( 0.60) 1.00   13757.8   10630.00
    10      298.52  134.93  0.60( 0.60) 1.00   17071.9   10600.00
    11      277.48  149.47  0.60( 0.60) 1.00   19013.5   11201.00
    12      276.32  152.40  0.60( 0.60) 1.00   19356.9   10500.00
    13      276.92  162.49  0.60( 0.60) 1.00   20295.8   10710.00
    14      271.96  170.17  0.60( 0.60) 1.00   20817.4   10410.00
    15      259.34  190.76  0.60( 0.60) 1.00   22031.6   10700.00
    16      259.00  208.05  0.60( 0.60) 1.00   23046.6   10200.00
```

```
     17      254.04  225.80  0.60( 0.60) 1.00   23789.9   10320.00
     18      252.08  230.61  0.60( 0.60) 1.00   23936.9   10300.00
     19      243.18  248.35  0.60( 0.60) 1.00   24207.3   10210.00
     20      204.78  358.57  0.60( 0.60) 1.00   25186.1   10100.00
    TOTAL AREA(ACRES) =    25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1      487.63   48.22  0.60( 0.60) 1.00    5595.9   11000.00
      2      584.85   68.37  0.60( 0.60) 1.00    9144.6   11350.00
      3      607.73   75.29  0.60( 0.60) 1.00   10475.9   10850.00
      4      600.82   78.56  0.60( 0.60) 1.00   11049.3   11300.00
      5      574.40   82.31  0.60( 0.60) 1.00   11642.5   10800.00
      6      526.86   87.85  0.60( 0.60) 1.00   12459.2   11220.00
      7      512.31   89.46  0.60( 0.60) 1.00   12662.8   11130.00
      8      462.36   96.40  0.60( 0.60) 1.00   13310.5   10910.00
      9      414.81  102.67  0.60( 0.60) 1.00   13757.8   10630.00
     10      298.52  134.93  0.60( 0.60) 1.00   17071.9   10600.00
     11      277.48  149.47  0.60( 0.60) 1.00   19013.5   11201.00
     12      276.32  152.40  0.60( 0.60) 1.00   19356.9   10500.00
     13      276.92  162.49  0.60( 0.60) 1.00   20295.8   10710.00
     14      271.96  170.17  0.60( 0.60) 1.00   20817.4   10410.00
     15      259.34  190.76  0.60( 0.60) 1.00   22031.6   10700.00
     16      259.00  208.05  0.60( 0.60) 1.00   23046.6   10200.00
     17      254.04  225.80  0.60( 0.60) 1.00   23789.9   10320.00
     18      252.08  230.61  0.60( 0.60) 1.00   23936.9   10300.00
     19      243.18  248.35  0.60( 0.60) 1.00   24207.3   10210.00
     20      204.78  358.57  0.60( 0.60) 1.00   25186.1   10100.00
    TOTAL AREA(ACRES) =     25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    651.70  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2004.08   CHANNEL SLOPE =  0.0291
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.388
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.88      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     607.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.78
```



```
  AVERAGE FLOW DEPTH(FEET) =   4.80   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   79.09
  SUBAREA AREA(ACRES) =    54.88       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  10530.75     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    25241.0         PEAK FLOW RATE(CFS) =     607.73
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.80   FLOW VELOCITY(FEET/SEC.) =   8.78
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      487.63   52.24    0.456  0.60( 0.60) 1.00    5650.8   11000.00
      2      584.85   72.21    0.402  0.60( 0.60) 1.00    9199.5   11350.00
      3      607.73   79.09    0.388  0.60( 0.60) 1.00   10530.7   10850.00
      4      600.82   82.37    0.382  0.60( 0.60) 1.00   11104.2   11300.00
      5      574.40   86.16    0.374  0.60( 0.60) 1.00   11697.3   10800.00
      6      526.86   91.79    0.363  0.60( 0.60) 1.00   12514.1   11220.00
      7      512.31   93.43    0.361  0.60( 0.60) 1.00   12717.7   11130.00
      8      462.36  100.48    0.351  0.60( 0.60) 1.00   13365.4   10910.00
      9      414.81  106.85    0.342  0.60( 0.60) 1.00   13812.7   10630.00
     10      298.52  139.47    0.307  0.60( 0.60) 1.00   17126.8   10600.00
     11      277.48  154.10    0.295  0.60( 0.60) 1.00   19068.4   11201.00
     12      276.32  157.03    0.292  0.60( 0.60) 1.00   19411.8   10500.00
     13      276.92  167.11    0.284  0.60( 0.60) 1.00   20350.7   10710.00
     14      271.96  174.82    0.277  0.60( 0.60) 1.00   20872.3   10410.00
     15      259.34  195.47    0.267  0.60( 0.60) 1.00   22086.5   10700.00
     16      259.00  212.76    0.261  0.60( 0.60) 1.00   23101.5   10200.00
     17      254.04  230.53    0.254  0.60( 0.60) 1.00   23844.8   10320.00
     18      252.08  235.35    0.252  0.60( 0.60) 1.00   23991.8   10300.00
     19      243.18  253.13    0.245  0.60( 0.60) 1.00   24262.2   10210.00
     20      204.78  363.57    0.205  0.60( 0.60) 1.00   25241.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1       26.33   25.05    0.681  0.60( 0.60) 1.00     171.4   11500.00
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      375.87   25.05    0.681  0.60( 0.60) 1.00    2881.1   11500.00
      2      487.63   52.24    0.456  0.60( 0.60) 1.00    5822.2   11000.00
      3      584.85   72.21    0.402  0.60( 0.60) 1.00    9370.8   11350.00
      4      607.73   79.09    0.388  0.60( 0.60) 1.00   10702.1   10850.00
```

```
      5      600.82   82.37    0.382  0.60( 0.60) 1.00   11275.6   11300.00
      6      574.40   86.16    0.374  0.60( 0.60) 1.00   11868.7   10800.00
      7      526.86   91.79    0.363  0.60( 0.60) 1.00   12685.5   11220.00
      8      512.31   93.43    0.361  0.60( 0.60) 1.00   12889.0   11130.00
      9      462.36  100.48    0.351  0.60( 0.60) 1.00   13536.7   10910.00
     10      414.81  106.85    0.342  0.60( 0.60) 1.00   13984.1   10630.00
     11      298.52  139.47    0.307  0.60( 0.60) 1.00   17298.1   10600.00
     12      277.48  154.10    0.295  0.60( 0.60) 1.00   19239.8   11201.00
     13      276.32  157.03    0.292  0.60( 0.60) 1.00   19583.1   10500.00
     14      276.92  167.11    0.284  0.60( 0.60) 1.00   20522.1   10710.00
     15      271.96  174.82    0.277  0.60( 0.60) 1.00   21043.6   10410.00
     16      259.34  195.47    0.267  0.60( 0.60) 1.00   22257.9   10700.00
     17      259.00  212.76    0.261  0.60( 0.60) 1.00   23272.9   10200.00
     18      254.04  230.53    0.254  0.60( 0.60) 1.00   24016.1   10320.00
     19      252.08  235.35    0.252  0.60( 0.60) 1.00   24163.2   10300.00
     20      243.18  253.13    0.245  0.60( 0.60) 1.00   24433.6   10210.00
     21      204.78  363.57    0.205  0.60( 0.60) 1.00   25412.4   10100.00
   TOTAL AREA(ACRES) =     25412.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      607.73  Tc(MIN.) =   79.091
  EFFECTIVE AREA(ACRES) =  10702.12  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    25412.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11520.00 TO NODE  11540.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    593.37  DOWNSTREAM(FEET) =    577.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1515.75   CHANNEL SLOPE =  0.0103
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.381
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      100.60      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     607.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.03
  AVERAGE FLOW DEPTH(FEET) =   5.37   TRAVEL TIME(MIN.) =   3.59
  Tc(MIN.) =   82.68
  SUBAREA AREA(ACRES) =   100.60       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  10802.72     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    25513.0         PEAK FLOW RATE(CFS) =     607.73
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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```
  DEPTH(FEET) =  5.37   FLOW VELOCITY(FEET/SEC.) =   7.03
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11540.00 =   74743.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11520.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   82.68
  RAINFALL INTENSITY(INCH/HR) =   0.38
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   10802.72
  TOTAL STREAM AREA(ACRES) =   25512.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     607.73

****************************************************************************
  FLOW PROCESS FROM NODE  11530.00 TO NODE  11531.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   278.68
  ELEVATION DATA: UPSTREAM(FEET) =   1593.31  DOWNSTREAM(FEET) =   1523.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.844
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.458
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"               -        1.18      0.60     1.000     0    8.84
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      1.18   PEAK FLOW RATE(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE  11531.00 TO NODE  11532.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1523.14  DOWNSTREAM(FEET) =   1297.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =   698.37   CHANNEL SLOPE =  0.3230
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.236
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.32      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.16
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =   11.10
  SUBAREA AREA(ACRES) =     8.32       SUBAREA RUNOFF(CFS) =    4.76
  EFFECTIVE AREA(ACRES) =      9.50     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.5         PEAK FLOW RATE(CFS) =       5.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   5.79
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11532.00 =     977.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11532.00 TO NODE  11533.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1297.56  DOWNSTREAM(FEET) =   1134.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.17   CHANNEL SLOPE =  0.1693
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.037
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.50      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.20
  AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =   3.09
  Tc(MIN.) =   14.18
  SUBAREA AREA(ACRES) =    18.50       SUBAREA RUNOFF(CFS) =    7.27
  EFFECTIVE AREA(ACRES) =     28.00     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.0         PEAK FLOW RATE(CFS) =      11.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.82   FLOW VELOCITY(FEET/SEC.) =   5.44
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11533.00 =    1939.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11533.00 TO NODE  11534.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1134.68  DOWNSTREAM(FEET) =   1002.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.78   CHANNEL SLOPE =  0.1379
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.919
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.44      0.60     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.22
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   2.56
  Tc(MIN.) =   16.75
  SUBAREA AREA(ACRES) =    98.44       SUBAREA RUNOFF(CFS) =   28.24
  EFFECTIVE AREA(ACRES) =    126.44     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      126.4         PEAK FLOW RATE(CFS) =      36.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.33   FLOW VELOCITY(FEET/SEC.) =   6.81
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11534.00 =    2896.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11534.00 TO NODE  11535.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1002.72  DOWNSTREAM(FEET) =    816.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2160.78   CHANNEL SLOPE =  0.0863
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.734
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.87      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.01
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   5.99
  Tc(MIN.) =   22.74
  SUBAREA AREA(ACRES) =   134.87       SUBAREA RUNOFF(CFS) =   16.29
  EFFECTIVE AREA(ACRES) =    261.31     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      261.3         PEAK FLOW RATE(CFS) =      36.27
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.46   FLOW VELOCITY(FEET/SEC.) =   5.67
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11535.00 =    5056.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    816.20  DOWNSTREAM(FEET) =    577.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3109.20   CHANNEL SLOPE =  0.0767
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.584
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       78.24      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.27
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.44
 AVERAGE FLOW DEPTH(FEET) =   1.49   TRAVEL TIME(MIN.) =   9.52
 Tc(MIN.) =   32.26
 SUBAREA AREA(ACRES) =    78.24       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    339.55     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      339.5         PEAK FLOW RATE(CFS) =      36.27
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.49   FLOW VELOCITY(FEET/SEC.) =   5.44
 LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11540.00 =    8165.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   32.26
 RAINFALL INTENSITY(INCH/HR) =   0.58
 AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     339.55
 TOTAL STREAM AREA(ACRES) =     339.55
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      36.27

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      375.87   29.10    0.617  0.60( 0.60) 1.00    2981.7   11500.00
     1      487.63   56.03    0.442  0.60( 0.60) 1.00    5922.8   11000.00
     1      584.85   75.84    0.395  0.60( 0.60) 1.00    9471.4   11350.00
     1      607.73   82.68    0.381  0.60( 0.60) 1.00   10802.7   10850.00
     1      600.82   85.97    0.374  0.60( 0.60) 1.00   11376.2   11300.00
     1      574.40   89.81    0.366  0.60( 0.60) 1.00   11969.3   10800.00
     1      526.86   95.51    0.358  0.60( 0.60) 1.00   12786.1   11220.00
     1      512.31   97.18    0.356  0.60( 0.60) 1.00   12989.6   11130.00
     1      462.36  104.33    0.345  0.60( 0.60) 1.00   13637.3   10910.00
     1      414.81  110.80    0.336  0.60( 0.60) 1.00   14084.7   10630.00
     1      298.52  143.77    0.303  0.60( 0.60) 1.00   17398.7   10600.00
     1      277.48  158.47    0.291  0.60( 0.60) 1.00   19340.4   11201.00
     1      276.32  161.41    0.288  0.60( 0.60) 1.00   19683.7   10500.00
     1      276.92  171.50    0.280  0.60( 0.60) 1.00   20622.7   10710.00
     1      271.96  179.22    0.274  0.60( 0.60) 1.00   21144.2   10410.00
```



```
     1      259.34  199.92    0.265  0.60( 0.60) 1.00   22358.5   10700.00
     1      259.00  217.21    0.259  0.60( 0.60) 1.00   23373.5   10200.00
     1      254.04  235.00    0.252  0.60( 0.60) 1.00   24116.7   10320.00
     1      252.08  239.83    0.250  0.60( 0.60) 1.00   24263.8   10300.00
     1      243.18  257.66    0.244  0.60( 0.60) 1.00   24534.2   10210.00
     1      204.78  368.28    0.204  0.60( 0.60) 1.00   25513.0   10100.00
     2       36.27   32.26    0.584  0.60( 0.60) 1.00     339.5   11530.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      410.42   29.10    0.617  0.60( 0.60) 1.00    3288.1   11500.00
     2      425.24   32.26    0.584  0.60( 0.60) 1.00    3665.9   11530.00
     3      515.04   56.03    0.442  0.60( 0.60) 1.00    6262.3   11000.00
     4      609.35   75.84    0.395  0.60( 0.60) 1.00    9811.0   11350.00
     5      631.37   82.68    0.381  0.60( 0.60) 1.00   11142.3   10850.00
     6      624.04   85.97    0.374  0.60( 0.60) 1.00   11715.7   11300.00
     7      597.13   89.81    0.366  0.60( 0.60) 1.00   12308.9   10800.00
     8      549.09   95.51    0.358  0.60( 0.60) 1.00   13125.6   11220.00
     9      534.38   97.18    0.356  0.60( 0.60) 1.00   13329.2   11130.00
    10      483.80  104.33    0.345  0.60( 0.60) 1.00   13976.9   10910.00
    11      435.68  110.80    0.336  0.60( 0.60) 1.00   14424.2   10630.00
    12      317.33  143.77    0.303  0.60( 0.60) 1.00   17738.3   10600.00
    13      295.53  158.47    0.291  0.60( 0.60) 1.00   19679.9   11201.00
    14      294.22  161.41    0.288  0.60( 0.60) 1.00   20023.3   10500.00
    15      294.30  171.50    0.280  0.60( 0.60) 1.00   20962.2   10710.00
    16      288.94  179.22    0.274  0.60( 0.60) 1.00   21483.8   10410.00
    17      275.81  199.92    0.265  0.60( 0.60) 1.00   22698.0   10700.00
    18      275.07  217.21    0.259  0.60( 0.60) 1.00   23713.0   10200.00
    19      269.70  235.00    0.252  0.60( 0.60) 1.00   24456.3   10320.00
    20      267.62  239.83    0.250  0.60( 0.60) 1.00   24603.3   10300.00
    21      258.30  257.66    0.244  0.60( 0.60) 1.00   24873.7   10210.00
    22      217.45  368.28    0.204  0.60( 0.60) 1.00   25852.5   10100.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     631.37    Tc(MIN.) =    82.68
 EFFECTIVE AREA(ACRES) =   11142.27   AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =    25852.5
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11540.00 =   74743.79 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11540.00 TO NODE  11541.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    577.77  DOWNSTREAM(FEET) =    556.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.36   CHANNEL SLOPE =  0.0104
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.371
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -      389.46      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     631.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.12
  AVERAGE FLOW DEPTH(FEET) =   5.43   TRAVEL TIME(MIN.) =   4.80
  Tc(MIN.) =   87.49
  SUBAREA AREA(ACRES) =   389.46       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  11531.73     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    26242.0         PEAK FLOW RATE(CFS) =     631.37
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.43   FLOW VELOCITY(FEET/SEC.) =   7.12
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11541.00 =   76797.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11541.00 TO NODE  11542.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.39  DOWNSTREAM(FEET) =    523.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3267.94   CHANNEL SLOPE =  0.0101
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.359
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      330.30      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     631.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.06
  AVERAGE FLOW DEPTH(FEET) =   5.46   TRAVEL TIME(MIN.) =   7.71
  Tc(MIN.) =   95.20
  SUBAREA AREA(ACRES) =   330.30       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  11862.03     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    26572.3         PEAK FLOW RATE(CFS) =     631.37
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.46   FLOW VELOCITY(FEET/SEC.) =   7.06
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11542.00 =   80065.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11542.00 TO NODE  11543.00 IS CODE =  51
```



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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    523.29  DOWNSTREAM(FEET) =    493.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2857.94   CHANNEL SLOPE =  0.0104
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.349
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      285.11      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     631.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.12
  AVERAGE FLOW DEPTH(FEET) =   5.44   TRAVEL TIME(MIN.) =   6.69
  Tc(MIN.) =  101.89
  SUBAREA AREA(ACRES) =   285.11       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  12147.14     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    26857.4         PEAK FLOW RATE(CFS) =     631.37
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.44   FLOW VELOCITY(FEET/SEC.) =   7.12
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11543.00 =   82923.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11543.00 TO NODE  11544.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    493.61  DOWNSTREAM(FEET) =    480.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.01   CHANNEL SLOPE =  0.0068
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.341
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      303.63      0.60     0.987     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.987
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     631.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.08
  AVERAGE FLOW DEPTH(FEET) =   5.89   TRAVEL TIME(MIN.) =   5.38
  Tc(MIN.) =  107.27
  SUBAREA AREA(ACRES) =   303.63       SUBAREA RUNOFF(CFS) =    1.21
  EFFECTIVE AREA(ACRES) =  12450.77     AREA-AVERAGED Fm(INCH/HR) =   0.60
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    27161.0         PEAK FLOW RATE(CFS) =     631.37
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.88   FLOW VELOCITY(FEET/SEC.) =   6.09
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11544.00 =   84886.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11544.00 TO NODE  11545.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    480.21  DOWNSTREAM(FEET) =    456.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1914.49   CHANNEL SLOPE =  0.0122
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.335
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      184.16      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     631.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.56
  AVERAGE FLOW DEPTH(FEET) =   5.28   TRAVEL TIME(MIN.) =   4.22
  Tc(MIN.) =  111.49
  SUBAREA AREA(ACRES) =   184.16       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  12634.93     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    27345.2         PEAK FLOW RATE(CFS) =     631.37
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.28   FLOW VELOCITY(FEET/SEC.) =   7.56
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11545.00 =   86800.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    456.90  DOWNSTREAM(FEET) =    436.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2322.79   CHANNEL SLOPE =  0.0089
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.327
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.95      0.60     0.844     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.844
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     634.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.74
  AVERAGE FLOW DEPTH(FEET) =   5.60   TRAVEL TIME(MIN.) =   5.75
  Tc(MIN.) =  117.24
  SUBAREA AREA(ACRES) =   151.95       SUBAREA RUNOFF(CFS) =    6.98
  EFFECTIVE AREA(ACRES) =  12786.88     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    27497.1         PEAK FLOW RATE(CFS) =     631.37
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.60   FLOW VELOCITY(FEET/SEC.) =   6.72
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    27497.1  TC(MIN.) =    117.24
  EFFECTIVE AREA(ACRES) =  12786.88  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.997
  PEAK FLOW RATE(CFS)   =     631.37

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      410.42   67.60    0.412  0.60( 0.60) 0.99    4932.7   11500.00
      2      425.24   70.41    0.406  0.60( 0.60) 0.99    5310.6   11530.00
      3      515.04   92.40    0.363  0.60( 0.60) 1.00    7906.9   11000.00
      4      609.35  110.72    0.336  0.60( 0.60) 1.00   11455.6   11350.00
      5      631.37  117.24    0.327  0.60( 0.60) 1.00   12786.9   10850.00
      6      624.04  120.63    0.322  0.60( 0.60) 1.00   13360.4   11300.00
      7      597.13  124.86    0.319  0.60( 0.60) 1.00   13953.5   10800.00
      8      549.09  131.30    0.314  0.60( 0.60) 1.00   14770.2   11220.00
      9      534.38  133.22    0.312  0.60( 0.60) 1.00   14973.8   11130.00
     10      483.80  141.26    0.305  0.60( 0.60) 1.00   15621.5   10910.00
     11      435.68  148.71    0.299  0.60( 0.60) 1.00   16068.8   10630.00
     12      317.33  184.82    0.271  0.60( 0.60) 1.00   19382.9   10600.00
     13      295.53  200.26    0.265  0.60( 0.60) 1.00   21324.6   11201.00
     14      294.22  203.23    0.264  0.60( 0.60) 1.00   21667.9   10500.00
     15      294.30  213.31    0.260  0.60( 0.60) 1.00   22606.8   10710.00
     16      288.94  221.25    0.257  0.60( 0.60) 1.00   23128.4   10410.00
     17      275.81  242.43    0.249  0.60( 0.60) 1.00   24342.6   10700.00
     18      275.07  259.73    0.243  0.60( 0.60) 1.00   25357.6   10200.00
     19      269.70  277.71    0.236  0.60( 0.60) 1.00   26100.9   10320.00
     20      267.62  282.66    0.234  0.60( 0.60) 1.00   26247.9   10300.00
     21      258.30  300.87    0.227  0.60( 0.60) 1.00   26518.3   10210.00
     22      217.45  413.40    0.199  0.60( 0.60) 1.00   27497.1   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S16.DAT
  TIME/DATE OF STUDY: 10:40 04/01/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.960
   2)   10.00;  1.307
   3)   15.00;  0.984
   4)   20.00;  0.797
   5)   25.00;  0.682
   6)   30.00;  0.603
   7)   40.00;  0.521
   8)   50.00;  0.464
   9)   60.00;  0.427
  10)   90.00;  0.366
  11)  120.00;  0.323
  12)  180.00;  0.273
  13)  360.00;  0.205
  14) 1440.00;  0.092
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  11600.00 TO NODE  11601.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.21
  ELEVATION DATA: UPSTREAM(FEET) =   3061.08  DOWNSTREAM(FEET) =   2962.88

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.120
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.299
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.79      0.60     1.000     0   10.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.13
  TOTAL AREA(ACRES) =      1.79   PEAK FLOW RATE(CFS) =      1.13

 ************************************************************************
  FLOW PROCESS FROM NODE  11601.00 TO NODE  11602.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.88  DOWNSTREAM(FEET) =   2839.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =   548.33   CHANNEL SLOPE =  0.2252
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.156
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        4.88      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.11
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   12.35
  SUBAREA AREA(ACRES) =     4.88       SUBAREA RUNOFF(CFS) =    2.44
  EFFECTIVE AREA(ACRES) =      6.67     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =       3.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   4.47
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11602.00 =     938.54 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  11602.00 TO NODE  11603.00 IS CODE =  51
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
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 ELEVATION DATA: UPSTREAM(FEET) =   2839.39  DOWNSTREAM(FEET) =   2697.55
 CHANNEL LENGTH THRU SUBAREA(FEET) =   976.87   CHANNEL SLOPE =  0.1452
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.957
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       31.42      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.50
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.81
 AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =   3.39
 Tc(MIN.) =   15.73
 SUBAREA AREA(ACRES) =    31.42       SUBAREA RUNOFF(CFS) =   10.09
 EFFECTIVE AREA(ACRES) =     38.09     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       38.1         PEAK FLOW RATE(CFS) =      12.23

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   5.26
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11603.00 =    1915.41 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11603.00 TO NODE  11604.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2697.55  DOWNSTREAM(FEET) =   2598.90
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1887.15   CHANNEL SLOPE =  0.0523
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.708
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       72.03      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.26
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.86
 AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   8.15
 Tc(MIN.) =   23.89
 SUBAREA AREA(ACRES) =    72.03       SUBAREA RUNOFF(CFS) =    6.98
 EFFECTIVE AREA(ACRES) =    110.12     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =      12.23
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =   3.59
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11604.00 =    3802.56 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11604.00 TO NODE  11605.00 IS CODE =  51
----------------------------------------------------------------------------
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 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2598.90  DOWNSTREAM(FEET) =   2464.25
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2488.89   CHANNEL SLOPE =  0.0541
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.560
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       96.28      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.23
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.64
 AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =  11.38
 Tc(MIN.) =   35.27
 SUBAREA AREA(ACRES) =    96.28       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    206.40     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      206.4         PEAK FLOW RATE(CFS) =      12.23
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   3.64
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11605.00 =    6291.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11605.00 TO NODE  11606.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2464.25  DOWNSTREAM(FEET) =   2359.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1936.71   CHANNEL SLOPE =  0.0538
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.497
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      266.26      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.23
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.64
 AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   8.86
 Tc(MIN.) =   44.13
 SUBAREA AREA(ACRES) =   266.26       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    472.66     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
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  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      472.7         PEAK FLOW RATE(CFS) =      12.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   3.64
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11606.00 =    8228.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11606.00 TO NODE  11607.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2359.99  DOWNSTREAM(FEET) =   1905.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3829.49   CHANNEL SLOPE =  0.1188
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.437
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.44      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.89
  AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =  13.04
  Tc(MIN.) =   57.17
  SUBAREA AREA(ACRES) =   132.44       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    605.10     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      605.1         PEAK FLOW RATE(CFS) =      12.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   4.89
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11607.00 =   12057.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11607.00 TO NODE  11608.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1905.15  DOWNSTREAM(FEET) =   1717.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1095.02   CHANNEL SLOPE =  0.1710
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.426
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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  USER-DEFINED               -       76.91      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.62
  AVERAGE FLOW DEPTH(FEET) =   0.85   TRAVEL TIME(MIN.) =   3.25
  Tc(MIN.) =   60.42
  SUBAREA AREA(ACRES) =    76.91       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    682.01     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      682.0         PEAK FLOW RATE(CFS) =      12.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   5.62
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11608.00 =   13152.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11608.00 TO NODE  11609.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1717.92  DOWNSTREAM(FEET) =   1516.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1480.24   CHANNEL SLOPE =  0.1362
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.416
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.91      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.15
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   4.79
  Tc(MIN.) =   65.21
  SUBAREA AREA(ACRES) =   328.91       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1010.92     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1010.9         PEAK FLOW RATE(CFS) =      12.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.89   FLOW VELOCITY(FEET/SEC.) =   5.15
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11609.00 =   14632.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11609.00 TO NODE  11610.00 IS CODE =  51
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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1516.24  DOWNSTREAM(FEET) =   1332.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.38   CHANNEL SLOPE =  0.0957
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.402
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      355.16      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.51
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   7.12
  Tc(MIN.) =   72.33
  SUBAREA AREA(ACRES) =   355.16       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1366.08     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1366.1         PEAK FLOW RATE(CFS) =      12.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   4.51
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11610.00 =   16558.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11610.00 TO NODE  11611.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1332.01  DOWNSTREAM(FEET) =   1105.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2901.03   CHANNEL SLOPE =  0.0781
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.378
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      234.59      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.18
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =  11.56
  Tc(MIN.) =   83.88
  SUBAREA AREA(ACRES) =   234.59       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1600.67     AREA-AVERAGED Fm(INCH/HR) =   0.60
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  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1600.7         PEAK FLOW RATE(CFS) =      12.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =   4.18
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11611.00 =   19459.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11611.00 TO NODE  11612.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.34  DOWNSTREAM(FEET) =   1030.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1982.46   CHANNEL SLOPE =  0.0378
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.360
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.67      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.18
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =  10.39
  Tc(MIN.) =   94.27
  SUBAREA AREA(ACRES) =   212.67       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1813.34     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1813.3         PEAK FLOW RATE(CFS) =      12.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =   3.18
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11612.00 =   21441.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.47  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3051.86   CHANNEL SLOPE =  0.0525
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.340
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      465.36      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.59
  AVERAGE FLOW DEPTH(FEET) =   1.07   TRAVEL TIME(MIN.) =  14.16
  Tc(MIN.) =  108.43
  SUBAREA AREA(ACRES) =   465.36       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2278.70     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2278.7         PEAK FLOW RATE(CFS) =      12.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =   3.59
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  108.43
  RAINFALL INTENSITY(INCH/HR) =   0.34
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2278.70
  TOTAL STREAM AREA(ACRES) =    2278.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.23

****************************************************************************
  FLOW PROCESS FROM NODE  11620.00 TO NODE  11621.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   266.64
  ELEVATION DATA: UPSTREAM(FEET) =   2567.03  DOWNSTREAM(FEET) =   2486.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.387
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.518
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        0.69      0.60     1.000     0    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.57
```



```
  TOTAL AREA(ACRES) =      0.69   PEAK FLOW RATE(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE  11621.00 TO NODE  11622.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2486.90  DOWNSTREAM(FEET) =   2424.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   712.48   CHANNEL SLOPE =  0.0870
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.114
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       3.63      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.58
  AVERAGE FLOW DEPTH(FEET) =   0.43   TRAVEL TIME(MIN.) =   4.61
  Tc(MIN.) =   12.99
  SUBAREA AREA(ACRES) =     3.63       SUBAREA RUNOFF(CFS) =    1.68
  EFFECTIVE AREA(ACRES) =      4.32     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.3         PEAK FLOW RATE(CFS) =       2.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   2.76
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11622.00 =     979.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11622.00 TO NODE  11623.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2424.91  DOWNSTREAM(FEET) =   2351.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.46   CHANNEL SLOPE =  0.0751
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.857
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      13.42      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.02
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   5.39
  Tc(MIN.) =   18.39
  SUBAREA AREA(ACRES) =    13.42       SUBAREA RUNOFF(CFS) =    3.11
  EFFECTIVE AREA(ACRES) =     17.74     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.7         PEAK FLOW RATE(CFS) =       4.11
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   3.14
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11623.00 =    1956.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11623.00 TO NODE  11624.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2351.48  DOWNSTREAM(FEET) =   2317.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.96   CHANNEL SLOPE =  0.0355
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.686
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.02      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.46
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   6.42
  Tc(MIN.) =   24.81
  SUBAREA AREA(ACRES) =    16.02       SUBAREA RUNOFF(CFS) =    1.25
  EFFECTIVE AREA(ACRES) =     33.76     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.8         PEAK FLOW RATE(CFS) =       4.11
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   2.37
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.00 =    2904.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.00 TO NODE  11624.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2317.87  DOWNSTREAM(FEET) =   2292.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   758.23   CHANNEL SLOPE =  0.0337
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.601
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.93      0.60     0.984     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.34
  AVERAGE FLOW DEPTH(FEET) =   0.79   TRAVEL TIME(MIN.) =   5.40
  Tc(MIN.) =   30.21
  SUBAREA AREA(ACRES) =    32.93       SUBAREA RUNOFF(CFS) =    0.33
  EFFECTIVE AREA(ACRES) =     66.69     AREA-AVERAGED Fm(INCH/HR) =   0.60
```



```
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =       4.11
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =   2.32
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.50 =    3662.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.50 TO NODE  11625.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2292.33  DOWNSTREAM(FEET) =   2256.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1098.98   CHANNEL SLOPE =  0.0325
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.536
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       48.16      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.29
  AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =   8.00
  Tc(MIN.) =   38.21
  SUBAREA AREA(ACRES) =    48.16       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    114.85     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      114.9         PEAK FLOW RATE(CFS) =       4.11
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =   2.29
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11625.00 =    4761.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11625.00 TO NODE  11626.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2256.59  DOWNSTREAM(FEET) =   2104.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.93   CHANNEL SLOPE =  0.0739
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.475
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.15      0.60     0.950     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.950
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.47
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   9.87
  Tc(MIN.) =   48.08
  SUBAREA AREA(ACRES) =   212.15       SUBAREA RUNOFF(CFS) =    4.53
  EFFECTIVE AREA(ACRES) =    327.00     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      327.0         PEAK FLOW RATE(CFS) =       4.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   3.25
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11626.00 =    6818.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11626.00 TO NODE  11627.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2104.66  DOWNSTREAM(FEET) =   1837.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2716.08   CHANNEL SLOPE =  0.0985
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.425
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.74      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.57
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =  12.68
  Tc(MIN.) =   60.76
  SUBAREA AREA(ACRES) =   147.74       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    474.74     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.98
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      474.7         PEAK FLOW RATE(CFS) =       4.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   3.57
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11627.00 =    9534.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11627.00 TO NODE  11628.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1837.03  DOWNSTREAM(FEET) =   1393.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2077.86   CHANNEL SLOPE =  0.2132
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.411
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      202.44      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.80
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   7.22
  Tc(MIN.) =   67.98
  SUBAREA AREA(ACRES) =   202.44       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    677.18     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.98
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      677.2         PEAK FLOW RATE(CFS) =       4.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   4.80
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11628.00 =   11612.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11628.00 TO NODE  11629.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1393.93  DOWNSTREAM(FEET) =   1201.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2844.34   CHANNEL SLOPE =  0.0676
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.380
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.55      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.13
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =  15.17
  Tc(MIN.) =   83.14
  SUBAREA AREA(ACRES) =   141.55       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    818.73     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
```

```
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      818.7         PEAK FLOW RATE(CFS) =       4.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   3.13
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11629.00 =   14456.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1201.61  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3807.89   CHANNEL SLOPE =  0.0870
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.349
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      106.41      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.41
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =  18.60
  Tc(MIN.) =  101.74
  SUBAREA AREA(ACRES) =   106.41       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    925.14     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      925.1         PEAK FLOW RATE(CFS) =       4.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   3.41
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11630.00 =   18264.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  101.74
  RAINFALL INTENSITY(INCH/HR) =   0.35
  AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     925.14
  TOTAL STREAM AREA(ACRES) =     925.14
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.76

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       12.23  108.43    0.340  0.60( 0.60) 1.00    2278.7   11600.00
      2        4.76  101.74    0.349  0.60( 0.59) 0.99     925.1   11620.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       16.56  101.74    0.349  0.60( 0.60) 1.00    3063.3   11620.00
      2       16.86  108.43    0.340  0.60( 0.60) 1.00    3203.8   11600.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.86    Tc(MIN.) =   108.43
  EFFECTIVE AREA(ACRES) =    3203.84   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3203.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     3203.8  TC(MIN.) =    108.43
  EFFECTIVE AREA(ACRES) =   3203.84  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.997
  PEAK FLOW RATE(CFS)   =      16.86

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       16.56  101.74    0.349  0.60( 0.60) 1.00    3063.3   11620.00
      2       16.86  108.43    0.340  0.60( 0.60) 1.00    3203.8   11600.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S17.DAT
  TIME/DATE OF STUDY: 10:40 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.960
   2)   10.00;  1.307
   3)   15.00;  0.984
   4)   20.00;  0.797
   5)   25.00;  0.682
   6)   30.00;  0.603
   7)   40.00;  0.521
   8)   50.00;  0.464
   9)   60.00;  0.427
  10)   90.00;  0.366
  11)  120.00;  0.323
  12)  180.00;  0.273
  13)  360.00;  0.205
  14) 1440.00;  0.092
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11701.00 TO NODE  11702.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   291.79
  ELEVATION DATA: UPSTREAM(FEET) =   1581.05  DOWNSTREAM(FEET) =   1496.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.753
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.470
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.72      0.60     1.000     0    8.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.13
  TOTAL AREA(ACRES) =      2.72   PEAK FLOW RATE(CFS) =      2.13

**************************************************************************
  FLOW PROCESS FROM NODE  11702.00 TO NODE  11703.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1496.25  DOWNSTREAM(FEET) =   1254.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   563.54   CHANNEL SLOPE =  0.4293
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.293
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       10.12      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.45
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   1.46
  Tc(MIN.) =   10.21
  SUBAREA AREA(ACRES) =    10.12       SUBAREA RUNOFF(CFS) =    6.32
  EFFECTIVE AREA(ACRES) =     12.84     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.8         PEAK FLOW RATE(CFS) =       8.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   7.10
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11703.00 =     855.33 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11703.00 TO NODE  11704.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1254.33  DOWNSTREAM(FEET) =   1143.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.91   CHANNEL SLOPE =  0.1076
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.060
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.73
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   3.62
  Tc(MIN.) =   13.83
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =    8.91
  EFFECTIVE AREA(ACRES) =     34.36     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.4         PEAK FLOW RATE(CFS) =      14.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =   4.87
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11704.00 =    1881.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11704.00 TO NODE  11705.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1143.91  DOWNSTREAM(FEET) =    804.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1952.20   CHANNEL SLOPE =  0.1737
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.836
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.19      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.35
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   5.12
  Tc(MIN.) =   18.95
  SUBAREA AREA(ACRES) =    50.19       SUBAREA RUNOFF(CFS) =   10.68
  EFFECTIVE AREA(ACRES) =     84.55     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       84.6         PEAK FLOW RATE(CFS) =      18.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =   6.23
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11705.00 =    3833.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    804.90  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1056.71   CHANNEL SLOPE =  0.0753
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.733
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.89      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   1.17   TRAVEL TIME(MIN.) =   3.83
  Tc(MIN.) =   22.77
  SUBAREA AREA(ACRES) =    15.89       SUBAREA RUNOFF(CFS) =    1.91
  EFFECTIVE AREA(ACRES) =    100.44     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.4         PEAK FLOW RATE(CFS) =      18.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =   4.54
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S16.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       16.56  101.74  0.60( 0.60) 1.00    3063.3   11620.00
      2       16.86  108.43  0.60( 0.60) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =     3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       16.56  101.74  0.60( 0.60) 1.00    3063.3   11620.00
      2       16.86  108.43  0.60( 0.60) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =      3203.8
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11721.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.22  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3507.54   CHANNEL SLOPE =  0.0413
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.319
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      213.50      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.56
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =  16.41
  Tc(MIN.) =  124.84
  SUBAREA AREA(ACRES) =   213.50       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   3417.34     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3417.3         PEAK FLOW RATE(CFS) =      16.86
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   3.56
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       16.56  118.20    0.326  0.60( 0.60) 1.00    3276.8   11620.00
      2       16.86  124.84    0.319  0.60( 0.60) 1.00    3417.3   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       18.00   22.77    0.733  0.60( 0.60) 1.00     100.4   11701.00
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
```



```
      1       25.18   22.77    0.733  0.60( 0.60) 1.00     731.8   11701.00
      2       16.56  118.20    0.326  0.60( 0.60) 1.00    3377.2   11620.00
      3       16.86  124.84    0.319  0.60( 0.60) 1.00    3517.8   11600.00
    TOTAL AREA(ACRES) =      3517.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       25.18  Tc(MIN.) =   22.775
  EFFECTIVE AREA(ACRES) =    731.82  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3517.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11721.00 TO NODE  11722.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    725.34  DOWNSTREAM(FEET) =    657.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1845.27   CHANNEL SLOPE =  0.0367
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.595
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      185.10      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.77
  AVERAGE FLOW DEPTH(FEET) =   1.49   TRAVEL TIME(MIN.) =   8.16
  Tc(MIN.) =   30.94
  SUBAREA AREA(ACRES) =   185.10       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    916.92     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3702.9         PEAK FLOW RATE(CFS) =      25.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.49   FLOW VELOCITY(FEET/SEC.) =   3.77
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11722.00 =   29846.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11722.00 TO NODE  11723.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.70  DOWNSTREAM(FEET) =    609.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1967.44   CHANNEL SLOPE =  0.0245
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.515
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      273.16      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.23
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =  10.16
  Tc(MIN.) =   41.10
  SUBAREA AREA(ACRES) =   273.16       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1190.08     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3976.0         PEAK FLOW RATE(CFS) =      25.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =   3.23
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11723.00 =   31813.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11723.00 TO NODE  11724.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    609.57  DOWNSTREAM(FEET) =    546.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2808.53   CHANNEL SLOPE =  0.0224
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.442
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      159.72      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.13
  AVERAGE FLOW DEPTH(FEET) =   1.64   TRAVEL TIME(MIN.) =  14.95
  Tc(MIN.) =   56.05
  SUBAREA AREA(ACRES) =   159.72       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1349.80     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     4135.8         PEAK FLOW RATE(CFS) =      25.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.64   FLOW VELOCITY(FEET/SEC.) =   3.13
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11724.00 =   34622.42 FEET.
```



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****************************************************************************
  FLOW PROCESS FROM NODE  11724.00 TO NODE  11725.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    546.77  DOWNSTREAM(FEET) =    483.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2921.33   CHANNEL SLOPE =  0.0216
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.404
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.67      0.60     0.917     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.15
  AVERAGE FLOW DEPTH(FEET) =   1.70   TRAVEL TIME(MIN.) =  15.45
  Tc(MIN.) =   71.50
  SUBAREA AREA(ACRES) =   134.67       SUBAREA RUNOFF(CFS) =    4.06
  EFFECTIVE AREA(ACRES) =   1484.47     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     4270.4         PEAK FLOW RATE(CFS) =      25.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.65   FLOW VELOCITY(FEET/SEC.) =   3.08
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11725.00 =   37543.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    483.75  DOWNSTREAM(FEET) =    436.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2685.66   CHANNEL SLOPE =  0.0177
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.372
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      121.44      0.60     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.87
  AVERAGE FLOW DEPTH(FEET) =   1.72   TRAVEL TIME(MIN.) =  15.59
```

```
  Tc(MIN.) =   87.09
  SUBAREA AREA(ACRES) =   121.44       SUBAREA RUNOFF(CFS) =    0.57
  EFFECTIVE AREA(ACRES) =   1605.91     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     4391.9         PEAK FLOW RATE(CFS) =      25.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =   2.86
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     4391.9  TC(MIN.) =     87.09
  EFFECTIVE AREA(ACRES) =   1605.91  AREA-AVERAGED Fm(INCH/HR)=  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.991
  PEAK FLOW RATE(CFS)   =      25.18

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       25.18   87.09    0.372  0.60( 0.59) 0.99    1605.9   11701.00
      2       16.56  189.59    0.269  0.60( 0.60) 0.99    4251.3   11620.00
      3       16.86  195.86    0.267  0.60( 0.60) 0.99    4391.9   11600.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S18.DAT
  TIME/DATE OF STUDY: 14:36 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.948
   2)   10.00;  1.299
   3)   15.00;  0.980
   4)   20.00;  0.794
   5)   25.00;  0.680
   6)   30.00;  0.602
   7)   40.00;  0.520
   8)   50.00;  0.463
   9)   60.00;  0.426
  10)   90.00;  0.364
  11)  120.00;  0.321
  12)  180.00;  0.271
  13)  360.00;  0.203
  14) 1440.00;  0.091
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11801.00 TO NODE  11802.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   970.31
  ELEVATION DATA: UPSTREAM(FEET) =    834.89  DOWNSTREAM(FEET) =    727.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.170
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.899
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        7.24      0.60     1.000     0   17.17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.95
  TOTAL AREA(ACRES) =      7.24   PEAK FLOW RATE(CFS) =      1.95

**************************************************************************
  FLOW PROCESS FROM NODE  11802.00 TO NODE  11803.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    727.50  DOWNSTREAM(FEET) =    674.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   968.10   CHANNEL SLOPE =  0.0551
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.719
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.08      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.63
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   6.14
  Tc(MIN.) =   23.31
  SUBAREA AREA(ACRES) =    22.08       SUBAREA RUNOFF(CFS) =    2.36
  EFFECTIVE AREA(ACRES) =     29.32     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3         PEAK FLOW RATE(CFS) =       3.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.63   FLOW VELOCITY(FEET/SEC.) =   2.63
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11803.00 =    1938.41 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11803.00 TO NODE  11804.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    674.12  DOWNSTREAM(FEET) =    554.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.27   CHANNEL SLOPE =  0.0642
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.565
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       35.55      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.76
 AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =  11.26
 Tc(MIN.) =   34.57
 SUBAREA AREA(ACRES) =    35.55       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =     64.87     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =       64.9         PEAK FLOW RATE(CFS) =       3.13
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   2.76
 LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11804.00 =    3802.68 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    554.40  DOWNSTREAM(FEET) =    423.93
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1767.25   CHANNEL SLOPE =  0.0738
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.493
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       36.70      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.90
 AVERAGE FLOW DEPTH(FEET) =   0.60   TRAVEL TIME(MIN.) =  10.15
 Tc(MIN.) =   44.72
 SUBAREA AREA(ACRES) =    36.70       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    101.57     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      101.6         PEAK FLOW RATE(CFS) =       3.13
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 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   2.90
 LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11821.00 =    5569.93 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S15.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      425.24   70.41  0.60( 0.60) 0.99    5310.6   11530.00
     2      515.04   92.40  0.60( 0.60) 1.00    7906.9   11000.00
     3      609.35  110.72  0.60( 0.60) 1.00   11455.6   11350.00
     4      631.37  117.24  0.60( 0.60) 1.00   12786.9   10850.00
     5      624.04  120.63  0.60( 0.60) 1.00   13360.4   11300.00
     6      597.13  124.86  0.60( 0.60) 1.00   13953.5   10800.00
     7      549.09  131.30  0.60( 0.60) 1.00   14770.2   11220.00
     8      483.80  141.26  0.60( 0.60) 1.00   15621.5   10910.00
     9      435.68  148.71  0.60( 0.60) 1.00   16068.8   10630.00
    10      317.33  184.82  0.60( 0.60) 1.00   19382.9   10600.00
    11      295.53  200.26  0.60( 0.60) 1.00   21324.6   11201.00
    12      294.22  203.23  0.60( 0.60) 1.00   21667.9   10500.00
    13      294.30  213.31  0.60( 0.60) 1.00   22606.8   10710.00
    14      288.94  221.25  0.60( 0.60) 1.00   23128.4   10410.00
    15      275.81  242.43  0.60( 0.60) 1.00   24342.6   10700.00
    16      275.07  259.73  0.60( 0.60) 1.00   25357.6   10200.00
    17      269.70  277.71  0.60( 0.60) 1.00   26100.9   10320.00
    18      267.62  282.66  0.60( 0.60) 1.00   26247.9   10300.00
    19      258.30  300.87  0.60( 0.60) 1.00   26518.3   10210.00
    20      217.45  413.40  0.60( 0.60) 1.00   27497.1   10100.00
  TOTAL AREA(ACRES) =    27497.1

****************************************************************************
 FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S17.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       25.18   87.09  0.60( 0.59) 0.99    1605.9   11701.00
     2       16.56  189.59  0.60( 0.60) 0.99    4251.3   11620.00
     3       16.86  195.86  0.60( 0.60) 0.99    4391.9   11600.00
  TOTAL AREA(ACRES) =     4391.9

****************************************************************************
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 FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       25.18   87.09  0.60( 0.59) 0.99    1605.9   11701.00
     2       16.56  189.59  0.60( 0.60) 0.99    4251.3   11620.00
     3       16.86  195.86  0.60( 0.60) 0.99    4391.9   11600.00
   TOTAL AREA(ACRES) =      4391.9

****************************************************************************
 FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       25.18   87.09    0.370  0.60( 0.59) 0.99    1605.9   11701.00
     2       16.56  189.59    0.267  0.60( 0.60) 0.99    4251.3   11620.00
     3       16.86  195.86    0.265  0.60( 0.60) 0.99    4391.9   11600.00
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      425.24   70.41    0.404  0.60( 0.60) 0.99    5310.6   11530.00
     2      515.04   92.40    0.361  0.60( 0.60) 1.00    7906.9   11000.00
     3      609.35  110.72    0.334  0.60( 0.60) 1.00   11455.6   11350.00
     4      631.37  117.24    0.325  0.60( 0.60) 1.00   12786.9   10850.00
     5      624.04  120.63    0.320  0.60( 0.60) 1.00   13360.4   11300.00
     6      597.13  124.86    0.317  0.60( 0.60) 1.00   13953.5   10800.00
     7      549.09  131.30    0.312  0.60( 0.60) 1.00   14770.2   11220.00
     8      483.80  141.26    0.303  0.60( 0.60) 1.00   15621.5   10910.00
     9      435.68  148.71    0.297  0.60( 0.60) 1.00   16068.8   10630.00
    10      317.33  184.82    0.269  0.60( 0.60) 1.00   19382.9   10600.00
    11      295.53  200.26    0.263  0.60( 0.60) 1.00   21324.6   11201.00
    12      294.22  203.23    0.262  0.60( 0.60) 1.00   21667.9   10500.00
    13      294.30  213.31    0.258  0.60( 0.60) 1.00   22606.8   10710.00
    14      288.94  221.25    0.255  0.60( 0.60) 1.00   23128.4   10410.00
    15      275.81  242.43    0.247  0.60( 0.60) 1.00   24342.6   10700.00
    16      275.07  259.73    0.241  0.60( 0.60) 1.00   25357.6   10200.00
    17      269.70  277.71    0.234  0.60( 0.60) 1.00   26100.9   10320.00
    18      267.62  282.66    0.232  0.60( 0.60) 1.00   26247.9   10300.00
    19      258.30  300.87    0.225  0.60( 0.60) 1.00   26518.3   10210.00
    20      217.45  413.40    0.197  0.60( 0.60) 1.00   27497.1   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      447.49   70.41    0.404  0.60( 0.60) 0.99    6608.9   11530.00
     2      518.54   87.09    0.370  0.60( 0.60) 0.99    8886.0   11701.00
     3      539.78   92.40    0.361  0.60( 0.60) 0.99    9649.9   11000.00
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     4      632.55  110.72    0.334  0.60( 0.60) 1.00   13671.4   11350.00
     5      654.02  117.24    0.325  0.60( 0.60) 1.00   15171.0   10850.00
     6      646.40  120.63    0.320  0.60( 0.60) 1.00   15832.0   11300.00
     7      619.14  124.86    0.317  0.60( 0.60) 1.00   16534.1   10800.00
     8      570.55  131.30    0.312  0.60( 0.60) 1.00   17517.0   11220.00
     9      504.43  141.26    0.303  0.60( 0.60) 1.00   18625.4   10910.00
    10      455.67  148.71    0.297  0.60( 0.60) 1.00   19265.2   10630.00
    11      334.29  184.82    0.269  0.60( 0.60) 1.00   23511.0   10600.00
    12      327.15  189.59    0.267  0.60( 0.60) 1.00   24234.8   11620.00
    13      318.60  195.86    0.265  0.60( 0.60) 1.00   25163.6   11600.00
    14      312.29  200.26    0.263  0.60( 0.60) 1.00   25716.4   11201.00
    15      310.90  203.23    0.262  0.60( 0.60) 1.00   26059.8   10500.00
    16      310.74  213.31    0.258  0.60( 0.60) 1.00   26998.7   10710.00
    17      305.19  221.25    0.255  0.60( 0.60) 1.00   27520.3   10410.00
    18      291.55  242.43    0.247  0.60( 0.60) 1.00   28734.5   10700.00
    19      290.39  259.73    0.241  0.60( 0.60) 1.00   29749.5   10200.00
    20      284.59  277.71    0.234  0.60( 0.60) 1.00   30492.8   10320.00
    21      282.39  282.66    0.232  0.60( 0.60) 1.00   30639.8   10300.00
    22      272.63  300.87    0.225  0.60( 0.60) 1.00   30910.2   10210.00
    23      230.01  413.40    0.197  0.60( 0.60) 1.00   31889.0   10100.00
  TOTAL AREA(ACRES) =     31889.0

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      654.02  Tc(MIN.) =  117.240
 EFFECTIVE AREA(ACRES) =  15170.95  AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =    31889.0
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11726.00 TO NODE  11821.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    436.21  DOWNSTREAM(FEET) =    423.93
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1621.39   CHANNEL SLOPE =  0.0076
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.320
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       59.69      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     654.02
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.38
 AVERAGE FLOW DEPTH(FEET) =   5.85   TRAVEL TIME(MIN.) =   4.24
 Tc(MIN.) =  121.48
 SUBAREA AREA(ACRES) =    59.69       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =  15230.64     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =    31948.7         PEAK FLOW RATE(CFS) =     654.02
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NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.85 FLOW VELOCITY(FEET/SEC.) = 6.38
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	447.49	75.07	0.395	0.60(0.60)	0.99	6668.6	11530.00
2	518.54	91.58	0.362	0.60(0.60)	0.99	8945.7	11701.00
3	539.78	96.83	0.354	0.60(0.60)	0.99	9709.5	11000.00
4	632.55	114.99	0.328	0.60(0.60)	1.00	13731.1	11350.00
5	654.02	121.48	0.320	0.60(0.60)	1.00	15230.6	10850.00
6	646.40	124.88	0.317	0.60(0.60)	1.00	15891.7	11300.00
7	619.14	129.15	0.313	0.60(0.60)	1.00	16593.8	10800.00
8	570.55	135.68	0.308	0.60(0.60)	1.00	17576.7	11220.00
9	504.43	145.78	0.300	0.60(0.60)	1.00	18685.1	10910.00
10	455.67	153.36	0.293	0.60(0.60)	1.00	19324.9	10630.00
11	334.29	189.83	0.267	0.60(0.60)	1.00	23570.7	10600.00
12	327.15	194.63	0.265	0.60(0.60)	1.00	24294.5	11620.00
13	318.60	200.94	0.263	0.60(0.60)	1.00	25223.3	11600.00
14	312.29	205.35	0.261	0.60(0.60)	1.00	25776.1	11201.00
15	310.90	208.33	0.260	0.60(0.60)	1.00	26119.4	10500.00
16	310.74	218.41	0.256	0.60(0.60)	1.00	27058.4	10710.00
17	305.19	226.38	0.253	0.60(0.60)	1.00	27580.0	10410.00
18	291.55	247.61	0.245	0.60(0.60)	1.00	28794.2	10700.00
19	290.39	264.93	0.239	0.60(0.60)	1.00	29809.2	10200.00
20	284.59	282.92	0.232	0.60(0.60)	1.00	30552.4	10320.00
21	282.39	287.89	0.230	0.60(0.60)	1.00	30699.5	10300.00
22	272.63	306.14	0.223	0.60(0.60)	1.00	30969.9	10210.00
23	230.01	418.89	0.197	0.60(0.60)	1.00	31948.7	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 654.02 Tc(MIN.) = 121.48
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 15230.64

****
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	447.49	75.07	0.395	0.60(0.60)	0.99	6668.6	11530.00
2	518.54	91.58	0.362	0.60(0.60)	0.99	8945.7	11701.00
3	539.78	96.83	0.354	0.60(0.60)	0.99	9709.5	11000.00
4	632.55	114.99	0.328	0.60(0.60)	1.00	13731.1	11350.00
5	654.02	121.48	0.320	0.60(0.60)	1.00	15230.6	10850.00
6	646.40	124.88	0.317	0.60(0.60)	1.00	15891.7	11300.00
7	619.14	129.15	0.313	0.60(0.60)	1.00	16593.8	10800.00
8	570.55	135.68	0.308	0.60(0.60)	1.00	17576.7	11220.00
9	504.43	145.78	0.300	0.60(0.60)	1.00	18685.1	10910.00
10	455.67	153.36	0.293	0.60(0.60)	1.00	19324.9	10630.00
11	334.29	189.83	0.267	0.60(0.60)	1.00	23570.7	10600.00
12	327.15	194.63	0.265	0.60(0.60)	1.00	24294.5	11620.00

13	318.60	200.94	0.263	0.60(0.60)	1.00	25223.3	11600.00
14	312.29	205.35	0.261	0.60(0.60)	1.00	25776.1	11201.00
15	310.90	208.33	0.260	0.60(0.60)	1.00	26119.4	10500.00
16	310.74	218.41	0.256	0.60(0.60)	1.00	27058.4	10710.00
17	305.19	226.38	0.253	0.60(0.60)	1.00	27580.0	10410.00
18	291.55	247.61	0.245	0.60(0.60)	1.00	28794.2	10700.00
19	290.39	264.93	0.239	0.60(0.60)	1.00	29809.2	10200.00
20	284.59	282.92	0.232	0.60(0.60)	1.00	30552.4	10320.00
21	282.39	287.89	0.230	0.60(0.60)	1.00	30699.5	10300.00
22	272.63	306.14	0.223	0.60(0.60)	1.00	30969.9	10210.00
23	230.01	418.89	0.197	0.60(0.60)	1.00	31948.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.13	44.72	0.493	0.60(0.60)	1.00	101.6	11801.00

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	336.04	44.72	0.493	0.60(0.60)	0.99	4074.3	11801.00
2	450.00	75.07	0.395	0.60(0.60)	0.99	6770.2	11530.00
3	520.84	91.58	0.362	0.60(0.60)	0.99	9047.2	11701.00
4	542.03	96.83	0.354	0.60(0.60)	0.99	9811.1	11000.00
5	634.63	114.99	0.328	0.60(0.60)	1.00	13832.6	11350.00
6	656.05	121.48	0.320	0.60(0.60)	1.00	15332.2	10850.00
7	648.41	124.88	0.317	0.60(0.60)	1.00	15993.3	11300.00
8	621.13	129.15	0.313	0.60(0.60)	1.00	16695.4	10800.00
9	572.50	135.68	0.308	0.60(0.60)	1.00	17678.3	11220.00
10	506.33	145.78	0.300	0.60(0.60)	1.00	18786.6	10910.00
11	457.54	153.36	0.293	0.60(0.60)	1.00	19426.4	10630.00
12	335.99	189.83	0.267	0.60(0.60)	1.00	23672.3	10600.00
13	328.83	194.63	0.265	0.60(0.60)	1.00	24396.1	11620.00
14	320.27	200.94	0.263	0.60(0.60)	1.00	25324.9	11600.00
15	313.95	205.35	0.261	0.60(0.60)	1.00	25877.7	11201.00
16	312.56	208.33	0.260	0.60(0.60)	1.00	26221.0	10500.00
17	312.37	218.41	0.256	0.60(0.60)	1.00	27160.0	10710.00
18	306.80	226.38	0.253	0.60(0.60)	1.00	27681.5	10410.00
19	293.11	247.61	0.245	0.60(0.60)	1.00	28895.8	10700.00
20	291.91	264.93	0.239	0.60(0.60)	1.00	29910.8	10200.00
21	286.06	282.92	0.232	0.60(0.60)	1.00	30654.0	10320.00
22	283.85	287.89	0.230	0.60(0.60)	1.00	30801.1	10300.00
23	274.05	306.14	0.223	0.60(0.60)	1.00	31071.5	10210.00
24	231.26	418.89	0.197	0.60(0.60)	1.00	32050.3	10100.00

TOTAL AREA(ACRES) = 32050.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 656.05 Tc(MIN.) = 121.478
EFFECTIVE AREA(ACRES) = 15332.21 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32050.3
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 51

```
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    423.93  DOWNSTREAM(FEET) =    402.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1912.90   CHANNEL SLOPE =  0.0113
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.316
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      201.91      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     656.05
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
 AVERAGE FLOW DEPTH(FEET) =   5.43   TRAVEL TIME(MIN.) =   4.30
 Tc(MIN.) =  125.78
 SUBAREA AREA(ACRES) =   201.91       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =  15534.12     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =    32252.2         PEAK FLOW RATE(CFS) =     656.05
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.43   FLOW VELOCITY(FEET/SEC.) =   7.42
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11822.00 =   92657.60 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      336.04   49.81    0.464  0.60( 0.60) 0.99    4276.2   11801.00
     2      450.00   79.80    0.385  0.60( 0.60) 0.99    6972.1   11530.00
     3      520.84   96.13    0.355  0.60( 0.60) 0.99    9249.1   11701.00
     4      542.03  101.34    0.348  0.60( 0.60) 0.99   10013.0   11000.00
     5      634.63  119.33    0.322  0.60( 0.60) 1.00   14034.6   11350.00
     6      656.05  125.78    0.316  0.60( 0.60) 1.00   15534.1   10850.00
     7      648.41  129.19    0.313  0.60( 0.60) 1.00   16195.2   11300.00
     8      621.13  133.51    0.310  0.60( 0.60) 1.00   16897.3   10800.00
     9      572.50  140.13    0.304  0.60( 0.60) 1.00   17880.2   11220.00
    10      506.33  150.37    0.296  0.60( 0.60) 1.00   18988.5   10910.00
    11      457.54  158.06    0.289  0.60( 0.60) 1.00   19628.3   10630.00
    12      335.99  194.91    0.265  0.60( 0.60) 1.00   23874.2   10600.00
    13      328.83  199.74    0.264  0.60( 0.60) 1.00   24598.0   11620.00
    14      320.27  206.09    0.261  0.60( 0.60) 1.00   25526.8   11600.00
    15      313.95  210.53    0.259  0.60( 0.60) 1.00   26079.6   11201.00
    16      312.56  213.51    0.258  0.60( 0.60) 1.00   26422.9   10500.00
    17      312.37  223.60    0.255  0.60( 0.60) 1.00   27361.9   10710.00
    18      306.80  231.58    0.252  0.60( 0.60) 1.00   27883.4   10410.00
    19      293.11  252.87    0.243  0.60( 0.60) 1.00   29097.7   10700.00
    20      291.91  270.20    0.237  0.60( 0.60) 1.00   30112.7   10200.00
    21      286.06  288.22    0.230  0.60( 0.60) 1.00   30855.9   10320.00
    22      283.85  293.20    0.228  0.60( 0.60) 1.00   31003.0   10300.00
    23      274.05  311.49    0.221  0.60( 0.60) 1.00   31273.4   10210.00
```



```
    24      231.26  424.48    0.196  0.60( 0.60) 1.00   32252.2   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     656.05  Tc(MIN.) =  125.78
 AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =   15534.12

********************************************************************************
 FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =  51
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    402.38  DOWNSTREAM(FEET) =    380.74
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2380.10   CHANNEL SLOPE =  0.0091
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.311
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      116.13      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     656.05
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.84
 AVERAGE FLOW DEPTH(FEET) =   5.66   TRAVEL TIME(MIN.) =   5.80
 Tc(MIN.) =  131.58
 SUBAREA AREA(ACRES) =   116.13       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =  15650.25     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =    32368.3         PEAK FLOW RATE(CFS) =     656.05
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.66   FLOW VELOCITY(FEET/SEC.) =   6.84
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      336.04   56.67    0.438  0.60( 0.60) 0.99    4392.4   11801.00
     2      450.00   86.17    0.372  0.60( 0.60) 0.99    7088.2   11530.00
     3      520.84  102.27    0.346  0.60( 0.60) 0.99    9365.3   11701.00
     4      542.03  107.42    0.339  0.60( 0.60) 0.99   10129.2   11000.00
     5      634.63  125.18    0.317  0.60( 0.60) 1.00   14150.7   11350.00
     6      656.05  131.58    0.311  0.60( 0.60) 1.00   15650.3   10850.00
     7      648.41  135.00    0.308  0.60( 0.60) 1.00   16311.3   11300.00
     8      621.13  139.40    0.305  0.60( 0.60) 1.00   17013.4   10800.00
     9      572.50  146.13    0.299  0.60( 0.60) 1.00   17996.3   11220.00
    10      506.33  156.56    0.291  0.60( 0.60) 1.00   19104.7   10910.00
    11      457.54  164.40    0.284  0.60( 0.60) 1.00   19744.5   10630.00
    12      335.99  201.76    0.263  0.60( 0.60) 1.00   23990.3   10600.00
    13      328.83  206.64    0.261  0.60( 0.60) 1.00   24714.1   11620.00
    14      320.27  213.03    0.259  0.60( 0.60) 1.00   25642.9   11600.00
```

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    15      313.95  217.51    0.257  0.60( 0.60) 1.00   26195.7   11201.00
    16      312.56  220.50    0.256  0.60( 0.60) 1.00   26539.1   10500.00
    17      312.37  230.58    0.252  0.60( 0.60) 1.00   27478.0   10710.00
    18      306.80  238.59    0.249  0.60( 0.60) 1.00   27999.6   10410.00
    19      293.11  259.96    0.241  0.60( 0.60) 1.00   29213.8   10700.00
    20      291.91  277.31    0.234  0.60( 0.60) 1.00   30228.8   10200.00
    21      286.06  295.35    0.227  0.60( 0.60) 1.00   30972.1   10320.00
    22      283.85  300.35    0.226  0.60( 0.60) 1.00   31119.1   10300.00
    23      274.05  318.71    0.219  0.60( 0.60) 1.00   31389.5   10210.00
    24      231.26  432.01    0.196  0.60( 0.60) 1.00   32368.3   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     656.05  Tc(MIN.) =  131.58
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =   15650.25

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  131.58
  RAINFALL INTENSITY(INCH/HR) =   0.31
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   15650.25
  TOTAL STREAM AREA(ACRES) =   32368.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     656.05

****************************************************************************
  FLOW PROCESS FROM NODE  11831.00 TO NODE  11832.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.20
  ELEVATION DATA: UPSTREAM(FEET) =   1353.30  DOWNSTREAM(FEET) =   1280.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.179
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.535
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.76      0.60     1.000     0    8.18
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.64
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      0.64

****************************************************************************
  FLOW PROCESS FROM NODE  11832.00 TO NODE  11833.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1280.02  DOWNSTREAM(FEET) =   1070.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   686.67   CHANNEL SLOPE =  0.3057
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.258
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        5.95      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.66
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   10.64
  SUBAREA AREA(ACRES) =     5.95       SUBAREA RUNOFF(CFS) =    3.53
  EFFECTIVE AREA(ACRES) =      6.71     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =       3.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   5.29
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11833.00 =     934.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11833.00 TO NODE  11834.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1070.08  DOWNSTREAM(FEET) =    913.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.36   CHANNEL SLOPE =  0.1601
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.051
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       23.21      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.00
  AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =   3.25
  Tc(MIN.) =   13.89
  SUBAREA AREA(ACRES) =    23.21       SUBAREA RUNOFF(CFS) =    9.42
  EFFECTIVE AREA(ACRES) =     29.92     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.9         PEAK FLOW RATE(CFS) =      12.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   5.48
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11834.00 =    1912.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11834.00 TO NODE  11835.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    913.56  DOWNSTREAM(FEET) =    727.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.63   CHANNEL SLOPE =  0.0989
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.794
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.73      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.12
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   6.11
  Tc(MIN.) =   20.00
  SUBAREA AREA(ACRES) =    73.73       SUBAREA RUNOFF(CFS) =   12.89
  EFFECTIVE AREA(ACRES) =    103.65     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      103.7         PEAK FLOW RATE(CFS) =      18.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   5.03
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11835.00 =    3787.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11835.00 TO NODE  11836.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    727.99  DOWNSTREAM(FEET) =    611.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.64   CHANNEL SLOPE =  0.0615
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.644
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       93.31      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.34
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   7.28
  Tc(MIN.) =   27.28
  SUBAREA AREA(ACRES) =    93.31       SUBAREA RUNOFF(CFS) =    3.75
  EFFECTIVE AREA(ACRES) =    196.96     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      197.0         PEAK FLOW RATE(CFS) =      18.13
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   4.23
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11836.00 =    5684.50 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11836.00 TO NODE  11837.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    611.39  DOWNSTREAM(FEET) =    508.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2178.15   CHANNEL SLOPE =  0.0472
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.547
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.92      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.83
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =   9.48
  Tc(MIN.) =   36.76
  SUBAREA AREA(ACRES) =    98.92       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    295.88     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      295.9         PEAK FLOW RATE(CFS) =      18.13
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   3.83
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11837.00 =    7862.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11837.00 TO NODE  11838.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    508.59  DOWNSTREAM(FEET) =    448.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1942.91   CHANNEL SLOPE =  0.0309
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.482
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.71      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.25
  AVERAGE FLOW DEPTH(FEET) =   1.36   TRAVEL TIME(MIN.) =   9.95
  Tc(MIN.) =   46.71
```

```
  SUBAREA AREA(ACRES) =    79.71       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    375.59     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      375.6         PEAK FLOW RATE(CFS) =      18.13
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =   3.25
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.00 =    9805.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.00 TO NODE  11838.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    448.50  DOWNSTREAM(FEET) =    420.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =   917.65   CHANNEL SLOPE =  0.0302
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.458
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.57      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.23
  AVERAGE FLOW DEPTH(FEET) =   1.37   TRAVEL TIME(MIN.) =   4.74
  Tc(MIN.) =   51.45
  SUBAREA AREA(ACRES) =    34.57       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    410.16     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      410.2         PEAK FLOW RATE(CFS) =      18.13
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.37   FLOW VELOCITY(FEET/SEC.) =   3.23
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.50 =   10723.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    420.79  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1615.83   CHANNEL SLOPE =  0.0248
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.425
```



```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.54      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.99
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   9.01
  Tc(MIN.) =   60.46
  SUBAREA AREA(ACRES) =    21.54       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    431.70     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      431.7         PEAK FLOW RATE(CFS) =      18.13
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =   2.99
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11841.00 =   12339.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   60.46
  RAINFALL INTENSITY(INCH/HR) =   0.43
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     431.70
  TOTAL STREAM AREA(ACRES) =     431.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      18.13

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      336.04   56.67    0.438  0.60( 0.60) 0.99    4392.4   11801.00
      1      450.00   86.17    0.372  0.60( 0.60) 0.99    7088.2   11530.00
      1      520.84  102.27    0.346  0.60( 0.60) 0.99    9365.3   11701.00
      1      542.03  107.42    0.339  0.60( 0.60) 0.99   10129.2   11000.00
      1      634.63  125.18    0.317  0.60( 0.60) 1.00   14150.7   11350.00
      1      656.05  131.58    0.311  0.60( 0.60) 1.00   15650.3   10850.00
      1      648.41  135.00    0.308  0.60( 0.60) 1.00   16311.3   11300.00
      1      621.13  139.40    0.305  0.60( 0.60) 1.00   17013.4   10800.00
      1      572.50  146.13    0.299  0.60( 0.60) 1.00   17996.3   11220.00
      1      506.33  156.56    0.291  0.60( 0.60) 1.00   19104.7   10910.00
      1      457.54  164.40    0.284  0.60( 0.60) 1.00   19744.5   10630.00
      1      335.99  201.76    0.263  0.60( 0.60) 1.00   23990.3   10600.00
      1      328.83  206.64    0.261  0.60( 0.60) 1.00   24714.1   11620.00
      1      320.27  213.03    0.259  0.60( 0.60) 1.00   25642.9   11600.00
```

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     1      313.95  217.51    0.257  0.60( 0.60) 1.00   26195.7   11201.00
     1      312.56  220.50    0.256  0.60( 0.60) 1.00   26539.1   10500.00
     1      312.37  230.58    0.252  0.60( 0.60) 1.00   27478.0   10710.00
     1      306.80  238.59    0.249  0.60( 0.60) 1.00   27999.6   10410.00
     1      293.11  259.96    0.241  0.60( 0.60) 1.00   29213.8   10700.00
     1      291.91  277.31    0.234  0.60( 0.60) 1.00   30228.8   10200.00
     1      286.06  295.35    0.227  0.60( 0.60) 1.00   30972.1   10320.00
     1      283.85  300.35    0.226  0.60( 0.60) 1.00   31119.1   10300.00
     1      274.05  318.71    0.219  0.60( 0.60) 1.00   31389.5   10210.00
     1      231.26  432.01    0.196  0.60( 0.60) 1.00   32368.3   10100.00
     2       18.13   60.46    0.425  0.60( 0.60) 1.00     431.7   11831.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      353.56   56.67    0.438  0.60( 0.60) 0.99    4797.0   11801.00
     2      368.84   60.46    0.425  0.60( 0.60) 0.99    5171.0   11831.00
     3      465.86   86.17    0.372  0.60( 0.60) 0.99    7519.9   11530.00
     4      535.61  102.27    0.346  0.60( 0.60) 0.99    9797.0   11701.00
     5      556.49  107.42    0.339  0.60( 0.60) 0.99   10560.9   11000.00
     6      648.13  125.18    0.317  0.60( 0.60) 1.00   14582.4   11350.00
     7      669.33  131.58    0.311  0.60( 0.60) 1.00   16082.0   10850.00
     8      661.57  135.00    0.308  0.60( 0.60) 1.00   16743.0   11300.00
     9      634.13  139.40    0.305  0.60( 0.60) 1.00   17445.1   10800.00
    10      585.26  146.13    0.299  0.60( 0.60) 1.00   18428.0   11220.00
    11      518.72  156.56    0.291  0.60( 0.60) 1.00   19536.4   10910.00
    12      469.65  164.40    0.284  0.60( 0.60) 1.00   20176.2   10630.00
    13      347.20  201.76    0.263  0.60( 0.60) 1.00   24422.0   10600.00
    14      339.96  206.64    0.261  0.60( 0.60) 1.00   25145.8   11620.00
    15      331.29  213.03    0.259  0.60( 0.60) 1.00   26074.6   11600.00
    16      324.90  217.51    0.257  0.60( 0.60) 1.00   26627.4   11201.00
    17      323.46  220.50    0.256  0.60( 0.60) 1.00   26970.8   10500.00
    18      323.11  230.58    0.252  0.60( 0.60) 1.00   27909.7   10710.00
    19      317.41  238.59    0.249  0.60( 0.60) 1.00   28431.3   10410.00
    20      303.38  259.96    0.241  0.60( 0.60) 1.00   29645.5   10700.00
    21      301.90  277.31    0.234  0.60( 0.60) 1.00   30660.5   10200.00
    22      295.76  295.35    0.227  0.60( 0.60) 1.00   31403.8   10320.00
    23      293.47  300.35    0.226  0.60( 0.60) 1.00   31550.8   10300.00
    24      283.38  318.71    0.219  0.60( 0.60) 1.00   31821.2   10210.00
    25      239.60  432.01    0.196  0.60( 0.60) 1.00   32800.0   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     669.33    Tc(MIN.) =   131.58
  EFFECTIVE AREA(ACRES) =   16081.95   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    32800.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  12527.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.74  DOWNSTREAM(FEET) =    347.47
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  CHANNEL LENGTH THRU SUBAREA(FEET) =  2830.43   CHANNEL SLOPE =  0.0118
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.306
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.59      0.60     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     669.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.57
  AVERAGE FLOW DEPTH(FEET) =   5.43   TRAVEL TIME(MIN.) =   6.23
  Tc(MIN.) =  137.81
  SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =    0.10
  EFFECTIVE AREA(ACRES) =  16198.54     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    32916.6         PEAK FLOW RATE(CFS) =     669.33
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.43   FLOW VELOCITY(FEET/SEC.) =   7.57
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12527.00 =   97868.13 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      353.56   63.98    0.418  0.60( 0.60) 0.99    4913.5   11801.00
     2      368.84   67.70    0.410  0.60( 0.60) 0.99    5287.6   11831.00
     3      465.86   93.00    0.360  0.60( 0.60) 0.99    7636.5   11530.00
     4      535.61  108.86    0.337  0.60( 0.60) 0.99    9913.6   11701.00
     5      556.49  113.96    0.330  0.60( 0.60) 0.99   10677.4   11000.00
     6      648.13  131.47    0.311  0.60( 0.60) 1.00   14699.0   11350.00
     7      669.33  137.81    0.306  0.60( 0.60) 1.00   16198.5   10850.00
     8      661.57  141.26    0.303  0.60( 0.60) 1.00   16859.6   11300.00
     9      634.13  145.71    0.300  0.60( 0.60) 1.00   17561.7   10800.00
    10      585.26  152.57    0.294  0.60( 0.60) 1.00   18544.6   11220.00
    11      518.72  163.20    0.285  0.60( 0.60) 1.00   19653.0   10910.00
    12      469.65  171.22    0.278  0.60( 0.60) 1.00   20292.8   10630.00
    13      347.20  209.11    0.260  0.60( 0.60) 1.00   24538.6   10600.00
    14      339.96  214.03    0.258  0.60( 0.60) 1.00   25262.4   11620.00
    15      331.29  220.46    0.256  0.60( 0.60) 1.00   26191.2   11600.00
    16      324.90  224.97    0.254  0.60( 0.60) 1.00   26744.0   11201.00
    17      323.46  227.97    0.253  0.60( 0.60) 1.00   27087.3   10500.00
    18      323.11  238.06    0.249  0.60( 0.60) 1.00   28026.3   10710.00
    19      317.41  246.11    0.246  0.60( 0.60) 1.00   28547.9   10410.00
    20      303.38  267.54    0.238  0.60( 0.60) 1.00   29762.1   10700.00
    21      301.90  284.90    0.231  0.60( 0.60) 1.00   30777.1   10200.00
    22      295.76  302.98    0.225  0.60( 0.60) 1.00   31520.3   10320.00
    23      293.47  308.01    0.223  0.60( 0.60) 1.00   31667.4   10300.00
    24      283.38  326.44    0.216  0.60( 0.60) 1.00   31937.8   10210.00
    25      239.60  440.07    0.195  0.60( 0.60) 1.00   32916.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     669.33  Tc(MIN.) =  137.81
```

AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 16198.54

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 137.81
EFFECTIVE AREA(ACRES) = 16198.54 AREA-AVERAGED Fm(INCH/HR)= 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.996
PEAK FLOW RATE(CFS) = 669.33

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	353.56	63.98	0.418	0.60(0.60)	0.99	4913.5	11801.00
2	368.84	67.70	0.410	0.60(0.60)	0.99	5287.6	11831.00
3	465.86	93.00	0.360	0.60(0.60)	0.99	7636.5	11530.00
4	535.61	108.86	0.337	0.60(0.60)	0.99	9913.6	11701.00
5	556.49	113.96	0.330	0.60(0.60)	0.99	10677.4	11000.00
6	648.13	131.47	0.311	0.60(0.60)	1.00	14699.0	11350.00
7	669.33	137.81	0.306	0.60(0.60)	1.00	16198.5	10850.00
8	661.57	141.26	0.303	0.60(0.60)	1.00	16859.6	11300.00
9	634.13	145.71	0.300	0.60(0.60)	1.00	17561.7	10800.00
10	585.26	152.57	0.294	0.60(0.60)	1.00	18544.6	11220.00
11	518.72	163.20	0.285	0.60(0.60)	1.00	19653.0	10910.00
12	469.65	171.22	0.278	0.60(0.60)	1.00	20292.8	10630.00
13	347.20	209.11	0.260	0.60(0.60)	1.00	24538.6	10600.00
14	339.96	214.03	0.258	0.60(0.60)	1.00	25262.4	11620.00
15	331.29	220.46	0.256	0.60(0.60)	1.00	26191.2	11600.00
16	324.90	224.97	0.254	0.60(0.60)	1.00	26744.0	11201.00
17	323.46	227.97	0.253	0.60(0.60)	1.00	27087.3	10500.00
18	323.11	238.06	0.249	0.60(0.60)	1.00	28026.3	10710.00
19	317.41	246.11	0.246	0.60(0.60)	1.00	28547.9	10410.00
20	303.38	267.54	0.238	0.60(0.60)	1.00	29762.1	10700.00
21	301.90	284.90	0.231	0.60(0.60)	1.00	30777.1	10200.00
22	295.76	302.98	0.225	0.60(0.60)	1.00	31520.3	10320.00
23	293.47	308.01	0.223	0.60(0.60)	1.00	31667.4	10300.00
24	283.38	326.44	0.216	0.60(0.60)	1.00	31937.8	10210.00
25	239.60	440.07	0.195	0.60(0.60)	1.00	32916.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                        Analysis prepared by:

                      Michael Baker International
                    5 Hutton Centre Drive, Suite 500
                            Santa Ana, CA
                                92707

 ************************ DESCRIPTION OF STUDY *************************
*                                                                      *
*                                                                      *
*                                                                      *
 ************************************************************************

  FILE NAME: S19.DAT
  TIME/DATE OF STUDY: 07:44 07/16/2018
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.878
   2)   10.00;  1.253
   3)   15.00;  0.953
   4)   20.00;  0.778
   5)   25.00;  0.670
   6)   30.00;  0.594
   7)   40.00;  0.512
   8)   50.00;  0.455
   9)   60.00;  0.399
  10)   90.00;  0.345
  11)  120.00;  0.286
  12)  180.00;  0.229
  13)  360.00;  0.175
  14) 1200.00;  0.084
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
```



```
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

************************************************************************
  FLOW PROCESS FROM NODE  11900.00 TO NODE  11901.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.79
  ELEVATION DATA: UPSTREAM(FEET) =   2369.48  DOWNSTREAM(FEET) =   2332.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.203
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.603
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"          -        1.62      0.60     0.999     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  SUBAREA RUNOFF(CFS) =      1.46
  TOTAL AREA(ACRES) =      1.62   PEAK FLOW RATE(CFS) =      1.46

************************************************************************
  FLOW PROCESS FROM NODE  11901.00 TO NODE  11902.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2332.92  DOWNSTREAM(FEET) =   2297.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   664.26   CHANNEL SLOPE =  0.0530
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.177
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.35      0.60     0.906     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.72
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   4.07
  Tc(MIN.) =   11.27
  SUBAREA AREA(ACRES) =     8.35       SUBAREA RUNOFF(CFS) =    4.76
  EFFECTIVE AREA(ACRES) =      9.97     AREA-AVERAGED Fm(INCH/HR) =   0.55
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =       10.0         PEAK FLOW RATE(CFS) =       5.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.79   FLOW VELOCITY(FEET/SEC.) =   2.99
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.00 =     960.05 FEET.

************************************************************************
```

```
  FLOW PROCESS FROM NODE  11902.00 TO NODE  11902.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2297.70  DOWNSTREAM(FEET) =   2263.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.77   CHANNEL SLOPE =  0.0369
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.909
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.48      0.60     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.11
  AVERAGE FLOW DEPTH(FEET) =   1.11   TRAVEL TIME(MIN.) =   4.98
  Tc(MIN.) =   16.25
  SUBAREA AREA(ACRES) =    34.48       SUBAREA RUNOFF(CFS) =   11.39
  EFFECTIVE AREA(ACRES) =     44.45     AREA-AVERAGED Fm(INCH/HR) =   0.54
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.91
  TOTAL AREA(ACRES) =       44.5         PEAK FLOW RATE(CFS) =      14.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   3.29
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.50 =    1888.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11902.50 TO NODE  11903.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.40  DOWNSTREAM(FEET) =   2252.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   895.50   CHANNEL SLOPE =  0.0126
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.716
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.65      0.60     0.958     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.958
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.26
  AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   6.61
  Tc(MIN.) =   22.86
  SUBAREA AREA(ACRES) =    23.65       SUBAREA RUNOFF(CFS) =    3.01
  EFFECTIVE AREA(ACRES) =     68.10     AREA-AVERAGED Fm(INCH/HR) =   0.56
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       68.1         PEAK FLOW RATE(CFS) =      14.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   2.21
```



```
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11903.00 =    2784.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11903.00 TO NODE  11904.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2252.14  DOWNSTREAM(FEET) =   2186.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.35   CHANNEL SLOPE =  0.0343
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.571
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.53      0.60     0.961     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.961
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.24
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   9.90
  Tc(MIN.) =   32.77
  SUBAREA AREA(ACRES) =    68.53       SUBAREA RUNOFF(CFS) =    1.37
  EFFECTIVE AREA(ACRES) =    136.63     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.94
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      136.6         PEAK FLOW RATE(CFS) =      14.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   3.21
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11904.00 =    4708.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11904.00 TO NODE  11905.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2186.04  DOWNSTREAM(FEET) =   1957.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.87   CHANNEL SLOPE =  0.1187
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.520
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       63.15      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.13
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   6.26
  Tc(MIN.) =   39.03
  SUBAREA AREA(ACRES) =    63.15       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    199.78     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.96
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      199.8         PEAK FLOW RATE(CFS) =      14.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   5.13
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11905.00 =    6635.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11905.00 TO NODE  11906.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1957.34  DOWNSTREAM(FEET) =   1244.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2498.96   CHANNEL SLOPE =  0.2854
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.484
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.87      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.08
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   5.88
  Tc(MIN.) =   44.91
  SUBAREA AREA(ACRES) =    84.87       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    284.65     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      284.6         PEAK FLOW RATE(CFS) =      14.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   7.08
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11906.00 =    9134.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1244.16  DOWNSTREAM(FEET) =    873.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3370.75   CHANNEL SLOPE =  0.1098
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```



```
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.420
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.43      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.97
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =  11.30
  Tc(MIN.) =   56.21
  SUBAREA AREA(ACRES) =   199.43       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    484.08     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.98
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      484.1         PEAK FLOW RATE(CFS) =      14.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =   4.97
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11920.00 =   12505.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   56.21
  RAINFALL INTENSITY(INCH/HR) =   0.42
  AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.98
  EFFECTIVE STREAM AREA(ACRES) =     484.08
  TOTAL STREAM AREA(ACRES) =     484.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      14.59

****************************************************************************
  FLOW PROCESS FROM NODE  11910.00 TO NODE  11911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   517.62
  ELEVATION DATA: UPSTREAM(FEET) =   2531.88  DOWNSTREAM(FEET) =   2441.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.185
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.122
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
```

```
  "CHAPARRAL,BROADLEAF"      -        3.46      0.60     1.000     0   12.19
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.63
  TOTAL AREA(ACRES) =      3.46   PEAK FLOW RATE(CFS) =      1.63

****************************************************************************
  FLOW PROCESS FROM NODE  11911.00 TO NODE  11912.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2441.33  DOWNSTREAM(FEET) =   2382.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   397.30   CHANNEL SLOPE =  0.1488
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.012
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.79      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.63
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   1.82
  Tc(MIN.) =   14.01
  SUBAREA AREA(ACRES) =     5.79       SUBAREA RUNOFF(CFS) =    2.15
  EFFECTIVE AREA(ACRES) =      9.25     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =       3.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   3.86
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11912.00 =     914.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11912.00 TO NODE  11913.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2382.20  DOWNSTREAM(FEET) =   2263.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1891.47   CHANNEL SLOPE =  0.0626
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.702
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.30      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.32
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   9.50
  Tc(MIN.) =   23.51
  SUBAREA AREA(ACRES) =    54.30       SUBAREA RUNOFF(CFS) =    5.00
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  EFFECTIVE AREA(ACRES) =     63.55     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       63.5         PEAK FLOW RATE(CFS) =       5.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   3.20
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11913.00 =    2806.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11913.00 TO NODE  11914.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.77  DOWNSTREAM(FEET) =   1845.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1957.31   CHANNEL SLOPE =  0.2138
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.595
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       65.14      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.07
  AVERAGE FLOW DEPTH(FEET) =   0.63   TRAVEL TIME(MIN.) =   6.43
  Tc(MIN.) =   29.94
  SUBAREA AREA(ACRES) =    65.14       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    128.69     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      128.7         PEAK FLOW RATE(CFS) =       5.85
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   5.06
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11914.00 =    4763.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11914.00 TO NODE  11915.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1845.23  DOWNSTREAM(FEET) =   1557.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1686.78   CHANNEL SLOPE =  0.1708
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.545
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.52      0.60     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.68
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   6.01
  Tc(MIN.) =   35.95
  SUBAREA AREA(ACRES) =    78.52       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    207.21     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      207.2         PEAK FLOW RATE(CFS) =       5.85
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   4.68
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11915.00 =    6450.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11915.00 TO NODE  11916.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1557.21  DOWNSTREAM(FEET) =   1403.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.39   CHANNEL SLOPE =  0.0806
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.484
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       70.48      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.52
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   9.05
  Tc(MIN.) =   44.99
  SUBAREA AREA(ACRES) =    70.48       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    277.69     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      277.7         PEAK FLOW RATE(CFS) =       5.85
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   3.52
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11916.00 =    8359.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11916.00 TO NODE  11917.00 IS CODE =  51
----------------------------------------------------------------------------
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1403.38  DOWNSTREAM(FEET) =   1079.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1945.82   CHANNEL SLOPE =  0.1662
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.444
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      232.20      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   7.05
  Tc(MIN.) =   52.04
  SUBAREA AREA(ACRES) =   232.20       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    509.89     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      509.9         PEAK FLOW RATE(CFS) =       5.85
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   4.60
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11917.00 =   10305.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1079.99  DOWNSTREAM(FEET) =    873.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2563.91   CHANNEL SLOPE =  0.0804
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.391
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      110.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.52
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =  12.15
  Tc(MIN.) =   64.19
  SUBAREA AREA(ACRES) =   110.82       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    620.71     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
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  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      620.7         PEAK FLOW RATE(CFS) =       5.85
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   3.52
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   64.19
  RAINFALL INTENSITY(INCH/HR) =   0.39
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     620.71
  TOTAL STREAM AREA(ACRES) =     620.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.85

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       14.59   56.21    0.420  0.60( 0.59) 0.98     484.1   11900.00
      2        5.85   64.19    0.391  0.60( 0.60) 1.00     620.7   11910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       20.09   56.21    0.420  0.60( 0.60) 0.99    1027.6   11900.00
      2       19.44   64.19    0.391  0.60( 0.60) 0.99    1104.8   11910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.09    Tc(MIN.) =    56.21
  EFFECTIVE AREA(ACRES) =    1027.64   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     1104.8
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11920.00 TO NODE  11921.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    873.95  DOWNSTREAM(FEET) =    827.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1417.25   CHANNEL SLOPE =  0.0325
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
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  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.393
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      107.47      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.41
  AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   6.92
  Tc(MIN.) =   63.14
  SUBAREA AREA(ACRES) =   107.47       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1135.11     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1212.3         PEAK FLOW RATE(CFS) =      20.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.40   FLOW VELOCITY(FEET/SEC.) =   3.41
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11921.00 =   14286.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11921.00 TO NODE  11922.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    827.94  DOWNSTREAM(FEET) =    753.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.43   CHANNEL SLOPE =  0.0394
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.378
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      344.27      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.66
  AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   8.60
  Tc(MIN.) =   71.74
  SUBAREA AREA(ACRES) =   344.27       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1479.38     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1556.5         PEAK FLOW RATE(CFS) =      20.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   3.66
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 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11922.00 =   16173.28 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11922.00 TO NODE  11923.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    753.55  DOWNSTREAM(FEET) =    641.58
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.88   CHANNEL SLOPE =  0.0391
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.354
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      165.18      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.09
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.65
 AVERAGE FLOW DEPTH(FEET) =   1.36   TRAVEL TIME(MIN.) =  13.08
 Tc(MIN.) =   84.81
 SUBAREA AREA(ACRES) =   165.18       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   1644.56     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1721.7         PEAK FLOW RATE(CFS) =      20.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =   3.65
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11923.00 =   19034.16 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11923.00 TO NODE  11924.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    641.58  DOWNSTREAM(FEET) =    579.89
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1844.02   CHANNEL SLOPE =  0.0335
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.338
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      433.73      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.09
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.45
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 AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   8.91
 Tc(MIN.) =   93.72
 SUBAREA AREA(ACRES) =   433.73       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   2078.29     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     2155.4         PEAK FLOW RATE(CFS) =      20.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.39   FLOW VELOCITY(FEET/SEC.) =   3.45
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11924.00 =   20878.18 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11924.00 TO NODE  11925.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    579.89  DOWNSTREAM(FEET) =    494.12
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2756.15   CHANNEL SLOPE =  0.0311
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.311
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      265.42      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.09
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.35
 AVERAGE FLOW DEPTH(FEET) =   1.41   TRAVEL TIME(MIN.) =  13.72
 Tc(MIN.) =  107.44
 SUBAREA AREA(ACRES) =   265.42       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   2343.71     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     2420.9         PEAK FLOW RATE(CFS) =      20.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =   3.35
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11925.00 =   23634.33 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11925.00 TO NODE  11926.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    494.12  DOWNSTREAM(FEET) =    458.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1922.70   CHANNEL SLOPE =  0.0186
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```

```
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.288
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       97.46      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.09
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.75
 AVERAGE FLOW DEPTH(FEET) =   1.56   TRAVEL TIME(MIN.) =  11.63
 Tc(MIN.) =  119.08
 SUBAREA AREA(ACRES) =    97.46       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   2441.17     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     2518.3         PEAK FLOW RATE(CFS) =      20.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.56   FLOW VELOCITY(FEET/SEC.) =   2.75
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11926.00 =   25557.03 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11926.00 TO NODE  11927.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    458.40  DOWNSTREAM(FEET) =    399.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2170.13   CHANNEL SLOPE =  0.0274
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.276
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       53.83      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.09
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.20
 AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =  11.30
 Tc(MIN.) =  130.38
 SUBAREA AREA(ACRES) =    53.83       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   2495.00     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     2572.1         PEAK FLOW RATE(CFS) =      20.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =   3.20
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610401T.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       48.82   37.99  0.60( 0.60) 1.00     610.3   40120.00
     2       48.79   41.62  0.60( 0.60) 1.00     652.1   40100.00
   TOTAL AREA(ACRES) =      652.1

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       20.09  130.38    0.276  0.60( 0.60) 1.00    2495.0   11900.00
     2       19.44  139.06    0.268  0.60( 0.60) 1.00    2572.1   11910.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       48.82   37.99    0.529  0.60( 0.60) 1.00     610.3   40120.00
     2       48.79   41.62    0.503  0.60( 0.60) 1.00     652.1   40100.00
 LONGEST FLOWPATH FROM NODE  40100.00 TO NODE  11927.00 =   10245.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       60.02   37.99    0.529  0.60( 0.60) 1.00    1337.2   40120.00
     2       60.46   41.62    0.503  0.60( 0.60) 1.00    1448.4   40100.00
     3       46.88  130.38    0.276  0.60( 0.60) 1.00    3147.1   11900.00
     4       45.44  139.06    0.268  0.60( 0.60) 1.00    3224.2   11910.00
   TOTAL AREA(ACRES) =      3224.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       60.46  Tc(MIN.) =   41.615
 EFFECTIVE AREA(ACRES) =   1448.42  AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3224.2
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.50 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    399.00  DOWNSTREAM(FEET) =    384.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   986.26   CHANNEL SLOPE =  0.0152
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      60.46
 FLOW VELOCITY(FEET/SEC.) =   3.37   FLOW DEPTH(FEET) =   2.44
 TRAVEL TIME(MIN.) =   4.87   Tc(MIN.) =   46.49
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610402T.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1        9.62   15.91  0.60( 0.60) 1.00      33.3   40200.00
   TOTAL AREA(ACRES) =       33.3

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       60.02   42.87    0.496  0.60( 0.60) 1.00    1337.2   40120.00
     2       60.46   46.49    0.475  0.60( 0.60) 1.00    1448.4   40100.00
     3       46.88  135.58    0.271  0.60( 0.60) 1.00    3147.1   11900.00
     4       45.44  144.29    0.263  0.60( 0.60) 1.00    3224.2   11910.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        9.62   15.91    0.921  0.60( 0.60) 1.00      33.3   40200.00
 LONGEST FLOWPATH FROM NODE  40200.00 TO NODE  11927.50 =    1999.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       51.02   15.91    0.921  0.60( 0.60) 1.00     529.6   40200.00
     2       60.02   42.87    0.496  0.60( 0.60) 1.00    1370.5   40120.00
     3       60.46   46.49    0.475  0.60( 0.60) 1.00    1481.7   40100.00
     4       46.88  135.58    0.271  0.60( 0.60) 1.00    3180.4   11900.00
     5       45.44  144.29    0.263  0.60( 0.60) 1.00    3257.5   11910.00
   TOTAL AREA(ACRES) =      3257.5
```



```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       60.46  Tc(MIN.) =   46.488
 EFFECTIVE AREA(ACRES) =   1481.73  AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3257.5
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11928.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    384.00  DOWNSTREAM(FEET) =    359.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   647.19   CHANNEL SLOPE =  0.0386
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.462
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       78.01      0.50     0.984     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.72
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.78
 AVERAGE FLOW DEPTH(FEET) =   2.06   TRAVEL TIME(MIN.) =   2.26
 Tc(MIN.) =   48.74
 SUBAREA AREA(ACRES) =    78.01       SUBAREA RUNOFF(CFS) =    0.52
 EFFECTIVE AREA(ACRES) =   1559.74     AREA-AVERAGED Fm(INCH/HR) =   0.59
 AREA-AVERAGED Fp(INCH/HR) =   0.59  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     3335.5         PEAK FLOW RATE(CFS) =      60.46
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.06   FLOW VELOCITY(FEET/SEC.) =   4.77
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11928.00 =   29360.61 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      140.99   18.14    0.843  0.59( 0.59) 1.00     607.7   40200.00
     2       60.02   45.13    0.483  0.59( 0.59) 1.00    1448.5   40120.00
     3       60.46   48.74    0.462  0.59( 0.59) 1.00    1559.7   40100.00
     4       46.88  137.98    0.269  0.60( 0.60) 1.00    3258.4   11900.00
     5       45.44  146.72    0.261  0.60( 0.60) 1.00    3335.5   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     140.99  Tc(MIN.) =   18.14
 AREA-AVERAGED Fm(INCH/HR) =  0.59  AREA-AVERAGED Fp(INCH/HR) =  0.59
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =     607.65

****************************************************************************
 FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  51
----------------------------------------------------------------------------
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    359.00  DOWNSTREAM(FEET) =    341.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1322.66   CHANNEL SLOPE =  0.0131
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.697
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.18      0.60     0.890     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     141.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.94
  AVERAGE FLOW DEPTH(FEET) =   3.46   TRAVEL TIME(MIN.) =   5.59
  Tc(MIN.) =   23.73
  SUBAREA AREA(ACRES) =     8.18       SUBAREA RUNOFF(CFS) =    1.20
  EFFECTIVE AREA(ACRES) =    615.83     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.59  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3343.7         PEAK FLOW RATE(CFS) =     140.99
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.45   FLOW VELOCITY(FEET/SEC.) =   3.95
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11929.00 =   30683.27 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      140.99   23.73    0.697  0.59( 0.58) 1.00     615.8   40200.00
      2       60.02   52.03    0.444  0.59( 0.59) 1.00    1456.7   40120.00
      3       60.46   55.64    0.423  0.59( 0.59) 1.00    1567.9   40100.00
      4       46.88  145.33    0.262  0.60( 0.60) 1.00    3266.6   11900.00
      5       45.44  154.14    0.254  0.60( 0.60) 1.00    3343.7   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     140.99  Tc(MIN.) =   23.73
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.59
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =     615.83

****************************************************************************
  FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  11527.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  12527.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
```



```
  PEAK FLOWRATE TABLE FILE NAME: S18.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      368.84   67.70  0.60( 0.60) 0.99    5287.6   11831.00
      2      465.86   93.00  0.60( 0.60) 0.99    7636.5   11530.00
      3      535.61  108.86  0.60( 0.60) 0.99    9913.6   11701.00
      4      556.49  113.96  0.60( 0.60) 0.99   10677.4   11000.00
      5      648.13  131.47  0.60( 0.60) 1.00   14699.0   11350.00
      6      669.33  137.81  0.60( 0.60) 1.00   16198.5   10850.00
      7      634.13  145.71  0.60( 0.60) 1.00   17561.7   10800.00
      8      585.26  152.57  0.60( 0.60) 1.00   18544.6   11220.00
      9      518.72  163.20  0.60( 0.60) 1.00   19653.0   10910.00
     10      469.65  171.22  0.60( 0.60) 1.00   20292.8   10630.00
     11      347.20  209.11  0.60( 0.60) 1.00   24538.6   10600.00
     12      331.29  220.46  0.60( 0.60) 1.00   26191.2   11600.00
     13      323.11  238.06  0.60( 0.60) 1.00   28026.3   10710.00
     14      317.41  246.11  0.60( 0.60) 1.00   28547.9   10410.00
     15      303.38  267.54  0.60( 0.60) 1.00   29762.1   10700.00
     16      301.90  284.90  0.60( 0.60) 1.00   30777.1   10200.00
     17      295.76  302.98  0.60( 0.60) 1.00   31520.3   10320.00
     18      293.47  308.01  0.60( 0.60) 1.00   31667.4   10300.00
     19      283.38  326.44  0.60( 0.60) 1.00   31937.8   10210.00
     20      239.60  440.07  0.60( 0.60) 1.00   32916.6   10100.00
    TOTAL AREA(ACRES) =    32916.6

****************************************************************************
  FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================
  ***MEMORY BANK #  2 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
  FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S25.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      125.24  141.11  0.60( 0.59) 0.99    4845.7   12500.00
      2      161.52  169.33  0.60( 0.59) 0.99    6553.7   12300.00
      3      161.17  174.49  0.60( 0.59) 0.99    6933.7   12330.00
      4      157.95  201.22  0.60( 0.59) 0.98    8764.7   12410.00
      5      155.98  214.55  0.60( 0.59) 0.98    9660.0   12400.00
      6      155.19  218.06  0.60( 0.59) 0.98    9842.0   12211.00
      7      166.94  226.09  0.60( 0.59) 0.98   10505.5   12201.00
      8      174.98  233.46  0.60( 0.58) 0.97   10951.7   12261.00
      9      174.75  235.04  0.60( 0.58) 0.98   11005.8   12111.00
     10      174.24  239.60  0.60( 0.59) 0.98   11200.8   12231.00
     11      171.86  258.05  0.60( 0.59) 0.98   11864.6   12101.10
     12      151.86  297.99  0.60( 0.59) 0.98   13091.2   12010.00
     13       99.78  374.08  0.60( 0.59) 0.98   13237.1   12000.00
    TOTAL AREA(ACRES) =    13237.1

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
     1      125.24  141.11  0.60( 0.59) 0.99    4845.7   12500.00
     2      161.52  169.33  0.60( 0.59) 0.99    6553.7   12300.00
     3      161.17  174.49  0.60( 0.59) 0.99    6933.7   12330.00
     4      157.95  201.22  0.60( 0.59) 0.98    8764.7   12410.00
     5      155.98  214.55  0.60( 0.59) 0.98    9660.0   12400.00
     6      155.19  218.06  0.60( 0.59) 0.98    9842.0   12211.00
     7      166.94  226.09  0.60( 0.59) 0.98   10505.5   12201.00
     8      174.98  233.46  0.60( 0.58) 0.97   10951.7   12261.00
     9      174.75  235.04  0.60( 0.58) 0.98   11005.8   12111.00
    10      174.24  239.60  0.60( 0.59) 0.98   11200.8   12231.00
    11      171.86  258.05  0.60( 0.59) 0.98   11864.6   12101.10
    12      151.86  297.99  0.60( 0.59) 0.98   13091.2   12010.00
    13       99.78  374.08  0.60( 0.59) 0.98   13237.1   12000.00
   TOTAL AREA(ACRES) =     13237.1

****************************************************************************
 FLOW PROCESS FROM NODE  11841.00 TO NODE  12527.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1      125.24  141.11    0.266  0.60( 0.59) 0.99    4845.7   12500.00
     2      161.52  169.33    0.239  0.60( 0.59) 0.99    6553.7   12300.00
     3      161.17  174.49    0.234  0.60( 0.59) 0.99    6933.7   12330.00
     4      157.95  201.22    0.223  0.60( 0.59) 0.98    8764.7   12410.00
     5      155.98  214.55    0.219  0.60( 0.59) 0.98    9660.0   12400.00
     6      155.19  218.06    0.218  0.60( 0.59) 0.98    9842.0   12211.00
     7      166.94  226.09    0.215  0.60( 0.59) 0.98   10505.5   12201.00
     8      174.98  233.46    0.213  0.60( 0.58) 0.97   10951.7   12261.00
     9      174.75  235.04    0.212  0.60( 0.58) 0.98   11005.8   12111.00
    10      174.24  239.60    0.211  0.60( 0.59) 0.98   11200.8   12231.00
    11      171.86  258.05    0.206  0.60( 0.59) 0.98   11864.6   12101.10
    12      151.86  297.99    0.194  0.60( 0.59) 0.98   13091.2   12010.00
    13       99.78  374.08    0.173  0.60( 0.59) 0.98   13237.1   12000.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12527.00 =   77156.98 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1      368.84   67.70    0.385  0.60( 0.60) 0.99    5287.6   11831.00
     2      465.86   93.00    0.339  0.60( 0.60) 0.99    7636.5   11530.00
     3      535.61  108.86    0.308  0.60( 0.60) 0.99    9913.6   11701.00
     4      556.49  113.96    0.298  0.60( 0.60) 0.99   10677.4   11000.00
     5      648.13  131.47    0.275  0.60( 0.60) 1.00   14699.0   11350.00
     6      669.33  137.81    0.269  0.60( 0.60) 1.00   16198.5   10850.00
     7      634.13  145.71    0.262  0.60( 0.60) 1.00   17561.7   10800.00
     8      585.26  152.57    0.255  0.60( 0.60) 1.00   18544.6   11220.00
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     9      518.72  163.20    0.245  0.60( 0.60) 1.00   19653.0   10910.00
    10      469.65  171.22    0.237  0.60( 0.60) 1.00   20292.8   10630.00
    11      347.20  209.11    0.220  0.60( 0.60) 1.00   24538.6   10600.00
    12      331.29  220.46    0.217  0.60( 0.60) 1.00   26191.2   11600.00
    13      323.11  238.06    0.212  0.60( 0.60) 1.00   28026.3   10710.00
    14      317.41  246.11    0.209  0.60( 0.60) 1.00   28547.9   10410.00
    15      303.38  267.54    0.203  0.60( 0.60) 1.00   29762.1   10700.00
    16      301.90  284.90    0.198  0.60( 0.60) 1.00   30777.1   10200.00
    17      295.76  302.98    0.192  0.60( 0.60) 1.00   31520.3   10320.00
    18      293.47  308.01    0.191  0.60( 0.60) 1.00   31667.4   10300.00
    19      283.38  326.44    0.185  0.60( 0.60) 1.00   31937.8   10210.00
    20      239.60  440.07    0.166  0.60( 0.60) 1.00   32916.6   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12527.00 =   97868.13 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1      455.85   67.70    0.385  0.60( 0.60) 0.99    7612.4   11831.00
    2      571.10   93.00    0.339  0.60( 0.60) 0.99   10829.9   11530.00
    3      647.47  108.86    0.308  0.60( 0.60) 0.99   13651.8   11701.00
    4      669.77  113.96    0.298  0.60( 0.60) 0.99   14590.6   11000.00
    5      768.84  131.47    0.275  0.60( 0.60) 0.99   19213.6   11350.00
    6      793.08  137.81    0.269  0.60( 0.60) 0.99   20930.8   10850.00
    7      779.85  141.11    0.266  0.60( 0.60) 0.99   21614.0   12500.00
    8      765.28  145.71    0.262  0.60( 0.60) 0.99   22685.9   10800.00
    9      725.24  152.57    0.255  0.60( 0.60) 0.99   24084.1   11220.00
   10      672.36  163.20    0.245  0.60( 0.60) 0.99   25835.9   10910.00
   11      642.74  169.33    0.239  0.60( 0.60) 0.99   26695.6   12300.00
   12      631.04  171.22    0.237  0.60( 0.60) 0.99   26985.6   10630.00
   13      620.25  174.49    0.234  0.60( 0.60) 0.99   27593.1   12330.00
   14      530.62  201.22    0.223  0.60( 0.60) 0.99   32419.9   12410.00
   15      503.98  209.11    0.220  0.60( 0.60) 0.99   33832.7   10600.00
   16      495.54  214.55    0.219  0.60( 0.60) 0.99   34991.8   12400.00
   17      489.83  218.06    0.218  0.60( 0.59) 0.99   35684.9   12211.00
   18      489.98  220.46    0.217  0.60( 0.59) 0.99   36230.8   11600.00
   19      495.62  226.09    0.215  0.60( 0.59) 0.99   37284.2   12201.00
   20      500.23  233.46    0.213  0.60( 0.59) 0.99   38498.2   12261.00
   21      499.27  235.04    0.212  0.60( 0.59) 0.99   38717.5   12111.00
   22      497.52  238.06    0.212  0.60( 0.59) 0.99   39161.2   10710.00
   23      496.26  239.60    0.211  0.60( 0.59) 0.99   39327.0   12231.00
   24      490.81  246.11    0.209  0.60( 0.59) 0.99   39982.9   10410.00
   25      481.45  258.05    0.206  0.60( 0.59) 0.99   41088.7   12101.10
   26      470.48  267.54    0.203  0.60( 0.59) 0.99   41918.3   10700.00
   27      460.31  284.90    0.198  0.60( 0.59) 0.99   43466.5   10200.00
   28      449.32  297.99    0.194  0.60( 0.59) 0.99   44406.1   12010.00
   29      444.20  302.98    0.192  0.60( 0.59) 0.99   44621.2   10320.00
   30      438.47  308.01    0.191  0.60( 0.59) 0.99   44777.8   10300.00
   31      415.77  326.44    0.185  0.60( 0.60) 0.99   45083.6   10210.00
   32      364.80  374.08    0.173  0.60( 0.60) 0.99   45585.3   12000.00
   33      335.27  440.07    0.166  0.60( 0.60) 0.99   46153.7   10100.00
  TOTAL AREA(ACRES) =     46153.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      793.08  Tc(MIN.) =  137.811
EFFECTIVE AREA(ACRES) =  20930.83  AREA-AVERAGED Fm(INCH/HR) =  0.60
AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
TOTAL AREA(ACRES) =    46153.7
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12527.00 =   97868.13 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12527.00 TO NODE  11929.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    347.47  DOWNSTREAM(FEET) =    341.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =   532.38   CHANNEL SLOPE =  0.0110
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.268
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.37      0.60     0.987     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.987
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     793.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.69
  AVERAGE FLOW DEPTH(FEET) =   5.86   TRAVEL TIME(MIN.) =   1.15
  Tc(MIN.) =  138.96
  SUBAREA AREA(ACRES) =    14.37       SUBAREA RUNOFF(CFS) =    0.05
  EFFECTIVE AREA(ACRES) =  20945.20     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    46168.0         PEAK FLOW RATE(CFS) =     793.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.86   FLOW VELOCITY(FEET/SEC.) =   7.69
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11929.00 =   98400.52 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)      Ap     Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)     NODE
      1      455.85   69.03    0.383  0.60( 0.60) 0.99    7626.8   11831.00
      2      571.10   94.25    0.337  0.60( 0.60) 0.99   10844.3   11530.00
      3      647.47  110.08    0.306  0.60( 0.60) 0.99   13666.1   11701.00
      4      669.77  115.16    0.296  0.60( 0.60) 0.99   14605.0   11000.00
      5      768.84  132.63    0.274  0.60( 0.60) 0.99   19227.9   11350.00
      6      793.08  138.96    0.268  0.60( 0.60) 0.99   20945.2   10850.00
      7      779.85  142.27    0.265  0.60( 0.60) 0.99   21628.4   12500.00
      8      765.28  146.88    0.260  0.60( 0.60) 0.99   22700.3   10800.00
      9      725.24  153.75    0.254  0.60( 0.60) 0.99   24098.5   11220.00
     10      672.36  164.41    0.244  0.60( 0.60) 0.99   25850.3   10910.00
     11      642.74  170.54    0.238  0.60( 0.60) 0.99   26709.9   12300.00
     12      631.04  172.44    0.236  0.60( 0.60) 0.99   27000.0   10630.00
     13      620.25  175.72    0.233  0.60( 0.60) 0.99   27607.5   12330.00
     14      530.62  202.50    0.222  0.60( 0.60) 0.99   32434.3   12410.00
     15      503.98  210.40    0.220  0.60( 0.60) 0.99   33847.1   10600.00
     16      495.54  215.85    0.218  0.60( 0.60) 0.99   35006.2   12400.00
     17      489.83  219.36    0.217  0.60( 0.59) 0.99   35699.3   12211.00
     18      489.98  221.76    0.216  0.60( 0.59) 0.99   36245.2   11600.00
     19      495.62  227.39    0.215  0.60( 0.59) 0.99   37298.6   12201.00
```



```
     20      500.23  234.75    0.213  0.60( 0.59) 0.99   38512.5   12261.00
     21      499.27  236.34    0.212  0.60( 0.59) 0.99   38731.9   12111.00
     22      497.52  239.36    0.211  0.60( 0.59) 0.99   39175.6   10710.00
     23      496.26  240.90    0.211  0.60( 0.59) 0.99   39341.4   12231.00
     24      490.81  247.41    0.209  0.60( 0.59) 0.99   39997.3   10410.00
     25      481.45  259.36    0.205  0.60( 0.59) 0.99   41103.1   12101.10
     26      470.48  268.86    0.202  0.60( 0.59) 0.99   41932.7   10700.00
     27      460.31  286.22    0.197  0.60( 0.59) 0.99   43480.9   10200.00
     28      449.32  299.31    0.193  0.60( 0.59) 0.99   44420.5   12010.00
     29      444.20  304.32    0.192  0.60( 0.59) 0.99   44635.5   10320.00
     30      438.47  309.35    0.190  0.60( 0.59) 0.99   44792.2   10300.00
     31      415.77  327.79    0.185  0.60( 0.60) 0.99   45097.9   10210.00
     32      364.80  375.48    0.173  0.60( 0.60) 0.99   45599.6   12000.00
     33      335.27  441.50    0.166  0.60( 0.60) 0.99   46168.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     793.08  Tc(MIN.) =  138.96
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   20945.20

****************************************************************************
  FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)      Ap     Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)     NODE
      1      455.85   69.03    0.383  0.60( 0.60) 0.99    7626.8   11831.00
      2      571.10   94.25    0.337  0.60( 0.60) 0.99   10844.3   11530.00
      3      647.47  110.08    0.306  0.60( 0.60) 0.99   13666.1   11701.00
      4      669.77  115.16    0.296  0.60( 0.60) 0.99   14605.0   11000.00
      5      768.84  132.63    0.274  0.60( 0.60) 0.99   19227.9   11350.00
      6      793.08  138.96    0.268  0.60( 0.60) 0.99   20945.2   10850.00
      7      779.85  142.27    0.265  0.60( 0.60) 0.99   21628.4   12500.00
      8      765.28  146.88    0.260  0.60( 0.60) 0.99   22700.3   10800.00
      9      725.24  153.75    0.254  0.60( 0.60) 0.99   24098.5   11220.00
     10      672.36  164.41    0.244  0.60( 0.60) 0.99   25850.3   10910.00
     11      642.74  170.54    0.238  0.60( 0.60) 0.99   26709.9   12300.00
     12      631.04  172.44    0.236  0.60( 0.60) 0.99   27000.0   10630.00
     13      620.25  175.72    0.233  0.60( 0.60) 0.99   27607.5   12330.00
     14      530.62  202.50    0.222  0.60( 0.60) 0.99   32434.3   12410.00
     15      503.98  210.40    0.220  0.60( 0.60) 0.99   33847.1   10600.00
     16      495.54  215.85    0.218  0.60( 0.60) 0.99   35006.2   12400.00
     17      489.83  219.36    0.217  0.60( 0.59) 0.99   35699.3   12211.00
     18      489.98  221.76    0.216  0.60( 0.59) 0.99   36245.2   11600.00
     19      495.62  227.39    0.215  0.60( 0.59) 0.99   37298.6   12201.00
     20      500.23  234.75    0.213  0.60( 0.59) 0.99   38512.5   12261.00
     21      499.27  236.34    0.212  0.60( 0.59) 0.99   38731.9   12111.00
     22      497.52  239.36    0.211  0.60( 0.59) 0.99   39175.6   10710.00
     23      496.26  240.90    0.211  0.60( 0.59) 0.99   39341.4   12231.00
     24      490.81  247.41    0.209  0.60( 0.59) 0.99   39997.3   10410.00
     25      481.45  259.36    0.205  0.60( 0.59) 0.99   41103.1   12101.10
     26      470.48  268.86    0.202  0.60( 0.59) 0.99   41932.7   10700.00
     27      460.31  286.22    0.197  0.60( 0.59) 0.99   43480.9   10200.00
     28      449.32  299.31    0.193  0.60( 0.59) 0.99   44420.5   12010.00
     29      444.20  304.32    0.192  0.60( 0.59) 0.99   44635.5   10320.00
     30      438.47  309.35    0.190  0.60( 0.59) 0.99   44792.2   10300.00
```

31	415.77	327.79	0.185	0.60(0.60)	0.99	45097.9	10210.00
32	364.80	375.48	0.173	0.60(0.60)	0.99	45599.6	12000.00
33	335.27	441.50	0.166	0.60(0.60)	0.99	46168.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	140.99	23.73	0.697	0.59(0.58)	1.00	615.8	40200.00
2	60.02	52.03	0.444	0.59(0.59)	1.00	1456.7	40120.00
3	60.46	55.64	0.423	0.59(0.59)	1.00	1567.9	40100.00
4	46.88	145.33	0.262	0.60(0.60)	1.00	3266.6	11900.00
5	45.44	154.14	0.254	0.60(0.60)	1.00	3343.7	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	426.54	23.73	0.697	0.60(0.59)	0.99	3237.9	40200.00
2	458.29	52.03	0.444	0.60(0.59)	0.99	7205.6	40120.00
3	466.95	55.64	0.423	0.60(0.60)	0.99	7715.8	40100.00
4	514.29	69.03	0.383	0.60(0.60)	0.99	9448.2	11831.00
5	625.72	94.25	0.337	0.60(0.60)	0.99	13143.3	11530.00
6	699.69	110.08	0.306	0.60(0.60)	0.99	16265.0	11701.00
7	721.22	115.16	0.296	0.60(0.60)	0.99	17300.1	11000.00
8	817.64	132.63	0.274	0.60(0.60)	0.99	22254.0	11350.00
9	840.92	138.96	0.268	0.60(0.60)	0.99	24091.2	10850.00
10	827.20	142.27	0.265	0.60(0.60)	0.99	24837.0	12500.00
11	817.06	145.33	0.262	0.60(0.60)	0.99	25606.9	11900.00
12	811.91	146.88	0.260	0.60(0.60)	0.99	25980.4	10800.00
13	770.74	153.75	0.254	0.60(0.60)	0.99	27438.8	11220.00
14	768.74	154.14	0.254	0.60(0.60)	0.99	27506.3	11910.00
15	716.05	164.41	0.244	0.60(0.60)	0.99	29194.0	10910.00
16	685.39	170.54	0.238	0.60(0.60)	0.99	30053.6	12300.00
17	673.36	172.44	0.236	0.60(0.60)	0.99	30343.7	10630.00
18	662.01	175.72	0.233	0.60(0.60)	0.99	30951.2	12330.00
19	570.45	202.50	0.222	0.60(0.60)	0.99	35778.0	12410.00
20	543.38	210.40	0.220	0.60(0.60)	0.99	37190.8	10600.00
21	534.65	215.85	0.218	0.60(0.60)	0.99	38349.9	12400.00
22	528.75	219.36	0.217	0.60(0.60)	0.99	39043.0	12211.00
23	528.77	221.76	0.216	0.60(0.59)	0.99	39588.9	11600.00
24	534.10	227.39	0.215	0.60(0.59)	0.99	40642.3	12201.00
25	538.32	234.75	0.213	0.60(0.59)	0.99	41856.3	12261.00
26	537.27	236.34	0.212	0.60(0.59)	0.99	42075.6	12111.00
27	535.37	239.36	0.211	0.60(0.59)	0.99	42519.3	10710.00
28	534.02	240.90	0.211	0.60(0.59)	0.99	42685.1	12231.00
29	528.22	247.41	0.209	0.60(0.59)	0.99	43341.0	10410.00
30	518.22	259.36	0.205	0.60(0.59)	0.99	44446.8	12101.10
31	506.74	268.86	0.202	0.60(0.59)	0.99	45276.4	10700.00
32	495.63	286.22	0.197	0.60(0.59)	0.99	46824.6	10200.00
33	483.94	299.31	0.193	0.60(0.60)	0.99	47764.2	12010.00
34	478.55	304.32	0.192	0.60(0.60)	0.99	47979.3	10320.00
35	472.55	309.35	0.190	0.60(0.60)	0.99	48135.9	10300.00
36	448.86	327.79	0.185	0.60(0.60)	0.99	48441.6	10210.00
37	395.86	375.48	0.173	0.60(0.60)	0.99	48943.4	12000.00
38	365.05	441.50	0.166	0.60(0.60)	0.99	49511.8	10100.00

TOTAL AREA(ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 840.92 Tc(MIN.) = 138.964
EFFECTIVE AREA(ACRES) = 24091.17 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49511.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 49511.8 TC(MIN.) = 138.96
EFFECTIVE AREA(ACRES) = 24091.17 AREA-AVERAGED Fm(INCH/HR)= 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.995
PEAK FLOW RATE(CFS) = 840.92

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	426.54	23.73	0.697	0.60(0.59)	0.99	3237.9	40200.00
2	458.29	52.03	0.444	0.60(0.59)	0.99	7205.6	40120.00
3	466.95	55.64	0.423	0.60(0.60)	0.99	7715.8	40100.00
4	514.29	69.03	0.383	0.60(0.60)	0.99	9448.2	11831.00
5	625.72	94.25	0.337	0.60(0.60)	0.99	13143.3	11530.00
6	699.69	110.08	0.306	0.60(0.60)	0.99	16265.0	11701.00
7	721.22	115.16	0.296	0.60(0.60)	0.99	17300.1	11000.00
8	817.64	132.63	0.274	0.60(0.60)	0.99	22254.0	11350.00
9	840.92	138.96	0.268	0.60(0.60)	0.99	24091.2	10850.00
10	827.20	142.27	0.265	0.60(0.60)	0.99	24837.0	12500.00
11	817.06	145.33	0.262	0.60(0.60)	0.99	25606.9	11900.00
12	811.91	146.88	0.260	0.60(0.60)	0.99	25980.4	10800.00
13	770.74	153.75	0.254	0.60(0.60)	0.99	27438.8	11220.00
14	768.74	154.14	0.254	0.60(0.60)	0.99	27506.3	11910.00
15	716.05	164.41	0.244	0.60(0.60)	0.99	29194.0	10910.00
16	685.39	170.54	0.238	0.60(0.60)	0.99	30053.6	12300.00
17	673.36	172.44	0.236	0.60(0.60)	0.99	30343.7	10630.00
18	662.01	175.72	0.233	0.60(0.60)	0.99	30951.2	12330.00
19	570.45	202.50	0.222	0.60(0.60)	0.99	35778.0	12410.00
20	543.38	210.40	0.220	0.60(0.60)	0.99	37190.8	10600.00
21	534.65	215.85	0.218	0.60(0.60)	0.99	38349.9	12400.00
22	528.75	219.36	0.217	0.60(0.60)	0.99	39043.0	12211.00
23	528.77	221.76	0.216	0.60(0.59)	0.99	39588.9	11600.00
24	534.10	227.39	0.215	0.60(0.59)	0.99	40642.3	12201.00
25	538.32	234.75	0.213	0.60(0.59)	0.99	41856.3	12261.00
26	537.27	236.34	0.212	0.60(0.59)	0.99	42075.6	12111.00
27	535.37	239.36	0.211	0.60(0.59)	0.99	42519.3	10710.00
28	534.02	240.90	0.211	0.60(0.59)	0.99	42685.1	12231.00
29	528.22	247.41	0.209	0.60(0.59)	0.99	43341.0	10410.00
30	518.22	259.36	0.205	0.60(0.59)	0.99	44446.8	12101.10
31	506.74	268.86	0.202	0.60(0.59)	0.99	45276.4	10700.00
32	495.63	286.22	0.197	0.60(0.59)	0.99	46824.6	10200.00
33	483.94	299.31	0.193	0.60(0.60)	0.99	47764.2	12010.00
34	478.55	304.32	0.192	0.60(0.60)	0.99	47979.3	10320.00
35	472.55	309.35	0.190	0.60(0.60)	0.99	48135.9	10300.00
36	448.86	327.79	0.185	0.60(0.60)	0.99	48441.6	10210.00
37	395.86	375.48	0.173	0.60(0.60)	0.99	48943.4	12000.00
38	365.05	441.50	0.166	0.60(0.60)	0.99	49511.8	10100.00

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END OF RATIONAL METHOD ANALYSIS

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S20.DAT
  TIME/DATE OF STUDY: 14:36 04/03/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.756
   2)   10.00;  1.171
   3)   15.00;  0.905
   4)   20.00;  0.751
   5)   25.00;  0.652
   6)   30.00;  0.579
   7)   40.00;  0.498
   8)   50.00;  0.441
   9)   60.00;  0.396
  10)   90.00;  0.330
  11)  120.00;  0.285
  12)  180.00;  0.236
  13)  360.00;  0.170
  14) 1440.00;  0.074
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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 ************************************************************************
  FLOW PROCESS FROM NODE  12000.00 TO NODE  12001.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   965.01
  ELEVATION DATA: UPSTREAM(FEET) =   4506.20  DOWNSTREAM(FEET) =   4179.61

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.700
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.974
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        9.03      0.60     1.000     0   13.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.04
  TOTAL AREA(ACRES) =      9.03   PEAK FLOW RATE(CFS) =      3.04

 ************************************************************************
  FLOW PROCESS FROM NODE  12001.00 TO NODE  12002.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4179.61  DOWNSTREAM(FEET) =   3849.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.60   CHANNEL SLOPE =  0.3380
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.860
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       18.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.88
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   2.77
  Tc(MIN.) =   16.47
  SUBAREA AREA(ACRES) =    18.82       SUBAREA RUNOFF(CFS) =    4.40
  EFFECTIVE AREA(ACRES) =     27.85     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.8         PEAK FLOW RATE(CFS) =       6.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   6.19
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12002.00 =    1941.61 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  12002.00 TO NODE  12003.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   3849.51  DOWNSTREAM(FEET) =   3265.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1892.03   CHANNEL SLOPE =  0.3086
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.729
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.96      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.76
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   4.66
  Tc(MIN.) =   21.13
  SUBAREA AREA(ACRES) =    68.96       SUBAREA RUNOFF(CFS) =    7.99
  EFFECTIVE AREA(ACRES) =     96.81     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       96.8         PEAK FLOW RATE(CFS) =      11.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   6.88
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12003.00 =    3833.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3265.69  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3118.62   CHANNEL SLOPE =  0.2688
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.597
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.28      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.84
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   7.60
  Tc(MIN.) =   28.74
  SUBAREA AREA(ACRES) =   328.28       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    425.09     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      425.1         PEAK FLOW RATE(CFS) =      11.22
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   6.50
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.
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```
****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.74
  RAINFALL INTENSITY(INCH/HR) =   0.60
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     425.09
  TOTAL STREAM AREA(ACRES) =     425.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      11.22

****************************************************************************
  FLOW PROCESS FROM NODE  12010.00 TO NODE  12011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   264.80
  ELEVATION DATA: UPSTREAM(FEET) =   4208.12  DOWNSTREAM(FEET) =   4068.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.470
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.467
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.06      0.60     1.000     0    7.47
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.61
  TOTAL AREA(ACRES) =      2.06   PEAK FLOW RATE(CFS) =      1.61

****************************************************************************
  FLOW PROCESS FROM NODE  12011.00 TO NODE  12012.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4068.13  DOWNSTREAM(FEET) =   3694.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.45   CHANNEL SLOPE =  0.5703
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.257
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.98      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.07
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =    9.27
  SUBAREA AREA(ACRES) =     3.98       SUBAREA RUNOFF(CFS) =    2.35
  EFFECTIVE AREA(ACRES) =      6.04     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0          PEAK FLOW RATE(CFS) =       3.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   6.43
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12012.00 =     919.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12012.00 TO NODE  12013.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3694.92  DOWNSTREAM(FEET) =   3415.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   981.94   CHANNEL SLOPE =  0.2845
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.080
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.56      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.68
  AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   2.45
  Tc(MIN.) =   11.72
  SUBAREA AREA(ACRES) =    35.56       SUBAREA RUNOFF(CFS) =   15.35
  EFFECTIVE AREA(ACRES) =     41.60     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.6          PEAK FLOW RATE(CFS) =      17.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   7.47
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12013.00 =    1901.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12013.00 TO NODE  12014.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3415.55  DOWNSTREAM(FEET) =   2756.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.68   CHANNEL SLOPE =  0.3420
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.895
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.40      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.93
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   3.59
  Tc(MIN.) =   15.31
  SUBAREA AREA(ACRES) =    72.40       SUBAREA RUNOFF(CFS) =   19.26
  EFFECTIVE AREA(ACRES) =    114.00     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.0          PEAK FLOW RATE(CFS) =      30.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   9.07
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12014.00 =    3827.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2756.62  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1697.28   CHANNEL SLOPE =  0.1940
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.786
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      121.96      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.94
  AVERAGE FLOW DEPTH(FEET) =   1.31   TRAVEL TIME(MIN.) =   3.56
  Tc(MIN.) =   18.88
  SUBAREA AREA(ACRES) =   121.96       SUBAREA RUNOFF(CFS) =   20.39
  EFFECTIVE AREA(ACRES) =    235.96     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      236.0          PEAK FLOW RATE(CFS) =      39.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.29   FLOW VELOCITY(FEET/SEC.) =   7.87
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12020.00 =    5525.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.88
  RAINFALL INTENSITY(INCH/HR) =   0.79
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     235.96
  TOTAL STREAM AREA(ACRES) =     235.96
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      39.44

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       11.22   28.74    0.597  0.60( 0.60) 1.00     425.1   12000.00
     2       39.44   18.88    0.786  0.60( 0.60) 1.00     236.0   12010.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       49.13   18.88    0.786  0.60( 0.60) 1.00     515.2   12010.00
     2       11.22   28.74    0.597  0.60( 0.60) 1.00     661.0   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      49.13    Tc(MIN.) =    18.88
 EFFECTIVE AREA(ACRES) =     515.20   AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =      661.0
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12020.00 TO NODE  12021.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2427.28  DOWNSTREAM(FEET) =   2056.25
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2698.04   CHANNEL SLOPE =  0.1375
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.657
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      376.13      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.42
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.67
 AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   5.86
 Tc(MIN.) =   24.74
 SUBAREA AREA(ACRES) =   376.13       SUBAREA RUNOFF(CFS) =   19.39
 EFFECTIVE AREA(ACRES) =    891.33     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1037.2         PEAK FLOW RATE(CFS) =      49.13
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =   7.30
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12021.00 =    9650.30 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```



```
     1       49.13   24.74    0.657  0.60( 0.60) 1.00     891.3   12010.00
     2       11.22   37.62    0.517  0.60( 0.60) 1.00    1037.2   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =      49.13  Tc(MIN.) =   24.74
 AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =     891.33

****************************************************************************
 FLOW PROCESS FROM NODE  12021.00 TO NODE  12022.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2056.25  DOWNSTREAM(FEET) =   1864.68
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2552.86   CHANNEL SLOPE =  0.0750
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.563
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      347.45      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.83
 AVERAGE FLOW DEPTH(FEET) =   1.68   TRAVEL TIME(MIN.) =   7.29
 Tc(MIN.) =   32.03
 SUBAREA AREA(ACRES) =   347.45       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   1238.78     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1384.6         PEAK FLOW RATE(CFS) =      49.13
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.68   FLOW VELOCITY(FEET/SEC.) =   5.83
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12022.00 =   12203.16 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       49.13   32.03    0.563  0.60( 0.60) 1.00    1238.8   12010.00
     2       11.22   48.20    0.451  0.60( 0.60) 1.00    1384.6   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =      49.13  Tc(MIN.) =   32.03
 AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1238.78

****************************************************************************
 FLOW PROCESS FROM NODE  12022.00 TO NODE  12023.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
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 ELEVATION DATA: UPSTREAM(FEET) =   1864.68  DOWNSTREAM(FEET) =   1710.75
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.57   CHANNEL SLOPE =  0.0816
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.520
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      280.70      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.01
 AVERAGE FLOW DEPTH(FEET) =   1.65   TRAVEL TIME(MIN.) =   5.23
 Tc(MIN.) =   37.27
 SUBAREA AREA(ACRES) =   280.70       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   1519.48     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1665.3         PEAK FLOW RATE(CFS) =      49.13
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.65   FLOW VELOCITY(FEET/SEC.) =   6.01
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12023.00 =   14089.73 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       49.13   37.27    0.520  0.60( 0.60) 1.00    1519.5   12010.00
     2       11.22   55.77    0.415  0.60( 0.60) 1.00    1665.3   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =      49.13  Tc(MIN.) =   37.27
 AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1519.48

****************************************************************************
 FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1710.75  DOWNSTREAM(FEET) =   1672.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.87   CHANNEL SLOPE =  0.0196
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.461
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      248.35      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
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 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.52
 AVERAGE FLOW DEPTH(FEET) =   2.16   TRAVEL TIME(MIN.) =   9.20
 Tc(MIN.) =   46.47
 SUBAREA AREA(ACRES) =   248.35       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   1767.83     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1913.7         PEAK FLOW RATE(CFS) =      49.13
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.16   FLOW VELOCITY(FEET/SEC.) =   3.52
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12024.00 =   16034.60 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       49.13   46.47    0.461  0.60( 0.60) 1.00    1767.8   12010.00
     2       11.22   69.08    0.376  0.60( 0.60) 1.00    1913.7   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =      49.13  Tc(MIN.) =   46.47
 AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1767.83
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1913.7  TC(MIN.) =     46.47
 EFFECTIVE AREA(ACRES) =   1767.83  AREA-AVERAGED Fm(INCH/HR)=  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =      49.13

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       49.13   46.47    0.461  0.60( 0.60) 1.00    1767.8   12010.00
     2       11.22   69.08    0.376  0.60( 0.60) 1.00    1913.7   12000.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:
```

```
--------------------------------------------------------------------------
  FILE NAME: S21.DAT
  TIME/DATE OF STUDY: 14:36 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.756
   2)   10.00;  1.171
   3)   15.00;  0.905
   4)   20.00;  0.751
   5)   25.00;  0.652
   6)   30.00;  0.579
   7)   40.00;  0.498
   8)   50.00;  0.441
   9)   60.00;  0.396
  10)   90.00;  0.330
  11)  120.00;  0.285
  12)  180.00;  0.236
  13)  360.00;  0.170
  14) 1440.00;  0.074
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S20.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1       49.13   46.47  0.60( 0.60) 1.00    1767.8   12010.00
      2       11.22   69.08  0.60( 0.60) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =     1913.7

**************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1       49.13   46.47  0.60( 0.60) 1.00    1767.8   12010.00
      2       11.22   69.08  0.60( 0.60) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =      1913.7

**************************************************************************
  FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1672.60  DOWNSTREAM(FEET) =   1636.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   780.49   CHANNEL SLOPE =  0.0458
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.446
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       93.19      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.83
  AVERAGE FLOW DEPTH(FEET) =   1.84   TRAVEL TIME(MIN.) =   2.69
  Tc(MIN.) =   49.16
  SUBAREA AREA(ACRES) =    93.19       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1861.02     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2006.9         PEAK FLOW RATE(CFS) =      49.13
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  1.84   FLOW VELOCITY(FEET/SEC.) =   4.83
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       49.13   49.16    0.446  0.60( 0.60) 1.00    1861.0   12010.00
      2       11.22   72.97    0.367  0.60( 0.60) 1.00    2006.9   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      49.13  Tc(MIN.) =   49.16
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1861.02

****************************************************************************
  FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   49.16
  RAINFALL INTENSITY(INCH/HR) =   0.45
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1861.02
  TOTAL STREAM AREA(ACRES) =    2006.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      49.13

****************************************************************************
  FLOW PROCESS FROM NODE  12101.10 TO NODE  12101.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   847.57
  ELEVATION DATA: UPSTREAM(FEET) =   3435.00  DOWNSTREAM(FEET) =   2774.23

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.008
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.117
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        6.56      0.60     1.000     0   11.01
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.06
  TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =      3.06

****************************************************************************
  FLOW PROCESS FROM NODE  12101.20 TO NODE  12101.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2774.23  DOWNSTREAM(FEET) =   2097.09
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1205.19   CHANNEL SLOPE =  0.5619
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.987
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       34.88      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.18
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   13.46
  SUBAREA AREA(ACRES) =    34.88       SUBAREA RUNOFF(CFS) =   12.14
  EFFECTIVE AREA(ACRES) =     41.44     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.4          PEAK FLOW RATE(CFS) =      14.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.73   FLOW VELOCITY(FEET/SEC.) =   9.08
  LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12101.30 =    2052.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2097.09  DOWNSTREAM(FEET) =   1636.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1553.74   CHANNEL SLOPE =  0.2962
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.851
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       56.40      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.86
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   3.29
  Tc(MIN.) =   16.76
  SUBAREA AREA(ACRES) =    56.40       SUBAREA RUNOFF(CFS) =   12.74
  EFFECTIVE AREA(ACRES) =     97.84     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.8          PEAK FLOW RATE(CFS) =      22.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   8.02
  LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12102.00 =    3606.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.76
  RAINFALL INTENSITY(INCH/HR) =   0.85
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =      97.84
  TOTAL STREAM AREA(ACRES) =      97.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      22.10

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       49.13   49.16    0.446  0.60( 0.60) 1.00    1861.0   12010.00
      1       11.22   72.97    0.367  0.60( 0.60) 1.00    2006.9   12000.00
      2       22.10   16.76    0.851  0.60( 0.60) 1.00      97.8   12101.10

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.06   16.76    0.851  0.60( 0.60) 1.00     732.2   12101.10
      2       49.13   49.16    0.446  0.60( 0.60) 1.00    1958.9   12010.00
      3       11.22   72.97    0.367  0.60( 0.60) 1.00    2104.7   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      54.06    Tc(MIN.) =    16.76
  EFFECTIVE AREA(ACRES) =     732.21   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2104.7
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12102.00 TO NODE  12103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1636.82  DOWNSTREAM(FEET) =   1558.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2049.75   CHANNEL SLOPE =  0.0382
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.671
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.59      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.70
  AVERAGE FLOW DEPTH(FEET) =   2.02   TRAVEL TIME(MIN.) =   7.27
  Tc(MIN.) =   24.02
  SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =    7.50
```



```
  EFFECTIVE AREA(ACRES) =    848.80     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2221.3         PEAK FLOW RATE(CFS) =      54.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.98   FLOW VELOCITY(FEET/SEC.) =   4.65
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12103.00 =   18864.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.59   24.02    0.671  0.60( 0.60) 1.00     848.8   12101.10
      2       49.13   56.72    0.411  0.60( 0.60) 1.00    2075.5   12010.00
      3       11.22   83.91    0.343  0.60( 0.60) 1.00    2221.3   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      54.59  Tc(MIN.) =   24.02
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =     848.80

****************************************************************************
  FLOW PROCESS FROM NODE  12103.00 TO NODE  12104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1558.46  DOWNSTREAM(FEET) =   1453.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1971.34   CHANNEL SLOPE =  0.0531
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.577
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      355.30      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.23
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   6.28
  Tc(MIN.) =   30.30
  SUBAREA AREA(ACRES) =   355.30       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1204.10     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2576.6         PEAK FLOW RATE(CFS) =      54.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.86   FLOW VELOCITY(FEET/SEC.) =   5.23
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12104.00 =   20836.18 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.59   30.30    0.577  0.60( 0.60) 1.00    1204.1   12101.10
```

```
     2       49.13   63.14    0.389  0.60( 0.60) 1.00    2430.8   12010.00
     3       11.22   93.18    0.325  0.60( 0.60) 1.00    2576.6   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      54.59  Tc(MIN.) =   30.30
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1204.10

****************************************************************************
  FLOW PROCESS FROM NODE  12104.00 TO NODE  12105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1453.87  DOWNSTREAM(FEET) =   1369.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1885.63   CHANNEL SLOPE =  0.0446
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.525
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      200.37      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.91
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   6.40
  Tc(MIN.) =   36.70
  SUBAREA AREA(ACRES) =   200.37       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1404.47     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2777.0         PEAK FLOW RATE(CFS) =      54.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   4.91
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12105.00 =   22721.81 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.59   36.70    0.525  0.60( 0.60) 1.00    1404.5   12101.10
      2       49.13   69.71    0.375  0.60( 0.60) 1.00    2631.1   12010.00
      3       11.22  102.68    0.311  0.60( 0.60) 1.00    2777.0   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      54.59  Tc(MIN.) =   36.70
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1404.47

****************************************************************************
  FLOW PROCESS FROM NODE  12105.00 TO NODE  12106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1369.72  DOWNSTREAM(FEET) =   1298.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1910.12   CHANNEL SLOPE =  0.0374
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.477
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.52      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   1.99   TRAVEL TIME(MIN.) =   6.92
  Tc(MIN.) =   43.62
  SUBAREA AREA(ACRES) =   339.52       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1743.99     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3116.5         PEAK FLOW RATE(CFS) =      54.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.99   FLOW VELOCITY(FEET/SEC.) =   4.60
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12106.00 =   24631.93 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.59   43.62    0.477  0.60( 0.60) 1.00    1744.0   12101.10
      2       49.13   76.80    0.359  0.60( 0.60) 1.00    2970.6   12010.00
      3       11.22  112.91    0.296  0.60( 0.60) 1.00    3116.5   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      54.59  Tc(MIN.) =   43.62
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1743.99

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1298.29  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2982.44   CHANNEL SLOPE =  0.0277
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.415
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      164.97      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```

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  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.12
  AVERAGE FLOW DEPTH(FEET) =   2.10   TRAVEL TIME(MIN.) =  12.08
  Tc(MIN.) =   55.70
  SUBAREA AREA(ACRES) =   164.97       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1908.96     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3281.5         PEAK FLOW RATE(CFS) =      54.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.10   FLOW VELOCITY(FEET/SEC.) =   4.12
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.59   55.70    0.415  0.60( 0.60) 1.00    1909.0   12101.10
      2       49.13   89.17    0.332  0.60( 0.60) 1.00    3135.6   12010.00
      3       11.22  130.88    0.276  0.60( 0.60) 1.00    3281.5   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      54.59  Tc(MIN.) =   55.70
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1908.96

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   55.70
  RAINFALL INTENSITY(INCH/HR) =   0.42
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1908.96
  TOTAL STREAM AREA(ACRES) =    3281.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      54.59

****************************************************************************
  FLOW PROCESS FROM NODE  12111.00 TO NODE  12112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   939.51
  ELEVATION DATA: UPSTREAM(FEET) =   3108.05  DOWNSTREAM(FEET) =   2753.95

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.265
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.997
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.25      0.60     1.000     0   13.27
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.95
  TOTAL AREA(ACRES) =      8.25   PEAK FLOW RATE(CFS) =      2.95

****************************************************************************
  FLOW PROCESS FROM NODE  12112.00 TO NODE  12113.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2753.95  DOWNSTREAM(FEET) =   2458.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =   945.14   CHANNEL SLOPE =  0.3127
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.872
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.51      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   16.07
  SUBAREA AREA(ACRES) =    16.51       SUBAREA RUNOFF(CFS) =    4.05
  EFFECTIVE AREA(ACRES) =     24.76     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.8         PEAK FLOW RATE(CFS) =       6.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   5.92
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12113.00 =    1884.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12113.00 TO NODE  12114.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2458.45  DOWNSTREAM(FEET) =   1823.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.76   CHANNEL SLOPE =  0.3336
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.737
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       57.98      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.84
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   4.64
  Tc(MIN.) =   20.70
  SUBAREA AREA(ACRES) =    57.98       SUBAREA RUNOFF(CFS) =    7.16
  EFFECTIVE AREA(ACRES) =     82.74     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       82.7         PEAK FLOW RATE(CFS) =      10.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   6.86
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12114.00 =    3788.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12114.00 TO NODE  12115.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1823.37  DOWNSTREAM(FEET) =   1500.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.04   CHANNEL SLOPE =  0.1916
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.646
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.07      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.92
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   4.74
  Tc(MIN.) =   25.44
  SUBAREA AREA(ACRES) =   124.07       SUBAREA RUNOFF(CFS) =    5.10
  EFFECTIVE AREA(ACRES) =    206.81     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.8         PEAK FLOW RATE(CFS) =      10.22
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   5.58
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12115.00 =    5473.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1500.53  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.45   CHANNEL SLOPE =  0.1519
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.567
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.55      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.15
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   6.07
  Tc(MIN.) =   31.52
  SUBAREA AREA(ACRES) =    62.55       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    269.36     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      269.4         PEAK FLOW RATE(CFS) =      10.22
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   5.15
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12121.00 =    7348.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.52
  RAINFALL INTENSITY(INCH/HR) =   0.57
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     269.36
  TOTAL STREAM AREA(ACRES) =     269.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.22

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.59   55.70    0.415  0.60( 0.60) 1.00    1909.0   12101.10
      1       49.13   89.17    0.332  0.60( 0.60) 1.00    3135.6   12010.00
      1       11.22  130.88    0.276  0.60( 0.60) 1.00    3281.5   12000.00
      2       10.22   31.52    0.567  0.60( 0.60) 1.00     269.4   12111.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       52.37   31.52    0.567  0.60( 0.60) 1.00    1349.6   12111.00
      2       62.08   55.70    0.415  0.60( 0.60) 1.00    2178.3   12101.10
      3       55.11   89.17    0.332  0.60( 0.60) 1.00    3405.0   12010.00
      4       16.19  130.88    0.276  0.60( 0.60) 1.00    3550.8   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      62.08    Tc(MIN.) =    55.70
  EFFECTIVE AREA(ACRES) =    2178.32   AREA-AVERAGED Fm(INCH/HR) =  0.60
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  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3550.8
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12121.00 TO NODE  12241.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1215.72  DOWNSTREAM(FEET) =   1122.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3397.13   CHANNEL SLOPE =  0.0275
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.376
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      136.41      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.24
  AVERAGE FLOW DEPTH(FEET) =   2.21   TRAVEL TIME(MIN.) =  13.36
  Tc(MIN.) =   69.06
  SUBAREA AREA(ACRES) =   136.41       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2314.73     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3687.2         PEAK FLOW RATE(CFS) =      62.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.21   FLOW VELOCITY(FEET/SEC.) =   4.24
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       52.37   45.45    0.467  0.60( 0.60) 1.00    1486.0   12111.00
      2       62.08   69.06    0.376  0.60( 0.60) 1.00    2314.7   12101.10
      3       55.11  102.90    0.311  0.60( 0.60) 1.00    3541.4   12010.00
      4       16.19  149.50    0.261  0.60( 0.60) 1.00    3687.2   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      62.08  Tc(MIN.) =   69.06
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2314.73
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3687.2  TC(MIN.) =     69.06
  EFFECTIVE AREA(ACRES) =   2314.73  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      62.08

  ** PEAK FLOW RATE TABLE **
```



```
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       52.37   45.45    0.467  0.60( 0.60) 1.00    1486.0   12111.00
      2       62.08   69.06    0.376  0.60( 0.60) 1.00    2314.7   12101.10
      3       55.11  102.90    0.311  0.60( 0.60) 1.00    3541.4   12010.00
      4       16.19  149.50    0.261  0.60( 0.60) 1.00    3687.2   12000.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S22.DAT
  TIME/DATE OF STUDY: 14:36 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.756
   2)   10.00;  1.171
   3)   15.00;  0.905
   4)   20.00;  0.751
   5)   25.00;  0.652
   6)   30.00;  0.579
   7)   40.00;  0.498
   8)   50.00;  0.441
   9)   60.00;  0.396
  10)   90.00;  0.330
  11)  120.00;  0.285
  12)  180.00;  0.236
  13)  360.00;  0.170
  14) 1440.00;  0.074
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12201.00 TO NODE  12202.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   926.94
  ELEVATION DATA: UPSTREAM(FEET) =   3077.00  DOWNSTREAM(FEET) =   2740.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.295
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.996
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.74      0.60     1.000     0   13.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.05
  TOTAL AREA(ACRES) =      5.74   PEAK FLOW RATE(CFS) =      2.05

**************************************************************************
  FLOW PROCESS FROM NODE  12202.00 TO NODE  12203.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2740.64  DOWNSTREAM(FEET) =   2551.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   832.53   CHANNEL SLOPE =  0.2271
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.868
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       18.85      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.77
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   2.91
  Tc(MIN.) =   16.21
  SUBAREA AREA(ACRES) =    18.85       SUBAREA RUNOFF(CFS) =    4.55
  EFFECTIVE AREA(ACRES) =     24.59     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.6         PEAK FLOW RATE(CFS) =       5.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   5.22
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12203.00 =    1759.47 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12203.00 TO NODE  12204.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2551.60  DOWNSTREAM(FEET) =   2151.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.86   CHANNEL SLOPE =  0.1944
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.706
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.93      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.66
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   6.05
  Tc(MIN.) =   22.26
  SUBAREA AREA(ACRES) =    83.93       SUBAREA RUNOFF(CFS) =    8.04
  EFFECTIVE AREA(ACRES) =    108.52     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      108.5         PEAK FLOW RATE(CFS) =      10.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   5.65
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12204.00 =    3816.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12204.00 TO NODE  12205.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2151.76  DOWNSTREAM(FEET) =   1788.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2363.99   CHANNEL SLOPE =  0.1538
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.581
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      182.26      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.16
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   7.63
  Tc(MIN.) =   29.89
  SUBAREA AREA(ACRES) =   182.26       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    290.78     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      290.8         PEAK FLOW RATE(CFS) =      10.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.82   FLOW VELOCITY(FEET/SEC.) =   5.16
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12205.00 =    6180.32 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  12205.00 TO NODE  12206.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1788.16  DOWNSTREAM(FEET) =   1385.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2825.33   CHANNEL SLOPE =  0.1424
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.504
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      153.05      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.05
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   9.33
  Tc(MIN.) =   39.22
  SUBAREA AREA(ACRES) =   153.05       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    443.83     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      443.8         PEAK FLOW RATE(CFS) =      10.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   5.05
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12206.00 =    9005.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1385.78  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3579.23   CHANNEL SLOPE =  0.1061
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.429
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.52      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.47
  AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =  13.34
```

```
  Tc(MIN.) =   52.56
  SUBAREA AREA(ACRES) =   132.52       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    576.35     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      576.4         PEAK FLOW RATE(CFS) =      10.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   4.47
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   52.56
  RAINFALL INTENSITY(INCH/HR) =   0.43
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     576.35
  TOTAL STREAM AREA(ACRES) =     576.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.40

****************************************************************************
  FLOW PROCESS FROM NODE  12211.00 TO NODE  12212.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   733.41
  ELEVATION DATA: UPSTREAM(FEET) =   1669.93  DOWNSTREAM(FEET) =   1536.26

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.893
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.964
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                   -        8.90      0.60     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.92
  TOTAL AREA(ACRES) =      8.90   PEAK FLOW RATE(CFS) =      2.92

****************************************************************************
  FLOW PROCESS FROM NODE  12212.00 TO NODE  12213.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1536.26  DOWNSTREAM(FEET) =   1416.02
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1253.05   CHANNEL SLOPE =  0.0960
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.755
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       17.91      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.50
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   5.97
  Tc(MIN.) =   19.86
  SUBAREA AREA(ACRES) =    17.91       SUBAREA RUNOFF(CFS) =    2.50
  EFFECTIVE AREA(ACRES) =     26.81     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       26.8         PEAK FLOW RATE(CFS) =       3.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   3.39
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12213.00 =    1986.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12213.00 TO NODE  12214.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1416.02  DOWNSTREAM(FEET) =   1234.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1877.62   CHANNEL SLOPE =  0.0966
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.602
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      125.19      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.67
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   8.54
  Tc(MIN.) =   28.40
  SUBAREA AREA(ACRES) =   125.19       SUBAREA RUNOFF(CFS) =    0.28
  EFFECTIVE AREA(ACRES) =    152.00     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      152.0         PEAK FLOW RATE(CFS) =       3.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   3.39
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12214.00 =    3864.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

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  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1234.66  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2510.91   CHANNEL SLOPE =  0.0910
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.492
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.35      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.30
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =  12.68
  Tc(MIN.) =   41.08
  SUBAREA AREA(ACRES) =   339.35       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    491.35     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      491.4         PEAK FLOW RATE(CFS) =       3.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   3.30
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12221.00 =    6374.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.08
  RAINFALL INTENSITY(INCH/HR) =   0.49
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     491.35
  TOTAL STREAM AREA(ACRES) =     491.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.75

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.40   52.56    0.429  0.60( 0.60) 1.00     576.4   12201.00
      2        3.75   41.08    0.492  0.60( 0.60) 1.00     491.4   12211.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
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```
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       13.05   41.08    0.492  0.60( 0.60) 1.00     941.8   12211.00
      2       13.67   52.56    0.429  0.60( 0.60) 1.00    1067.7   12201.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      13.67    Tc(MIN.) =    52.56
  EFFECTIVE AREA(ACRES) =    1067.70   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1067.7
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1006.12  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.84   CHANNEL SLOPE =  0.0459
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.388
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.60      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.51
  AVERAGE FLOW DEPTH(FEET) =   1.14   TRAVEL TIME(MIN.) =  11.23
  Tc(MIN.) =   63.79
  SUBAREA AREA(ACRES) =   127.60       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1195.30     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1195.3         PEAK FLOW RATE(CFS) =      13.67
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.14   FLOW VELOCITY(FEET/SEC.) =   3.51
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       13.05   52.41    0.430  0.60( 0.60) 1.00    1069.4   12211.00
      2       13.67   63.79    0.388  0.60( 0.60) 1.00    1195.3   12201.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      13.67  Tc(MIN.) =   63.79
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1195.30

****************************************************************************
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```
 FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12231.00 TO NODE  12231.50 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   553.71
 ELEVATION DATA: UPSTREAM(FEET) =   2687.04  DOWNSTREAM(FEET) =   2470.68

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.660
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.136
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        3.48      0.60     1.000     0   10.66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      1.68
 TOTAL AREA(ACRES) =      3.48   PEAK FLOW RATE(CFS) =      1.68

****************************************************************************
 FLOW PROCESS FROM NODE  12231.50 TO NODE  12232.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2470.68  DOWNSTREAM(FEET) =   2375.54
 CHANNEL LENGTH THRU SUBAREA(FEET) =   410.38   CHANNEL SLOPE =  0.2318
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.060
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       12.43      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.27
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.79
 AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   1.43
 Tc(MIN.) =   12.09
 SUBAREA AREA(ACRES) =    12.43       SUBAREA RUNOFF(CFS) =    5.15
 EFFECTIVE AREA(ACRES) =     15.91     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       15.9         PEAK FLOW RATE(CFS) =       6.59

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   5.40
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12232.00 =     964.09 FEET.

****************************************************************************
```



```
 FLOW PROCESS FROM NODE  12232.00 TO NODE  12233.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2375.54  DOWNSTREAM(FEET) =   2252.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =   939.16   CHANNEL SLOPE =  0.1305
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.892
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       17.65      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.93
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.67
 AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   3.35
 Tc(MIN.) =   15.44
 SUBAREA AREA(ACRES) =    17.65       SUBAREA RUNOFF(CFS) =    4.63
 EFFECTIVE AREA(ACRES) =     33.56     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       33.6         PEAK FLOW RATE(CFS) =       8.81

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   4.63
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12233.00 =    1903.25 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12233.00 TO NODE  12234.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2252.99  DOWNSTREAM(FEET) =   2163.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =   976.53   CHANNEL SLOPE =  0.0921
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.775
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       19.54      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.36
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.29
 AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   3.79
 Tc(MIN.) =   19.23
 SUBAREA AREA(ACRES) =    19.54       SUBAREA RUNOFF(CFS) =    3.07
 EFFECTIVE AREA(ACRES) =     53.10     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       53.1         PEAK FLOW RATE(CFS) =       8.81
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   4.07
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  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12234.00 =    2879.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12234.00 TO NODE  12235.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2163.07  DOWNSTREAM(FEET) =   2018.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.65   CHANNEL SLOPE =  0.0759
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.617
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.14      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.89
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   8.18
  Tc(MIN.) =   27.41
  SUBAREA AREA(ACRES) =    51.14       SUBAREA RUNOFF(CFS) =    0.78
  EFFECTIVE AREA(ACRES) =    104.24     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =       8.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   3.79
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12235.00 =    4789.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12235.00 TO NODE  12236.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2018.08  DOWNSTREAM(FEET) =   1607.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.94   CHANNEL SLOPE =  0.2162
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.555
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   5.61
  Tc(MIN.) =   33.02
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    151.68     AREA-AVERAGED Fm(INCH/HR) =   0.60
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  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =       8.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.72   FLOW VELOCITY(FEET/SEC.) =   5.63
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12236.00 =    6686.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12236.00 TO NODE  12237.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1607.89  DOWNSTREAM(FEET) =   1326.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2213.20   CHANNEL SLOPE =  0.1273
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.492
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.00      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.63
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   7.96
  Tc(MIN.) =   40.98
  SUBAREA AREA(ACRES) =    87.00       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    238.68     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      238.7         PEAK FLOW RATE(CFS) =       8.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   4.63
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12237.00 =    8899.57 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1326.23  DOWNSTREAM(FEET) =   1122.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2236.51   CHANNEL SLOPE =  0.0912
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.440
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       81.83      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.07
  AVERAGE FLOW DEPTH(FEET) =   0.85   TRAVEL TIME(MIN.) =   9.16
  Tc(MIN.) =   50.15
  SUBAREA AREA(ACRES) =    81.83       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    320.51     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      320.5         PEAK FLOW RATE(CFS) =       8.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   4.07
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S21.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       52.37   45.45  0.60( 0.60) 1.00    1486.0   12111.00
      2       62.08   69.06  0.60( 0.60) 1.00    2314.7   12101.10
      3       55.11  102.90  0.60( 0.60) 1.00    3541.4   12010.00
      4       16.19  149.50  0.60( 0.60) 1.00    3687.2   12000.00
    TOTAL AREA(ACRES) =     3687.2

****************************************************************************
  FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       52.37   45.45  0.60( 0.60) 1.00    1486.0   12111.00
      2       62.08   69.06  0.60( 0.60) 1.00    2314.7   12101.10
      3       55.11  102.90  0.60( 0.60) 1.00    3541.4   12010.00
      4       16.19  149.50  0.60( 0.60) 1.00    3687.2   12000.00
    TOTAL AREA(ACRES) =      3687.2
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       52.37   45.45    0.467  0.60( 0.60) 1.00    1486.0   12111.00
      2       62.08   69.06    0.376  0.60( 0.60) 1.00    2314.7   12101.10
      3       55.11  102.90    0.311  0.60( 0.60) 1.00    3541.4   12010.00
      4       16.19  149.50    0.261  0.60( 0.60) 1.00    3687.2   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        8.81   50.15    0.440  0.60( 0.60) 1.00     320.5   12231.00
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       60.83   45.45    0.467  0.60( 0.60) 1.00    1776.5   12111.00
      2       63.11   50.15    0.440  0.60( 0.60) 1.00    1971.5   12231.00
      3       69.61   69.06    0.376  0.60( 0.60) 1.00    2635.2   12101.10
      4       61.33  102.90    0.311  0.60( 0.60) 1.00    3861.9   12010.00
      5       21.41  149.50    0.261  0.60( 0.60) 1.00    4007.7   12000.00
    TOTAL AREA(ACRES) =      4007.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       69.61  Tc(MIN.) =   69.058
  EFFECTIVE AREA(ACRES) =   2635.24  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     4007.7
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12241.00 TO NODE  12242.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1122.29  DOWNSTREAM(FEET) =   1062.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.03   CHANNEL SLOPE =  0.0291
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.359
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      219.09      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.60
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.45
  AVERAGE FLOW DEPTH(FEET) =   2.28   TRAVEL TIME(MIN.) =   7.69
  Tc(MIN.) =   76.75
  SUBAREA AREA(ACRES) =   219.09       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   2854.33     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     4226.8          PEAK FLOW RATE(CFS) =      69.61
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.28   FLOW VELOCITY(FEET/SEC.) =   4.45
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12242.00 =   33064.53 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       60.83   53.39    0.426  0.60( 0.60) 1.00    1995.5   12111.00
      2       63.11   58.02    0.405  0.60( 0.60) 1.00    2190.6   12231.00
      3       69.61   76.75    0.359  0.60( 0.60) 1.00    2854.3   12101.10
      4       61.33  110.84    0.299  0.60( 0.60) 1.00    4081.0   12010.00
      5       21.41  159.82    0.252  0.60( 0.60) 1.00    4226.8   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      69.61  Tc(MIN.) =   76.75
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2854.33

****************************************************************************
  FLOW PROCESS FROM NODE  12242.00 TO NODE  12243.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1062.50  DOWNSTREAM(FEET) =    998.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.30   CHANNEL SLOPE =  0.0331
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.344
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      249.96      0.60     0.995     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.68
  AVERAGE FLOW DEPTH(FEET) =   2.23   TRAVEL TIME(MIN.) =   6.88
  Tc(MIN.) =   83.64
  SUBAREA AREA(ACRES) =   249.96       SUBAREA RUNOFF(CFS) =    0.39
  EFFECTIVE AREA(ACRES) =   3104.29     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     4476.8          PEAK FLOW RATE(CFS) =      69.61
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```



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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.22   FLOW VELOCITY(FEET/SEC.) =   4.69
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12243.00 =   34995.83 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       60.83   60.49    0.395  0.60( 0.60) 1.00    2245.5   12111.00
      2       63.11   65.06    0.385  0.60( 0.60) 1.00    2440.5   12231.00
      3       69.61   83.64    0.344  0.60( 0.60) 1.00    3104.3   12101.10
      4       61.33  117.93    0.288  0.60( 0.60) 1.00    4330.9   12010.00
      5       21.41  169.08    0.245  0.60( 0.60) 1.00    4476.8   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      69.61  Tc(MIN.) =   83.64
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3104.29

****************************************************************************
  FLOW PROCESS FROM NODE  12243.00 TO NODE  12244.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    998.53  DOWNSTREAM(FEET) =    926.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1863.28   CHANNEL SLOPE =  0.0389
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.330
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      166.97      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.96
  AVERAGE FLOW DEPTH(FEET) =   2.16   TRAVEL TIME(MIN.) =   6.26
  Tc(MIN.) =   89.89
  SUBAREA AREA(ACRES) =   166.97       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   3271.26     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     4643.8          PEAK FLOW RATE(CFS) =      69.61
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.16   FLOW VELOCITY(FEET/SEC.) =   4.96
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12244.00 =   36859.11 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       60.83   66.96    0.381  0.60( 0.60) 1.00    2412.5   12111.00
      2       63.11   71.48    0.371  0.60( 0.60) 1.00    2607.5   12231.00
```

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     3       69.61   89.89    0.330  0.60( 0.60) 1.00    3271.3   12101.10
     4       61.33  124.40    0.281  0.60( 0.60) 1.00    4497.9   12010.00
     5       21.41  177.50    0.238  0.60( 0.60) 1.00    4643.8   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      69.61  Tc(MIN.) =   89.89
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3271.26

****************************************************************************
  FLOW PROCESS FROM NODE  12244.00 TO NODE  12251.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    926.00  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1665.37   CHANNEL SLOPE =  0.0170
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.319
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.41      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.65
  AVERAGE FLOW DEPTH(FEET) =   2.52   TRAVEL TIME(MIN.) =   7.61
  Tc(MIN.) =   97.50
  SUBAREA AREA(ACRES) =    83.41       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   3354.67     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     4727.2         PEAK FLOW RATE(CFS) =      69.61
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.52   FLOW VELOCITY(FEET/SEC.) =   3.65
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       60.83   74.84    0.363  0.60( 0.60) 1.00    2495.9   12111.00
      2       63.11   79.28    0.354  0.60( 0.60) 1.00    2690.9   12231.00
      3       69.61   97.50    0.319  0.60( 0.60) 1.00    3354.7   12101.10
      4       61.33  132.27    0.275  0.60( 0.60) 1.00    4581.3   12010.00
      5       21.41  187.73    0.233  0.60( 0.60) 1.00    4727.2   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      69.61  Tc(MIN.) =   97.50
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3354.67

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  11
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----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       60.83   74.84    0.363  0.60( 0.60) 1.00    2495.9   12111.00
      2       63.11   79.28    0.354  0.60( 0.60) 1.00    2690.9   12231.00
      3       69.61   97.50    0.319  0.60( 0.60) 1.00    3354.7   12101.10
      4       61.33  132.27    0.275  0.60( 0.60) 1.00    4581.3   12010.00
      5       21.41  187.73    0.233  0.60( 0.60) 1.00    4727.2   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       13.05   52.41    0.430  0.60( 0.60) 1.00    1069.4   12211.00
      2       13.67   63.79    0.388  0.60( 0.60) 1.00    1195.3   12201.00
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       63.48   52.41    0.430  0.60( 0.60) 1.00    2817.0   12211.00
      2       68.99   63.79    0.388  0.60( 0.60) 1.00    3322.5   12201.00
      3       73.64   74.84    0.363  0.60( 0.60) 1.00    3691.2   12111.00
      4       75.58   79.28    0.354  0.60( 0.60) 1.00    3886.2   12231.00
      5       80.84   97.50    0.319  0.60( 0.60) 1.00    4550.0   12101.10
      6       71.02  132.27    0.275  0.60( 0.60) 1.00    5776.6   12010.00
      7       29.63  187.73    0.233  0.60( 0.60) 1.00    5922.5   12000.00
    TOTAL AREA(ACRES) =      5922.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       80.84  Tc(MIN.) =   97.504
  EFFECTIVE AREA(ACRES) =   4549.97  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5922.5
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    897.69  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2133.08   CHANNEL SLOPE =  0.0238
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.306
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.79      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
```

```
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      80.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.29
  AVERAGE FLOW DEPTH(FEET) =   2.51   TRAVEL TIME(MIN.) =   8.29
  Tc(MIN.) =  105.80
  SUBAREA AREA(ACRES) =    85.79       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   4635.76     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     6008.3         PEAK FLOW RATE(CFS) =      80.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.51   FLOW VELOCITY(FEET/SEC.) =   4.29
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12281.00 =   40657.56 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       63.48   61.23    0.393  0.60( 0.60) 1.00    2902.8   12211.00
      2       68.99   72.41    0.369  0.60( 0.60) 1.00    3408.3   12201.00
      3       73.64   83.33    0.345  0.60( 0.60) 1.00    3777.0   12111.00
      4       75.58   87.71    0.335  0.60( 0.60) 1.00    3972.0   12231.00
      5       80.84  105.80    0.306  0.60( 0.60) 1.00    4635.8   12101.10
      6       71.02  140.81    0.268  0.60( 0.60) 1.00    5862.4   12010.00
      7       29.63  198.40    0.229  0.60( 0.60) 1.00    6008.3   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      80.84  Tc(MIN.) =  105.80
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    4635.76

****************************************************************************
  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  105.80
  RAINFALL INTENSITY(INCH/HR) =   0.31
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    4635.76
  TOTAL STREAM AREA(ACRES) =    6008.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      80.84

****************************************************************************
  FLOW PROCESS FROM NODE  12261.00 TO NODE  12261.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   378.71
  ELEVATION DATA: UPSTREAM(FEET) =   2264.27  DOWNSTREAM(FEET) =   2072.51

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```



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  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.694
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.324
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.96      0.60     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.93
  TOTAL AREA(ACRES) =      2.96   PEAK FLOW RATE(CFS) =      1.93

****************************************************************************
  FLOW PROCESS FROM NODE  12261.50 TO NODE  12262.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2072.51  DOWNSTREAM(FEET) =   1875.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   609.41   CHANNEL SLOPE =  0.3233
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.142
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        9.89      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.50
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   1.85
  Tc(MIN.) =   10.54
  SUBAREA AREA(ACRES) =     9.89       SUBAREA RUNOFF(CFS) =    4.83
  EFFECTIVE AREA(ACRES) =     12.85     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.9         PEAK FLOW RATE(CFS) =       6.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   6.00
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12262.00 =     988.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12262.00 TO NODE  12263.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1875.51  DOWNSTREAM(FEET) =   1686.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.89   CHANNEL SLOPE =  0.1957
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.990
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       22.00      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.64
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =   13.40
  SUBAREA AREA(ACRES) =    22.00       SUBAREA RUNOFF(CFS) =    7.73
  EFFECTIVE AREA(ACRES) =     34.85     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.8         PEAK FLOW RATE(CFS) =      12.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   5.86
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12263.00 =    1956.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12263.00 TO NODE  12264.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1686.10  DOWNSTREAM(FEET) =   1572.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.28   CHANNEL SLOPE =  0.1198
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.863
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.72      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.29
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   2.97
  Tc(MIN.) =   16.37
  SUBAREA AREA(ACRES) =    35.72       SUBAREA RUNOFF(CFS) =    8.45
  EFFECTIVE AREA(ACRES) =     70.57     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =      16.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   5.29
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12264.00 =    2900.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12264.00 TO NODE  12265.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1572.93  DOWNSTREAM(FEET) =   1506.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =   569.03   CHANNEL SLOPE =  0.1169
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.811
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       43.21      0.60     0.886     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.886
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.66
  AVERAGE FLOW DEPTH(FEET) =   1.14   TRAVEL TIME(MIN.) =   1.68
  Tc(MIN.) =   18.05
  SUBAREA AREA(ACRES) =    43.21       SUBAREA RUNOFF(CFS) =   10.87
  EFFECTIVE AREA(ACRES) =    113.78     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      113.8         PEAK FLOW RATE(CFS) =      24.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   5.76
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12265.00 =    3469.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12265.00 TO NODE  12266.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.41  DOWNSTREAM(FEET) =   1311.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2121.93   CHANNEL SLOPE =  0.0920
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.667
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.55      0.60     0.710     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.710
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.70
  AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   6.20
  Tc(MIN.) =   24.25
  SUBAREA AREA(ACRES) =    84.55       SUBAREA RUNOFF(CFS) =   18.33
  EFFECTIVE AREA(ACRES) =    198.33     AREA-AVERAGED Fm(INCH/HR) =   0.51
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.85
  TOTAL AREA(ACRES) =      198.3         PEAK FLOW RATE(CFS) =      27.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =   5.48
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12266.00 =    5591.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12266.00 TO NODE  12267.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1311.17  DOWNSTREAM(FEET) =   1232.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1555.18   CHANNEL SLOPE =  0.0506
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.585
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -      160.37      0.60     0.633     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.633
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.28
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.87
 AVERAGE FLOW DEPTH(FEET) =   1.72   TRAVEL TIME(MIN.) =   5.32
 Tc(MIN.) =   29.58
 SUBAREA AREA(ACRES) =   160.37       SUBAREA RUNOFF(CFS) =   31.00
 EFFECTIVE AREA(ACRES) =    358.70     AREA-AVERAGED Fm(INCH/HR) =   0.45
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.75
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      358.7         PEAK FLOW RATE(CFS) =      46.50

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =   4.96
 LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12267.00 =    7146.43 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12267.00 TO NODE  12268.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1232.47  DOWNSTREAM(FEET) =   1141.79
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2111.19   CHANNEL SLOPE =  0.0430
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.522
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -      100.65      0.60     0.970     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.970
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.21
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.68
 AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   7.52
 Tc(MIN.) =   37.10
 SUBAREA AREA(ACRES) =   100.65       SUBAREA RUNOFF(CFS) =    1.42
 EFFECTIVE AREA(ACRES) =    459.35     AREA-AVERAGED Fm(INCH/HR) =   0.48
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.80
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      459.4         PEAK FLOW RATE(CFS) =      46.50
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =   4.65
 LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12268.00 =    9257.62 FEET.

****************************************************************************
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```
 FLOW PROCESS FROM NODE  12268.00 TO NODE  12269.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1141.79  DOWNSTREAM(FEET) =   1115.83
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1295.17   CHANNEL SLOPE =  0.0200
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.480
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -      103.26      0.60     0.838     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.838
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.12
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.57
 AVERAGE FLOW DEPTH(FEET) =   2.16   TRAVEL TIME(MIN.) =   6.05
 Tc(MIN.) =   43.15
 SUBAREA AREA(ACRES) =   103.26       SUBAREA RUNOFF(CFS) =    7.23
 EFFECTIVE AREA(ACRES) =    562.61     AREA-AVERAGED Fm(INCH/HR) =   0.48
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.81
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      562.6         PEAK FLOW RATE(CFS) =      46.68

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.11   FLOW VELOCITY(FEET/SEC.) =   3.50
 LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.00 =   10552.79 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12269.00 TO NODE  12269.50 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1115.83  DOWNSTREAM(FEET) =   1100.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1137.63   CHANNEL SLOPE =  0.0139
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.445
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -       50.20      0.60     0.708     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.708
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.62
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.10
 AVERAGE FLOW DEPTH(FEET) =   2.31   TRAVEL TIME(MIN.) =   6.11
 Tc(MIN.) =   49.26
 SUBAREA AREA(ACRES) =    50.20       SUBAREA RUNOFF(CFS) =    5.87
 EFFECTIVE AREA(ACRES) =    612.81     AREA-AVERAGED Fm(INCH/HR) =   0.48
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.80
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      612.8         PEAK FLOW RATE(CFS) =      49.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.30   FLOW VELOCITY(FEET/SEC.) =   3.09
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.50 =   11690.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.50 TO NODE  12270.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1091.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1219.38   CHANNEL SLOPE =  0.0073
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.408
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.30      0.60     0.583     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.583
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.52
  AVERAGE FLOW DEPTH(FEET) =   2.74   TRAVEL TIME(MIN.) =   8.05
  Tc(MIN.) =   57.31
  SUBAREA AREA(ACRES) =    98.30       SUBAREA RUNOFF(CFS) =   15.06
  EFFECTIVE AREA(ACRES) =    711.11     AREA-AVERAGED Fm(INCH/HR) =   0.46
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.77
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      711.1         PEAK FLOW RATE(CFS) =      60.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.80   FLOW VELOCITY(FEET/SEC.) =   2.56
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12270.00 =   12909.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12270.00 TO NODE  12271.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1091.06  DOWNSTREAM(FEET) =    962.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1995.19   CHANNEL SLOPE =  0.0646
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.390
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.93      0.60     0.746     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.746
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      68.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.98
  AVERAGE FLOW DEPTH(FEET) =   1.95   TRAVEL TIME(MIN.) =   5.56
  Tc(MIN.) =   62.87
  SUBAREA AREA(ACRES) =   181.93       SUBAREA RUNOFF(CFS) =   16.21
  EFFECTIVE AREA(ACRES) =    893.04     AREA-AVERAGED Fm(INCH/HR) =   0.46
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.76
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      893.0         PEAK FLOW RATE(CFS) =      73.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.01   FLOW VELOCITY(FEET/SEC.) =   6.08
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12271.00 =   14904.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12271.00 TO NODE  12272.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    962.23  DOWNSTREAM(FEET) =    917.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1613.85   CHANNEL SLOPE =  0.0278
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.376
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.79      0.60     0.910     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.48
  AVERAGE FLOW DEPTH(FEET) =   2.38   TRAVEL TIME(MIN.) =   6.00
  Tc(MIN.) =   68.87
  SUBAREA AREA(ACRES) =   181.79       SUBAREA RUNOFF(CFS) =    5.54
  EFFECTIVE AREA(ACRES) =   1074.83     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.79
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1074.8         PEAK FLOW RATE(CFS) =      76.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.39   FLOW VELOCITY(FEET/SEC.) =   4.49
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12272.00 =   16518.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    917.38  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3182.34   CHANNEL SLOPE =  0.0221
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.348
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.99      0.60     0.948     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.948
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.13
  AVERAGE FLOW DEPTH(FEET) =   2.50   TRAVEL TIME(MIN.) =  12.86
  Tc(MIN.) =   81.73
  SUBAREA AREA(ACRES) =    79.99       SUBAREA RUNOFF(CFS) =    1.30
  EFFECTIVE AREA(ACRES) =   1154.82     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.80
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1154.8         PEAK FLOW RATE(CFS) =      76.67
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.49   FLOW VELOCITY(FEET/SEC.) =   4.12
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12281.00 =   19701.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   81.73
  RAINFALL INTENSITY(INCH/HR) =   0.35
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.80
  EFFECTIVE STREAM AREA(ACRES) =    1154.82
  TOTAL STREAM AREA(ACRES) =    1154.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      76.67

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       63.48   61.23    0.393  0.60( 0.60) 1.00    2902.8   12211.00
      1       68.99   72.41    0.369  0.60( 0.60) 1.00    3408.3   12201.00
      1       73.64   83.33    0.345  0.60( 0.60) 1.00    3777.0   12111.00
      1       75.58   87.71    0.335  0.60( 0.60) 1.00    3972.0   12231.00
      1       80.84  105.80    0.306  0.60( 0.60) 1.00    4635.8   12101.10
      1       71.02  140.81    0.268  0.60( 0.60) 1.00    5862.4   12010.00
      1       29.63  198.40    0.229  0.60( 0.60) 1.00    6008.3   12000.00
      2       76.67   81.73    0.348  0.60( 0.48) 0.80    1154.8   12261.00
```



```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      128.36   61.23    0.393  0.60( 0.57) 0.95    3768.0   12211.00
      2      140.91   72.41    0.369  0.60( 0.57) 0.95    4431.4   12201.00
      3      149.63   81.73    0.348  0.60( 0.57) 0.95    4877.7   12261.00
      4      149.53   83.33    0.345  0.60( 0.57) 0.95    4931.8   12111.00
      5      149.35   87.71    0.335  0.60( 0.57) 0.95    5126.8   12231.00
      6      148.29  105.80    0.306  0.60( 0.58) 0.96    5790.6   12101.10
      7      130.03  140.81    0.268  0.60( 0.58) 0.97    7017.2   12010.00
      8       80.11  198.40    0.229  0.60( 0.58) 0.97    7163.1   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     149.63    Tc(MIN.) =    81.73
  EFFECTIVE AREA(ACRES) =    4877.65   AREA-AVERAGED Fm(INCH/HR) =  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     7163.1
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12281.00 =   40657.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12281.00 TO NODE  12282.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    846.91  DOWNSTREAM(FEET) =    835.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1561.00   CHANNEL SLOPE =  0.0072
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.330
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      267.56      0.60     0.867     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.23
  AVERAGE FLOW DEPTH(FEET) =   4.00   TRAVEL TIME(MIN.) =   8.06
  Tc(MIN.) =   89.79
  SUBAREA AREA(ACRES) =   267.56       SUBAREA RUNOFF(CFS) =   10.58
  EFFECTIVE AREA(ACRES) =   5145.21     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.95
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     7430.6         PEAK FLOW RATE(CFS) =     149.63
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.95   FLOW VELOCITY(FEET/SEC.) =   3.20
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12282.00 =   42218.56 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	69.57	0.375	0.60(0.57)	0.95	4035.5	12211.00
2	140.91	80.59	0.351	0.60(0.57)	0.95	4699.0	12201.00
3	149.63	89.79	0.330	0.60(0.57)	0.95	5145.2	12261.00
4	149.53	91.38	0.328	0.60(0.57)	0.95	5199.4	12111.00
5	149.35	95.77	0.321	0.60(0.57)	0.95	5394.4	12231.00
6	148.29	113.88	0.294	0.60(0.57)	0.96	6058.1	12101.10
7	130.03	149.16	0.261	0.60(0.58)	0.96	7284.8	12010.00
8	80.11	207.80	0.226	0.60(0.58)	0.96	7430.6	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 149.63 Tc(MIN.) = 89.79
AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 5145.21

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 7430.6 TC(MIN.) = 89.79
EFFECTIVE AREA(ACRES) = 5145.21 AREA-AVERAGED Fm(INCH/HR)= 0.57
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.948
PEAK FLOW RATE(CFS) = 149.63

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	69.57	0.375	0.60(0.57)	0.95	4035.5	12211.00
2	140.91	80.59	0.351	0.60(0.57)	0.95	4699.0	12201.00
3	149.63	89.79	0.330	0.60(0.57)	0.95	5145.2	12261.00
4	149.53	91.38	0.328	0.60(0.57)	0.95	5199.4	12111.00
5	149.35	95.77	0.321	0.60(0.57)	0.95	5394.4	12231.00
6	148.29	113.88	0.294	0.60(0.57)	0.96	6058.1	12101.10
7	130.03	149.16	0.261	0.60(0.58)	0.96	7284.8	12010.00
8	80.11	207.80	0.226	0.60(0.58)	0.96	7430.6	12000.00

==========

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END OF RATIONAL METHOD ANALYSIS

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S23.DAT
  TIME/DATE OF STUDY: 14:37 04/03/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.756
   2)   10.00;  1.171
   3)   15.00;  0.905
   4)   20.00;  0.751
   5)   25.00;  0.652
   6)   30.00;  0.579
   7)   40.00;  0.498
   8)   50.00;  0.441
   9)   60.00;  0.396
  10)   90.00;  0.330
  11)  120.00;  0.285
  12)  180.00;  0.236
  13)  360.00;  0.170
  14) 1440.00;  0.074
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  12300.00 TO NODE  12301.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   924.36
  ELEVATION DATA: UPSTREAM(FEET) =   1712.53  DOWNSTREAM(FEET) =   1490.12

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.417
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.936
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.60     1.000     0   14.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.01
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =      2.01

 ************************************************************************
  FLOW PROCESS FROM NODE  12301.00 TO NODE  12302.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1490.12  DOWNSTREAM(FEET) =   1117.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1564.45   CHANNEL SLOPE =  0.2380
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.768
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.97      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.18
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   5.03
  Tc(MIN.) =   19.45
  SUBAREA AREA(ACRES) =    39.97       SUBAREA RUNOFF(CFS) =    6.05
  EFFECTIVE AREA(ACRES) =     46.63     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       46.6         PEAK FLOW RATE(CFS) =       7.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   5.54
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12302.00 =    2488.81 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
```

ELEVATION DATA: UPSTREAM(FEET) = 1117.78 DOWNSTREAM(FEET) = 780.80
CHANNEL LENGTH THRU SUBAREA(FEET) = 2216.41 CHANNEL SLOPE = 0.1520
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.620
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.51	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.75
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.78
AVERAGE FLOW DEPTH(FEET) = 0.74 TRAVEL TIME(MIN.) = 7.73
Tc(MIN.) = 27.18
SUBAREA AREA(ACRES) = 51.51 SUBAREA RUNOFF(CFS) = 0.94
EFFECTIVE AREA(ACRES) = 98.14 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 98.1 PEAK FLOW RATE(CFS) = 7.05
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 4.71
LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

****
FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 10

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==

****
FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: S22.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	69.57	0.60(0.57)	0.95	4035.5	12211.00
2	140.91	80.59	0.60(0.57)	0.95	4699.0	12201.00
3	149.63	89.79	0.60(0.57)	0.95	5145.2	12261.00
4	149.53	91.38	0.60(0.57)	0.95	5199.4	12111.00
5	149.35	95.77	0.60(0.57)	0.95	5394.4	12231.00
6	148.29	113.88	0.60(0.57)	0.96	6058.1	12101.10
7	130.03	149.16	0.60(0.58)	0.96	7284.8	12010.00
8	80.11	207.80	0.60(0.58)	0.96	7430.6	12000.00

TOTAL AREA(ACRES) = 7430.6

****
FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 14.0

>>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	69.57	0.60(0.57)	0.95	4035.5	12211.00
2	140.91	80.59	0.60(0.57)	0.95	4699.0	12201.00
3	149.63	89.79	0.60(0.57)	0.95	5145.2	12261.00
4	149.53	91.38	0.60(0.57)	0.95	5199.4	12111.00
5	149.35	95.77	0.60(0.57)	0.95	5394.4	12231.00
6	148.29	113.88	0.60(0.57)	0.96	6058.1	12101.10
7	130.03	149.16	0.60(0.58)	0.96	7284.8	12010.00
8	80.11	207.80	0.60(0.58)	0.96	7430.6	12000.00

TOTAL AREA(ACRES) = 7430.6

****
FLOW PROCESS FROM NODE 12282.00 TO NODE 12320.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 835.60 DOWNSTREAM(FEET) = 780.80
CHANNEL LENGTH THRU SUBAREA(FEET) = 1568.10 CHANNEL SLOPE = 0.0349
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.324
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.15	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 149.63
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.77
AVERAGE FLOW DEPTH(FEET) = 2.94 TRAVEL TIME(MIN.) = 4.53
Tc(MIN.) = 94.32
SUBAREA AREA(ACRES) = 51.15 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 5196.36 AREA-AVERAGED Fm(INCH/HR) = 0.57
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 7481.8 PEAK FLOW RATE(CFS) = 149.63
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.94 FLOW VELOCITY(FEET/SEC.) = 5.77
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	74.27	0.365	0.60(0.57)	0.95	4086.7	12211.00
2	140.91	85.18	0.341	0.60(0.57)	0.95	4750.2	12201.00
3	149.63	94.32	0.324	0.60(0.57)	0.95	5196.4	12261.00
4	149.53	95.91	0.321	0.60(0.57)	0.95	5250.5	12111.00
5	149.35	100.30	0.315	0.60(0.57)	0.95	5445.5	12231.00
6	148.29	118.41	0.287	0.60(0.57)	0.96	6109.3	12101.10
7	130.03	153.85	0.257	0.60(0.58)	0.96	7335.9	12010.00
8	80.11	213.09	0.224	0.60(0.58)	0.96	7481.8	12000.00

NEW PEAK FLOW DATA ARE:

```
  PEAK FLOW RATE(CFS) =     149.63  Tc(MIN.) =   94.32
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    5196.36

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      128.36   74.27    0.365  0.60( 0.57) 0.95    4086.7   12211.00
      2      140.91   85.18    0.341  0.60( 0.57) 0.95    4750.2   12201.00
      3      149.63   94.32    0.324  0.60( 0.57) 0.95    5196.4   12261.00
      4      149.53   95.91    0.321  0.60( 0.57) 0.95    5250.5   12111.00
      5      149.35  100.30    0.315  0.60( 0.57) 0.95    5445.5   12231.00
      6      148.29  118.41    0.287  0.60( 0.57) 0.96    6109.3   12101.10
      7      130.03  153.85    0.257  0.60( 0.58) 0.96    7335.9   12010.00
      8       80.11  213.09    0.224  0.60( 0.58) 0.96    7481.8   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        7.05   27.18    0.620  0.60( 0.60) 1.00      98.1   12300.00
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      135.36   27.18    0.620  0.60( 0.57) 0.95    1593.9   12300.00
      2      128.36   74.27    0.365  0.60( 0.57) 0.95    4184.8   12211.00
      3      140.91   85.18    0.341  0.60( 0.57) 0.95    4848.3   12201.00
      4      149.63   94.32    0.324  0.60( 0.57) 0.95    5294.5   12261.00
      5      149.53   95.91    0.321  0.60( 0.57) 0.95    5348.6   12111.00
      6      149.35  100.30    0.315  0.60( 0.57) 0.95    5543.7   12231.00
      7      148.29  118.41    0.287  0.60( 0.57) 0.96    6207.4   12101.10
      8      130.03  153.85    0.257  0.60( 0.58) 0.96    7434.1   12010.00
      9       80.11  213.09    0.224  0.60( 0.58) 0.96    7579.9   12000.00
    TOTAL AREA(ACRES) =      7579.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     149.63  Tc(MIN.) =   94.324
  EFFECTIVE AREA(ACRES) =   5294.50  AREA-AVERAGED Fm(INCH/HR) =  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     7579.9
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12320.00 TO NODE  12321.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    780.80  DOWNSTREAM(FEET) =    761.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2102.41   CHANNEL SLOPE =  0.0091
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  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.308
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      180.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     149.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.49
  AVERAGE FLOW DEPTH(FEET) =   3.78   TRAVEL TIME(MIN.) =  10.05
  Tc(MIN.) =  104.37
  SUBAREA AREA(ACRES) =   180.82       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   5475.32     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.95
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     7760.8          PEAK FLOW RATE(CFS) =     149.63
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.78   FLOW VELOCITY(FEET/SEC.) =   3.49
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12321.00 =   45889.07 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      135.36   37.49    0.518  0.60( 0.57) 0.96    1774.8   12300.00
      2      128.36   84.69    0.342  0.60( 0.57) 0.95    4365.6   12211.00
      3      140.91   95.38    0.322  0.60( 0.57) 0.95    5029.1   12201.00
      4      149.63  104.37    0.308  0.60( 0.57) 0.95    5475.3   12261.00
      5      149.53  105.96    0.306  0.60( 0.57) 0.95    5529.5   12111.00
      6      149.35  110.35    0.299  0.60( 0.57) 0.95    5724.5   12231.00
      7      148.29  128.46    0.278  0.60( 0.57) 0.96    6388.3   12101.10
      8      130.03  164.26    0.249  0.60( 0.58) 0.96    7614.9   12010.00
      9       80.11  224.85    0.220  0.60( 0.58) 0.97    7760.8   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     149.63  Tc(MIN.) =  104.37
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    5475.32

****************************************************************************
  FLOW PROCESS FROM NODE  12321.00 TO NODE  12322.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    761.66  DOWNSTREAM(FEET) =    710.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.13   CHANNEL SLOPE =  0.0268
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.299
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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  USER-DEFINED               -      217.17      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     149.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.23
  AVERAGE FLOW DEPTH(FEET) =   3.09   TRAVEL TIME(MIN.) =   6.10
  Tc(MIN.) =  110.47
  SUBAREA AREA(ACRES) =   217.17       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   5692.49     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.95
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     7977.9         PEAK FLOW RATE(CFS) =     149.63
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.09   FLOW VELOCITY(FEET/SEC.) =   5.23
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12322.00 =   47805.20 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      135.36   43.74    0.477  0.60( 0.58) 0.96    1991.9   12300.00
      2      128.36   91.05    0.328  0.60( 0.57) 0.95    4582.8   12211.00
      3      140.91  101.57    0.313  0.60( 0.57) 0.95    5246.3   12201.00
      4      149.63  110.47    0.299  0.60( 0.57) 0.95    5692.5   12261.00
      5      149.53  112.06    0.297  0.60( 0.57) 0.95    5746.6   12111.00
      6      149.35  116.46    0.290  0.60( 0.57) 0.96    5941.7   12231.00
      7      148.29  134.58    0.273  0.60( 0.58) 0.96    6605.4   12101.10
      8      130.03  170.59    0.244  0.60( 0.58) 0.97    7832.1   12010.00
      9       80.11  231.99    0.217  0.60( 0.58) 0.97    7977.9   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     149.63  Tc(MIN.) =  110.47
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    5692.49

****************************************************************************
  FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    710.30  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1977.07   CHANNEL SLOPE =  0.0162
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.288
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.67      0.60     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     149.65
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.34
  AVERAGE FLOW DEPTH(FEET) =   3.39   TRAVEL TIME(MIN.) =   7.60
  Tc(MIN.) =  118.07
  SUBAREA AREA(ACRES) =   194.67       SUBAREA RUNOFF(CFS) =    0.05
  EFFECTIVE AREA(ACRES) =   5887.16     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.95
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     8172.6         PEAK FLOW RATE(CFS) =     149.63
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.39   FLOW VELOCITY(FEET/SEC.) =   4.33
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      135.36   51.54    0.434  0.60( 0.58) 0.96    2186.6   12300.00
      2      128.36   98.94    0.317  0.60( 0.57) 0.96    4777.5   12211.00
      3      140.91  109.28    0.301  0.60( 0.57) 0.96    5441.0   12201.00
      4      149.63  118.07    0.288  0.60( 0.57) 0.95    5887.2   12261.00
      5      149.53  119.67    0.285  0.60( 0.57) 0.95    5941.3   12111.00
      6      149.35  124.06    0.282  0.60( 0.57) 0.96    6136.3   12231.00
      7      148.29  142.21    0.267  0.60( 0.58) 0.96    6800.1   12101.10
      8      130.03  178.46    0.237  0.60( 0.58) 0.97    8026.7   12010.00
      9       80.11  240.87    0.214  0.60( 0.58) 0.97    8172.6   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     149.63  Tc(MIN.) =  118.07
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    5887.16

****************************************************************************
  FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  118.07
  RAINFALL INTENSITY(INCH/HR) =   0.29
  AREA-AVERAGED Fm(INCH/HR) =  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.95
  EFFECTIVE STREAM AREA(ACRES) =    5887.16
  TOTAL STREAM AREA(ACRES) =    8172.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     149.63

****************************************************************************
  FLOW PROCESS FROM NODE  12330.00 TO NODE  12331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   994.42
  ELEVATION DATA: UPSTREAM(FEET) =   1754.00  DOWNSTREAM(FEET) =   1530.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.046
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.904
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        3.33      0.60     1.000     0   15.05
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      3.33   PEAK FLOW RATE(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE  12331.00 TO NODE  12332.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1530.30  DOWNSTREAM(FEET) =   1412.81
  CHANNEL LENGTH THRU SUBAREA(FEET) =   946.66   CHANNEL SLOPE =  0.1241
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.767
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.08      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.55
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   4.45
  Tc(MIN.) =   19.49
  SUBAREA AREA(ACRES) =    28.08       SUBAREA RUNOFF(CFS) =    4.21
  EFFECTIVE AREA(ACRES) =     31.41     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.4         PEAK FLOW RATE(CFS) =       4.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   3.88
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12332.00 =    1941.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12332.00 TO NODE  12333.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1412.81  DOWNSTREAM(FEET) =   1235.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.37   CHANNEL SLOPE =  0.0907
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.598
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       44.96      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.55
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   9.19
  Tc(MIN.) =   28.68
  SUBAREA AREA(ACRES) =    44.96       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =     76.37     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =       76.4         PEAK FLOW RATE(CFS) =       4.71
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   3.46
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12333.00 =    3900.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12333.00 TO NODE  12334.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1235.19  DOWNSTREAM(FEET) =   1013.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1921.81   CHANNEL SLOPE =  0.1151
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.521
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.50      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.79
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   8.45
  Tc(MIN.) =   37.13
  SUBAREA AREA(ACRES) =    30.50       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    106.87     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      106.9         PEAK FLOW RATE(CFS) =       4.71
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   3.79
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12334.00 =    5822.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12334.00 TO NODE  12335.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1013.96  DOWNSTREAM(FEET) =    809.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2029.80   CHANNEL SLOPE =  0.1006
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.461
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.62
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   9.35
  Tc(MIN.) =   46.48
  SUBAREA AREA(ACRES) =   145.82       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =       4.71
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   3.62
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12335.00 =    7852.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    809.84  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.44   CHANNEL SLOPE =  0.0691
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.411
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.71      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.15
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =  10.09
  Tc(MIN.) =   56.57
  SUBAREA AREA(ACRES) =    50.71       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    303.40     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
```



```
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      303.4         PEAK FLOW RATE(CFS) =       4.71
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   3.15
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12340.00 =    9757.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   56.57
  RAINFALL INTENSITY(INCH/HR) =   0.41
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     303.40
  TOTAL STREAM AREA(ACRES) =     303.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.71

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      135.36   51.54    0.434  0.60( 0.58) 0.96    2186.6   12300.00
      1      128.36   98.94    0.317  0.60( 0.57) 0.96    4777.5   12211.00
      1      140.91  109.28    0.301  0.60( 0.57) 0.96    5441.0   12201.00
      1      149.63  118.07    0.288  0.60( 0.57) 0.95    5887.2   12261.00
      1      149.53  119.67    0.285  0.60( 0.57) 0.95    5941.3   12111.00
      1      149.35  124.06    0.282  0.60( 0.57) 0.96    6136.3   12231.00
      1      148.29  142.21    0.267  0.60( 0.58) 0.96    6800.1   12101.10
      1      130.03  178.46    0.237  0.60( 0.58) 0.97    8026.7   12010.00
      1       80.11  240.87    0.214  0.60( 0.58) 0.97    8172.6   12000.00
      2        4.71   56.57    0.411  0.60( 0.60) 1.00     303.4   12330.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      139.89   51.54    0.434  0.60( 0.58) 0.97    2463.0   12300.00
      2      139.33   56.57    0.411  0.60( 0.58) 0.97    2765.2   12330.00
      3      131.98   98.94    0.317  0.60( 0.58) 0.96    5080.9   12211.00
      4      144.36  109.28    0.301  0.60( 0.57) 0.96    5744.4   12201.00
      5      152.92  118.07    0.288  0.60( 0.57) 0.96    6190.6   12261.00
      6      152.80  119.67    0.285  0.60( 0.57) 0.96    6244.7   12111.00
      7      152.57  124.06    0.282  0.60( 0.57) 0.96    6439.7   12231.00
      8      151.34  142.21    0.267  0.60( 0.58) 0.96    7103.5   12101.10
      9      132.75  178.46    0.237  0.60( 0.58) 0.97    8330.1   12010.00
     10       82.56  240.87    0.214  0.60( 0.58) 0.97    8476.0   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     152.92    Tc(MIN.) =   118.07
```

```
 EFFECTIVE AREA(ACRES) =    6190.56   AREA-AVERAGED Fm(INCH/HR) =  0.57
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     8476.0
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12340.00 TO NODE  12341.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    678.19  DOWNSTREAM(FEET) =    630.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2827.23   CHANNEL SLOPE =  0.0170
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.278
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      317.33      0.60     0.999     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     152.96
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.43
 AVERAGE FLOW DEPTH(FEET) =   3.39   TRAVEL TIME(MIN.) =  10.63
 Tc(MIN.) =  128.71
 SUBAREA AREA(ACRES) =   317.33       SUBAREA RUNOFF(CFS) =    0.08
 EFFECTIVE AREA(ACRES) =   6507.89     AREA-AVERAGED Fm(INCH/HR) =   0.58
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.96
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     8793.3         PEAK FLOW RATE(CFS) =     152.92
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.39   FLOW VELOCITY(FEET/SEC.) =   4.43
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12341.00 =   52609.50 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      139.89   62.43    0.391  0.60( 0.58) 0.97    2780.3   12300.00
     2      139.33   67.46    0.380  0.60( 0.58) 0.97    3082.6   12330.00
     3      131.98  109.96    0.300  0.60( 0.58) 0.96    5398.2   12211.00
     4      144.36  120.09    0.285  0.60( 0.58) 0.96    6061.7   12201.00
     5      152.92  128.71    0.278  0.60( 0.58) 0.96    6507.9   12261.00
     6      152.80  130.31    0.277  0.60( 0.58) 0.96    6562.0   12111.00
     7      152.57  134.71    0.273  0.60( 0.58) 0.96    6757.1   12231.00
     8      151.34  152.86    0.258  0.60( 0.58) 0.96    7420.8   12101.10
     9      132.75  189.48    0.233  0.60( 0.58) 0.97    8647.5   12010.00
    10       82.56  253.26    0.209  0.60( 0.58) 0.97    8793.3   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     152.92  Tc(MIN.) =  128.71
 AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    6507.89
```



```
****************************************************************************
 FLOW PROCESS FROM NODE  12341.00 TO NODE  12342.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    630.21  DOWNSTREAM(FEET) =    601.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2006.47   CHANNEL SLOPE =  0.0142
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.271
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      124.13      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     152.92
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.15
 AVERAGE FLOW DEPTH(FEET) =   3.51   TRAVEL TIME(MIN.) =   8.07
 Tc(MIN.) =  136.77
 SUBAREA AREA(ACRES) =   124.13       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   6632.02     AREA-AVERAGED Fm(INCH/HR) =   0.58
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.96
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     8917.5         PEAK FLOW RATE(CFS) =     152.92
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.51   FLOW VELOCITY(FEET/SEC.) =   4.15
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12342.00 =   54615.97 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      139.89   70.67    0.373  0.60( 0.58) 0.97    2904.4   12300.00
     2      139.33   75.71    0.361  0.60( 0.58) 0.97    3206.7   12330.00
     3      131.98  118.32    0.288  0.60( 0.58) 0.96    5522.3   12211.00
     4      144.36  128.26    0.278  0.60( 0.58) 0.96    6185.8   12201.00
     5      152.92  136.77    0.271  0.60( 0.58) 0.96    6632.0   12261.00
     6      152.80  138.37    0.270  0.60( 0.58) 0.96    6686.2   12111.00
     7      152.57  142.79    0.266  0.60( 0.58) 0.96    6881.2   12231.00
     8      151.34  160.94    0.252  0.60( 0.58) 0.96    7545.0   12101.10
     9      132.75  197.82    0.229  0.60( 0.58) 0.97    8771.6   12010.00
    10       82.56  262.66    0.206  0.60( 0.58) 0.97    8917.5   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     152.92  Tc(MIN.) =  136.77
 AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    6632.02

****************************************************************************
 FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    601.66  DOWNSTREAM(FEET) =    572.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.49   CHANNEL SLOPE =  0.0156
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.265
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.92      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     152.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.29
  AVERAGE FLOW DEPTH(FEET) =   3.45   TRAVEL TIME(MIN.) =   7.32
  Tc(MIN.) =  144.09
  SUBAREA AREA(ACRES) =    96.92       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   6728.94     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.96
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     9014.4         PEAK FLOW RATE(CFS) =     152.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.45   FLOW VELOCITY(FEET/SEC.) =   4.29
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      139.89   78.15    0.356  0.60( 0.58) 0.97    3001.4   12300.00
      2      139.33   83.20    0.345  0.60( 0.58) 0.97    3303.6   12330.00
      3      131.98  125.91    0.280  0.60( 0.58) 0.96    5619.2   12211.00
      4      144.36  135.70    0.272  0.60( 0.58) 0.96    6282.7   12201.00
      5      152.92  144.09    0.265  0.60( 0.58) 0.96    6728.9   12261.00
      6      152.80  145.70    0.264  0.60( 0.58) 0.96    6783.1   12111.00
      7      152.57  150.11    0.260  0.60( 0.58) 0.96    6978.1   12231.00
      8      151.34  168.29    0.246  0.60( 0.58) 0.96    7641.9   12101.10
      9      132.75  205.40    0.227  0.60( 0.58) 0.97    8868.5   12010.00
     10       82.56  271.21    0.203  0.60( 0.58) 0.97    9014.4   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     152.92  Tc(MIN.) =  144.09
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    6728.94
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     9014.4  TC(MIN.) =    144.09
  EFFECTIVE AREA(ACRES) =   6728.94  AREA-AVERAGED Fm(INCH/HR)=  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.960
  PEAK FLOW RATE(CFS)   =     152.92

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      139.89   78.15    0.356  0.60( 0.58) 0.97    3001.4   12300.00
```



```
      2      139.33   83.20    0.345  0.60( 0.58) 0.97    3303.6   12330.00
      3      131.98  125.91    0.280  0.60( 0.58) 0.96    5619.2   12211.00
      4      144.36  135.70    0.272  0.60( 0.58) 0.96    6282.7   12201.00
      5      152.92  144.09    0.265  0.60( 0.58) 0.96    6728.9   12261.00
      6      152.80  145.70    0.264  0.60( 0.58) 0.96    6783.1   12111.00
      7      152.57  150.11    0.260  0.60( 0.58) 0.96    6978.1   12231.00
      8      151.34  168.29    0.246  0.60( 0.58) 0.96    7641.9   12101.10
      9      132.75  205.40    0.227  0.60( 0.58) 0.97    8868.5   12010.00
     10       82.56  271.21    0.203  0.60( 0.58) 0.97    9014.4   12000.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




------------------------------------------------------------------------------
  FILE NAME: S24.DAT
  TIME/DATE OF STUDY: 14:37 04/03/2013
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.756
   2)   10.00;  1.171
   3)   15.00;  0.905
   4)   20.00;  0.751
   5)   25.00;  0.652
   6)   30.00;  0.579
   7)   40.00;  0.498
   8)   50.00;  0.441
   9)   60.00;  0.396
  10)   90.00;  0.330
  11)  120.00;  0.285
  12)  180.00;  0.236
  13)  360.00;  0.170
  14) 1440.00;  0.074
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
******************************************************************************
  FLOW PROCESS FROM NODE  12400.00 TO NODE  12401.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   981.52
  ELEVATION DATA: UPSTREAM(FEET) =   2579.17  DOWNSTREAM(FEET) =   2249.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.811
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.968
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        8.82      0.60     1.000     0   13.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.92
  TOTAL AREA(ACRES) =      8.82   PEAK FLOW RATE(CFS) =      2.92

******************************************************************************
  FLOW PROCESS FROM NODE  12401.00 TO NODE  12402.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2249.14  DOWNSTREAM(FEET) =   2103.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   975.11   CHANNEL SLOPE =  0.1490
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.838
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       46.29      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.82
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   17.19
  SUBAREA AREA(ACRES) =    46.29       SUBAREA RUNOFF(CFS) =    9.91
  EFFECTIVE AREA(ACRES) =     55.11     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.1         PEAK FLOW RATE(CFS) =      11.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   5.26
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12402.00 =    1956.63 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  12402.00 TO NODE  12403.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2103.89  DOWNSTREAM(FEET) =   1771.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.50   CHANNEL SLOPE =  0.1768
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.702
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.97      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.90
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   5.31
  Tc(MIN.) =   22.50
  SUBAREA AREA(ACRES) =    54.97       SUBAREA RUNOFF(CFS) =    5.03
  EFFECTIVE AREA(ACRES) =    110.08     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =      11.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) =   5.62
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12403.00 =    3837.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12403.00 TO NODE  12404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1771.34  DOWNSTREAM(FEET) =   1462.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2888.53   CHANNEL SLOPE =  0.1070
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.556
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.02      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.66
  AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =  10.33
  Tc(MIN.) =   32.82
  SUBAREA AREA(ACRES) =   123.02       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    233.10     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      233.1         PEAK FLOW RATE(CFS) =      11.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.92   FLOW VELOCITY(FEET/SEC.) =   4.66
```



```
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12404.00 =    6725.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12404.00 TO NODE  12405.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1462.30  DOWNSTREAM(FEET) =   1308.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.25   CHANNEL SLOPE =  0.0800
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.495
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      241.71      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.16
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   7.71
  Tc(MIN.) =   40.53
  SUBAREA AREA(ACRES) =   241.71       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    474.81     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      474.8         PEAK FLOW RATE(CFS) =      11.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   4.16
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12405.00 =    8650.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12405.00 TO NODE  12406.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.28  DOWNSTREAM(FEET) =   1154.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1923.41   CHANNEL SLOPE =  0.0802
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.451
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.96      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.16
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   7.70
  Tc(MIN.) =   48.23
  SUBAREA AREA(ACRES) =   238.96       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    713.77     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      713.8         PEAK FLOW RATE(CFS) =      11.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   4.16
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12406.00 =   10574.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1154.02  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1607.69   CHANNEL SLOPE =  0.0503
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.415
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.02      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.52
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   7.62
  Tc(MIN.) =   55.85
  SUBAREA AREA(ACRES) =    58.02       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    771.79     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      771.8         PEAK FLOW RATE(CFS) =      11.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   3.52
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   55.85
  RAINFALL INTENSITY(INCH/HR) =   0.41
```



```
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     771.79
  TOTAL STREAM AREA(ACRES) =     771.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      11.80

****************************************************************************
  FLOW PROCESS FROM NODE  12410.00 TO NODE  12411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   966.15
  ELEVATION DATA: UPSTREAM(FEET) =   2215.42  DOWNSTREAM(FEET) =   1909.05

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.886
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.964
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.99      0.60     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.95
  TOTAL AREA(ACRES) =      8.99   PEAK FLOW RATE(CFS) =      2.95

****************************************************************************
  FLOW PROCESS FROM NODE  12411.00 TO NODE  12412.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1909.05  DOWNSTREAM(FEET) =   1794.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.59   CHANNEL SLOPE =  0.1215
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.816
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.56      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.93
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   4.00
  Tc(MIN.) =   17.89
  SUBAREA AREA(ACRES) =    18.56       SUBAREA RUNOFF(CFS) =    3.61
  EFFECTIVE AREA(ACRES) =     27.55     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.5         PEAK FLOW RATE(CFS) =       5.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   4.02
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12412.00 =    1909.74 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12412.00 TO NODE  12413.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.38  DOWNSTREAM(FEET) =   1649.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.82   CHANNEL SLOPE =  0.1560
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.726
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.09      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.59
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   21.26
  SUBAREA AREA(ACRES) =    16.09       SUBAREA RUNOFF(CFS) =    1.83
  EFFECTIVE AREA(ACRES) =     43.64     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       43.6         PEAK FLOW RATE(CFS) =       5.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   4.42
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12413.00 =    2836.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12413.00 TO NODE  12414.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1649.76  DOWNSTREAM(FEET) =   1365.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1906.16   CHANNEL SLOPE =  0.1490
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.601
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.14      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.40
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   7.22
  Tc(MIN.) =   28.48
  SUBAREA AREA(ACRES) =    75.14       SUBAREA RUNOFF(CFS) =    0.09
  EFFECTIVE AREA(ACRES) =    118.78     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.8         PEAK FLOW RATE(CFS) =       5.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   4.31
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12414.00 =    4742.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1365.78  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3038.90   CHANNEL SLOPE =  0.0963
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.485
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.43      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.68
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =  13.78
  Tc(MIN.) =   42.26
  SUBAREA AREA(ACRES) =   151.43       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    270.21     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      270.2         PEAK FLOW RATE(CFS) =       5.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   3.68
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12420.00 =    7781.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   42.26
  RAINFALL INTENSITY(INCH/HR) =   0.49
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     270.21
  TOTAL STREAM AREA(ACRES) =     270.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.36

  ** CONFLUENCE DATA **
```

```
 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1       11.80   55.85    0.415  0.60( 0.60) 1.00     771.8   12400.00
    2        5.36   42.26    0.485  0.60( 0.60) 1.00     270.2   12410.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1       15.80   42.26    0.485  0.60( 0.60) 1.00     854.1   12410.00
    2       16.38   55.85    0.415  0.60( 0.60) 1.00    1042.0   12400.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.38    Tc(MIN.) =    55.85
  EFFECTIVE AREA(ACRES) =    1042.00   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1042.0
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12420.00 TO NODE  12421.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1073.11  DOWNSTREAM(FEET) =   1005.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2235.12   CHANNEL SLOPE =  0.0303
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.379
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      218.57      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.15
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =  11.84
  Tc(MIN.) =   67.69
  SUBAREA AREA(ACRES) =   218.57       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1260.57     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1260.6         PEAK FLOW RATE(CFS) =      16.38
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   3.15
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12421.00 =   14417.13 FEET.

  ** PEAK FLOW RATE TABLE **
 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1       15.80   54.21    0.422  0.60( 0.60) 1.00    1072.7   12410.00
    2       16.38   67.69    0.379  0.60( 0.60) 1.00    1260.6   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      16.38  Tc(MIN.) =   67.69
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1260.57

****************************************************************************
  FLOW PROCESS FROM NODE  12421.00 TO NODE  12422.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.32  DOWNSTREAM(FEET) =    879.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.31   CHANNEL SLOPE =  0.0451
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.351
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      241.55      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.65
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =  12.80
  Tc(MIN.) =   80.49
  SUBAREA AREA(ACRES) =   241.55       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1502.12     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1502.1         PEAK FLOW RATE(CFS) =      16.38
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   3.65
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12422.00 =   17217.44 FEET.

  ** PEAK FLOW RATE TABLE **
 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1       15.80   67.14    0.380  0.60( 0.60) 1.00    1314.2   12410.00
    2       16.38   80.49    0.351  0.60( 0.60) 1.00    1502.1   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      16.38  Tc(MIN.) =   80.49
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1502.12

****************************************************************************
  FLOW PROCESS FROM NODE  12422.00 TO NODE  12423.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    879.13  DOWNSTREAM(FEET) =    815.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.90   CHANNEL SLOPE =  0.0333
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.330
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.63      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.26
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   9.81
  Tc(MIN.) =   90.30
  SUBAREA AREA(ACRES) =   151.63       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1653.75     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1653.8         PEAK FLOW RATE(CFS) =      16.38
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.29   FLOW VELOCITY(FEET/SEC.) =   3.26
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12423.00 =   19136.34 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       15.80   77.04    0.359  0.60( 0.60) 1.00    1465.9   12410.00
      2       16.38   90.30    0.330  0.60( 0.60) 1.00    1653.8   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      16.38  Tc(MIN.) =   90.30
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1653.75

**************************************************************************
  FLOW PROCESS FROM NODE  12423.00 TO NODE  12424.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    815.17  DOWNSTREAM(FEET) =    696.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2870.82   CHANNEL SLOPE =  0.0413
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.309
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      122.40      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
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  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.55
  AVERAGE FLOW DEPTH(FEET) =   1.24   TRAVEL TIME(MIN.) =  13.49
  Tc(MIN.) =  103.79
  SUBAREA AREA(ACRES) =   122.40       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1776.15     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1776.2         PEAK FLOW RATE(CFS) =      16.38
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.24   FLOW VELOCITY(FEET/SEC.) =   3.55
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12424.00 =   22007.16 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       15.80   90.69    0.329  0.60( 0.60) 1.00    1588.3   12410.00
      2       16.38  103.79    0.309  0.60( 0.60) 1.00    1776.2   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      16.38  Tc(MIN.) =  103.79
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1776.15

**************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    696.54  DOWNSTREAM(FEET) =    572.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3680.45   CHANNEL SLOPE =  0.0338
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.283
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.54      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.27
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =  18.76
  Tc(MIN.) =  122.56
  SUBAREA AREA(ACRES) =    96.54       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1872.69     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1872.7         PEAK FLOW RATE(CFS) =      16.38
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.29   FLOW VELOCITY(FEET/SEC.) =   3.27
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12425.00 =   25687.61 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       15.80  109.51    0.301  0.60( 0.60) 1.00    1684.8   12410.00
      2       16.38  122.56    0.283  0.60( 0.60) 1.00    1872.7   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      16.38  Tc(MIN.) =  122.56
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1872.69
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1872.7  TC(MIN.) =    122.56
  EFFECTIVE AREA(ACRES) =   1872.69  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      16.38

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       15.80  109.51    0.301  0.60( 0.60) 1.00    1684.8   12410.00
      2       16.38  122.56    0.283  0.60( 0.60) 1.00    1872.7   12400.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S25.DAT
  TIME/DATE OF STUDY: 14:37 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.882
   2)   10.00;  1.255
   3)   15.00;  0.954
   4)   20.00;  0.779
   5)   25.00;  0.670
   6)   30.00;  0.594
   7)   40.00;  0.512
   8)   50.00;  0.455
   9)   60.00;  0.415
  10)   90.00;  0.352
  11)  120.00;  0.308
  12)  180.00;  0.259
  13)  360.00;  0.192
  14) 1440.00;  0.085
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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**************************************************************************
  FLOW PROCESS FROM NODE  12500.00 TO NODE  12501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   927.04
  ELEVATION DATA: UPSTREAM(FEET) =   1638.22  DOWNSTREAM(FEET) =   1356.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.770
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.028
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        8.89      0.60     1.000     0   13.77
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.43
  TOTAL AREA(ACRES) =      8.89   PEAK FLOW RATE(CFS) =      3.43

**************************************************************************
  FLOW PROCESS FROM NODE  12501.00 TO NODE  12502.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1356.00  DOWNSTREAM(FEET) =   1203.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1004.73   CHANNEL SLOPE =  0.1519
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.870
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       24.30      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.59
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   3.65
  Tc(MIN.) =   17.42
  SUBAREA AREA(ACRES) =    24.30       SUBAREA RUNOFF(CFS) =    5.90
  EFFECTIVE AREA(ACRES) =     33.19     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.2         PEAK FLOW RATE(CFS) =       8.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   4.84
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12502.00 =    1931.77 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12502.00 TO NODE  12503.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1203.37  DOWNSTREAM(FEET) =    987.23
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.62   CHANNEL SLOPE =  0.1147
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.694
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       90.42      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.85
 AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   6.48
 Tc(MIN.) =   23.90
 SUBAREA AREA(ACRES) =    90.42       SUBAREA RUNOFF(CFS) =    7.70
 EFFECTIVE AREA(ACRES) =    123.61     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      123.6         PEAK FLOW RATE(CFS) =      10.52

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   4.67
 LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12503.00 =    3816.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12503.00 TO NODE  12504.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    987.23  DOWNSTREAM(FEET) =    870.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1478.57   CHANNEL SLOPE =  0.0792
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.594
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       84.07      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.04
 AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   6.11
 Tc(MIN.) =   30.00
 SUBAREA AREA(ACRES) =    84.07       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    207.68     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      207.7         PEAK FLOW RATE(CFS) =      10.52
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   4.02
 LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12504.00 =    5294.96 FEET.
```



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****************************************************************************
 FLOW PROCESS FROM NODE  12504.00 TO NODE  12505.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    870.07  DOWNSTREAM(FEET) =    729.02
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1915.52   CHANNEL SLOPE =  0.0736
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.528
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       79.84      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.52
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.94
 AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   8.10
 Tc(MIN.) =   38.10
 SUBAREA AREA(ACRES) =    79.84       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    287.52     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      287.5         PEAK FLOW RATE(CFS) =      10.52
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.94   FLOW VELOCITY(FEET/SEC.) =   3.94
 LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12505.00 =    7210.48 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    729.02  DOWNSTREAM(FEET) =    549.92
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2961.35   CHANNEL SLOPE =  0.0605
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.449
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       78.77      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.52
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.66
 AVERAGE FLOW DEPTH(FEET) =   0.98   TRAVEL TIME(MIN.) =  13.50
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```
  Tc(MIN.) =   51.60
  SUBAREA AREA(ACRES) =    78.77       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    366.29     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      366.3         PEAK FLOW RATE(CFS) =      10.52
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =   3.66
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12520.00 =   10171.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S23.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      139.89   78.15  0.60( 0.58) 0.97    3001.4   12300.00
      2      139.33   83.20  0.60( 0.58) 0.97    3303.6   12330.00
      3      131.98  125.91  0.60( 0.58) 0.96    5619.2   12211.00
      4      144.36  135.70  0.60( 0.58) 0.96    6282.7   12201.00
      5      152.92  144.09  0.60( 0.58) 0.96    6728.9   12261.00
      6      152.80  145.70  0.60( 0.58) 0.96    6783.1   12111.00
      7      152.57  150.11  0.60( 0.58) 0.96    6978.1   12231.00
      8      151.34  168.29  0.60( 0.58) 0.96    7641.9   12101.10
      9      132.75  205.40  0.60( 0.58) 0.97    8868.5   12010.00
     10       82.56  271.21  0.60( 0.58) 0.97    9014.4   12000.00
    TOTAL AREA(ACRES) =     9014.4

****************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S24.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       15.80  109.51  0.60( 0.60) 1.00    1684.8   12410.00
      2       16.38  122.56  0.60( 0.60) 1.00    1872.7   12400.00
    TOTAL AREA(ACRES) =     1872.7

****************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================
```



```
  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       15.80  109.51  0.60( 0.60) 1.00    1684.8   12410.00
      2       16.38  122.56  0.60( 0.60) 1.00    1872.7   12400.00
    TOTAL AREA(ACRES) =     1872.7

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       15.80  109.51    0.324  0.60( 0.60) 1.00    1684.8   12410.00
      2       16.38  122.56    0.306  0.60( 0.60) 1.00    1872.7   12400.00
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12425.00 =   25687.61 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      139.89   78.15    0.377  0.60( 0.58) 0.97    3001.4   12300.00
      2      139.33   83.20    0.367  0.60( 0.58) 0.97    3303.6   12330.00
      3      131.98  125.91    0.304  0.60( 0.58) 0.96    5619.2   12211.00
      4      144.36  135.70    0.295  0.60( 0.58) 0.96    6282.7   12201.00
      5      152.92  144.09    0.289  0.60( 0.58) 0.96    6728.9   12261.00
      6      152.80  145.70    0.287  0.60( 0.58) 0.96    6783.1   12111.00
      7      152.57  150.11    0.284  0.60( 0.58) 0.96    6978.1   12231.00
      8      151.34  168.29    0.268  0.60( 0.58) 0.96    7641.9   12101.10
      9      132.75  205.40    0.249  0.60( 0.58) 0.97    8868.5   12010.00
     10       82.56  271.21    0.225  0.60( 0.58) 0.97    9014.4   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      153.03   78.15    0.377  0.60( 0.59) 0.98    4203.7   12300.00
      2      152.93   83.20    0.367  0.60( 0.59) 0.98    4583.7   12330.00
      3      150.61  109.51    0.324  0.60( 0.59) 0.98    6414.7   12410.00
      4      148.94  122.56    0.306  0.60( 0.58) 0.97    7309.9   12400.00
      5      148.21  125.91    0.304  0.60( 0.58) 0.97    7491.9   12211.00
      6      160.16  135.70    0.295  0.60( 0.58) 0.97    8155.4   12201.00
      7      168.35  144.09    0.289  0.60( 0.58) 0.97    8601.6   12261.00
      8      168.16  145.70    0.287  0.60( 0.58) 0.97    8655.8   12111.00
      9      167.73  150.11    0.284  0.60( 0.58) 0.97    8850.8   12231.00
     10      165.70  168.29    0.268  0.60( 0.58) 0.97    9514.6   12101.10
     11      146.08  205.40    0.249  0.60( 0.58) 0.98   10741.2   12010.00
     12       94.58  271.21    0.225  0.60( 0.59) 0.98   10887.1   12000.00
    TOTAL AREA(ACRES) =     10887.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      168.35  Tc(MIN.) =  144.089
  EFFECTIVE AREA(ACRES) =   8601.63  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    10887.1
```

```
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12425.00 TO NODE  12520.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    572.29  DOWNSTREAM(FEET) =    549.92
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1724.25   CHANNEL SLOPE =  0.0130
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.283
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      117.96      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     168.35
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.10
 AVERAGE FLOW DEPTH(FEET) =   3.70   TRAVEL TIME(MIN.) =   7.00
 Tc(MIN.) =  151.09
 SUBAREA AREA(ACRES) =   117.96       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   8719.59     AREA-AVERAGED Fm(INCH/HR) =   0.58
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =    11005.0         PEAK FLOW RATE(CFS) =     168.35
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.70   FLOW VELOCITY(FEET/SEC.) =   4.10
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12520.00 =   58224.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      153.03   85.32    0.362  0.60( 0.59) 0.98    4321.6   12300.00
     2      152.93   90.38    0.352  0.60( 0.59) 0.98    4701.7   12330.00
     3      150.61  116.70    0.313  0.60( 0.59) 0.98    6532.6   12410.00
     4      148.94  129.77    0.300  0.60( 0.58) 0.97    7427.9   12400.00
     5      148.21  133.15    0.298  0.60( 0.58) 0.97    7609.9   12211.00
     6      160.16  142.79    0.290  0.60( 0.58) 0.97    8273.4   12201.00
     7      168.35  151.09    0.283  0.60( 0.58) 0.97    8719.6   12261.00
     8      168.16  152.70    0.281  0.60( 0.58) 0.97    8773.7   12111.00
     9      167.73  157.13    0.278  0.60( 0.58) 0.97    8968.8   12231.00
    10      165.70  175.31    0.263  0.60( 0.58) 0.97    9632.5   12101.10
    11      146.08  212.66    0.247  0.60( 0.59) 0.98   10859.2   12010.00
    12       94.58  279.29    0.222  0.60( 0.59) 0.98   11005.0   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     168.35  Tc(MIN.) =  151.09
 AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =    8719.59

****************************************************************************
```



```
 FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      153.03   85.32    0.362  0.60( 0.59) 0.98    4321.6   12300.00
     2      152.93   90.38    0.352  0.60( 0.59) 0.98    4701.7   12330.00
     3      150.61  116.70    0.313  0.60( 0.59) 0.98    6532.6   12410.00
     4      148.94  129.77    0.300  0.60( 0.58) 0.97    7427.9   12400.00
     5      148.21  133.15    0.298  0.60( 0.58) 0.97    7609.9   12211.00
     6      160.16  142.79    0.290  0.60( 0.58) 0.97    8273.4   12201.00
     7      168.35  151.09    0.283  0.60( 0.58) 0.97    8719.6   12261.00
     8      168.16  152.70    0.281  0.60( 0.58) 0.97    8773.7   12111.00
     9      167.73  157.13    0.278  0.60( 0.58) 0.97    8968.8   12231.00
    10      165.70  175.31    0.263  0.60( 0.58) 0.97    9632.5   12101.10
    11      146.08  212.66    0.247  0.60( 0.59) 0.98   10859.2   12010.00
    12       94.58  279.29    0.222  0.60( 0.59) 0.98   11005.0   12000.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12520.00 =   58224.71 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       10.52   51.60    0.449  0.60( 0.60) 1.00     366.3   12500.00
 LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12520.00 =   10171.83 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      125.24   51.60    0.449  0.60( 0.59) 0.98    2979.9   12500.00
     2      161.52   85.32    0.362  0.60( 0.59) 0.98    4687.9   12300.00
     3      161.17   90.38    0.352  0.60( 0.59) 0.98    5067.9   12330.00
     4      157.95  116.70    0.313  0.60( 0.59) 0.98    6898.9   12410.00
     5      155.98  129.77    0.300  0.60( 0.58) 0.97    7794.2   12400.00
     6      155.19  133.15    0.298  0.60( 0.58) 0.97    7976.2   12211.00
     7      166.94  142.79    0.290  0.60( 0.58) 0.97    8639.7   12201.00
     8      174.98  151.09    0.283  0.60( 0.58) 0.97    9085.9   12261.00
     9      174.75  152.70    0.281  0.60( 0.58) 0.97    9140.0   12111.00
    10      174.24  157.13    0.278  0.60( 0.58) 0.97    9335.1   12231.00
    11      171.86  175.31    0.263  0.60( 0.58) 0.97    9998.8   12101.10
    12      151.86  212.66    0.247  0.60( 0.59) 0.98   11225.5   12010.00
    13       99.78  279.29    0.222  0.60( 0.59) 0.98   11371.3   12000.00
   TOTAL AREA(ACRES) =     11371.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      174.98  Tc(MIN.) =  151.090
 EFFECTIVE AREA(ACRES) =   9085.88  AREA-AVERAGED Fm(INCH/HR) =  0.58
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    11371.3
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12520.00 =   58224.71 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12520.00 TO NODE  12521.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

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==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    549.92  DOWNSTREAM(FEET) =    525.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1934.41   CHANNEL SLOPE =  0.0127
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.276
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.91      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     174.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.10
  AVERAGE FLOW DEPTH(FEET) =   3.77   TRAVEL TIME(MIN.) =   7.86
  Tc(MIN.) =  158.95
  SUBAREA AREA(ACRES) =    85.91       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   9171.79     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    11457.2         PEAK FLOW RATE(CFS) =     174.98
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.77   FLOW VELOCITY(FEET/SEC.) =   4.10
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12521.00 =   60159.12 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      125.24   60.13    0.415  0.60( 0.59) 0.98    3065.9   12500.00
      2      161.52   93.33    0.348  0.60( 0.59) 0.98    4773.8   12300.00
      3      161.17   98.40    0.340  0.60( 0.59) 0.98    5153.9   12330.00
      4      157.95  124.76    0.304  0.60( 0.59) 0.98    6984.8   12410.00
      5      155.98  137.85    0.294  0.60( 0.58) 0.97    7880.1   12400.00
      6      155.19  141.25    0.291  0.60( 0.58) 0.97    8062.1   12211.00
      7      166.94  150.73    0.283  0.60( 0.58) 0.97    8725.6   12201.00
      8      174.98  158.95    0.276  0.60( 0.58) 0.97    9171.8   12261.00
      9      174.75  160.55    0.275  0.60( 0.58) 0.97    9225.9   12111.00
     10      174.24  164.99    0.271  0.60( 0.58) 0.97    9421.0   12231.00
     11      171.86  183.20    0.258  0.60( 0.58) 0.97   10084.7   12101.10
     12      151.86  220.79    0.244  0.60( 0.59) 0.98   11311.4   12010.00
     13       99.78  288.34    0.218  0.60( 0.59) 0.98   11457.2   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     174.98  Tc(MIN.) =  158.95
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =    9171.79

**************************************************************************
  FLOW PROCESS FROM NODE  12521.00 TO NODE  12522.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    525.43  DOWNSTREAM(FEET) =    490.87
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3335.01   CHANNEL SLOPE =  0.0104
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.264
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      539.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     174.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.81
  AVERAGE FLOW DEPTH(FEET) =   3.91   TRAVEL TIME(MIN.) =  14.58
  Tc(MIN.) =  173.53
  SUBAREA AREA(ACRES) =   539.82       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   9711.61     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    11997.0         PEAK FLOW RATE(CFS) =     174.98
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.91   FLOW VELOCITY(FEET/SEC.) =   3.81
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12522.00 =   63494.13 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      125.24   75.99    0.382  0.60( 0.59) 0.99    3605.7   12500.00
      2      161.52  108.21    0.326  0.60( 0.59) 0.99    5313.6   12300.00
      3      161.17  113.30    0.318  0.60( 0.59) 0.98    5693.7   12330.00
      4      157.95  139.73    0.292  0.60( 0.59) 0.98    7524.7   12410.00
      5      155.98  152.88    0.281  0.60( 0.59) 0.98    8419.9   12400.00
      6      155.19  156.29    0.278  0.60( 0.59) 0.98    8601.9   12211.00
      7      166.94  165.48    0.271  0.60( 0.58) 0.97    9265.4   12201.00
      8      174.98  173.53    0.264  0.60( 0.58) 0.97    9711.6   12261.00
      9      174.75  175.15    0.263  0.60( 0.58) 0.97    9765.8   12111.00
     10      174.24  179.62    0.259  0.60( 0.58) 0.97    9960.8   12231.00
     11      171.86  197.87    0.252  0.60( 0.58) 0.97   10624.5   12101.10
     12      151.86  235.91    0.238  0.60( 0.59) 0.98   11851.2   12010.00
     13       99.78  305.14    0.212  0.60( 0.59) 0.98   11997.0   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     174.98  Tc(MIN.) =  173.53
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =    9711.61

**************************************************************************
  FLOW PROCESS FROM NODE  12522.00 TO NODE  12523.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.87  DOWNSTREAM(FEET) =    467.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1961.26   CHANNEL SLOPE =  0.0118
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.258
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	321.58	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 174.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.00
AVERAGE FLOW DEPTH(FEET) = 3.82 TRAVEL TIME(MIN.) = 8.17
Tc(MIN.) = 181.70
SUBAREA AREA(ACRES) = 321.58 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 10033.19 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 12318.6 PEAK FLOW RATE(CFS) = 174.98
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.82 FLOW VELOCITY(FEET/SEC.) = 4.00
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12523.00 = 65455.39 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	84.87	0.363	0.60(0.59)	0.99	3927.3	12500.00
2	161.52	116.53	0.314	0.60(0.59)	0.99	5635.2	12300.00
3	161.17	121.65	0.307	0.60(0.59)	0.99	6015.3	12330.00
4	157.95	148.10	0.285	0.60(0.59)	0.98	7846.2	12410.00
5	155.98	161.29	0.274	0.60(0.59)	0.98	8741.5	12400.00
6	155.19	164.70	0.271	0.60(0.59)	0.98	8923.5	12211.00
7	166.94	173.73	0.264	0.60(0.58)	0.97	9587.0	12201.00
8	174.98	181.70	0.258	0.60(0.58)	0.97	10033.2	12261.00
9	174.75	183.30	0.258	0.60(0.58)	0.97	10087.3	12111.00
10	174.24	187.79	0.256	0.60(0.58)	0.97	10282.4	12231.00
11	171.86	206.06	0.249	0.60(0.59)	0.98	10946.1	12101.10
12	151.86	244.37	0.235	0.60(0.59)	0.98	12172.8	12010.00
13	99.78	314.54	0.209	0.60(0.59)	0.98	12318.6	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 174.98 Tc(MIN.) = 181.70
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 10033.19

****
FLOW PROCESS FROM NODE 12523.00 TO NODE 12524.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 467.63 DOWNSTREAM(FEET) = 436.35
CHANNEL LENGTH THRU SUBAREA(FEET) = 2841.85 CHANNEL SLOPE = 0.0110
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.254

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	298.62	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 174.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.89
AVERAGE FLOW DEPTH(FEET) = 3.87 TRAVEL TIME(MIN.) = 12.17
Tc(MIN.) = 193.87
SUBAREA AREA(ACRES) = 298.62 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 10331.81 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 12617.2 PEAK FLOW RATE(CFS) = 174.98
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.87 FLOW VELOCITY(FEET/SEC.) = 3.89
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12524.00 = 68297.24 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	98.09	0.341	0.60(0.59)	0.99	4225.9	12500.00
2	161.52	128.95	0.301	0.60(0.59)	0.99	5933.8	12300.00
3	161.17	134.05	0.297	0.60(0.59)	0.99	6313.9	12330.00
4	157.95	160.59	0.275	0.60(0.59)	0.98	8144.9	12410.00
5	155.98	173.79	0.264	0.60(0.59)	0.98	9040.1	12400.00
6	155.19	177.22	0.261	0.60(0.59)	0.98	9222.1	12211.00
7	166.94	186.04	0.257	0.60(0.59)	0.98	9885.6	12201.00
8	174.98	193.87	0.254	0.60(0.58)	0.97	10331.8	12261.00
9	174.75	195.45	0.253	0.60(0.58)	0.97	10386.0	12111.00
10	174.24	199.96	0.251	0.60(0.58)	0.97	10581.0	12231.00
11	171.86	218.26	0.245	0.60(0.59)	0.98	11244.7	12101.10
12	151.86	256.95	0.230	0.60(0.59)	0.98	12471.4	12010.00
13	99.78	328.52	0.203	0.60(0.59)	0.98	12617.2	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 174.98 Tc(MIN.) = 193.87
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 10331.81

****
FLOW PROCESS FROM NODE 12524.00 TO NODE 12525.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 436.35 DOWNSTREAM(FEET) = 415.23
CHANNEL LENGTH THRU SUBAREA(FEET) = 2812.14 CHANNEL SLOPE = 0.0075
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.248
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

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     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED                -      251.20      0.60     0.997     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     175.06
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.38
AVERAGE FLOW DEPTH(FEET) =   4.16   TRAVEL TIME(MIN.) =  13.87
Tc(MIN.) =  207.73
SUBAREA AREA(ACRES) =   251.20       SUBAREA RUNOFF(CFS) =    0.17
EFFECTIVE AREA(ACRES) =  10583.01     AREA-AVERAGED Fm(INCH/HR) =   0.58
AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) =    12868.4         PEAK FLOW RATE(CFS) =     174.98
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  4.16   FLOW VELOCITY(FEET/SEC.) =   3.38
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12525.00 =   71109.38 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      125.24  113.17    0.318  0.60( 0.59) 0.99    4477.1   12500.00
    2      161.52  143.10    0.289  0.60( 0.59) 0.99    6185.0   12300.00
    3      161.17  148.22    0.285  0.60( 0.59) 0.99    6565.1   12330.00
    4      157.95  174.83    0.263  0.60( 0.59) 0.98    8396.1   12410.00
    5      155.98  188.06    0.256  0.60( 0.59) 0.98    9291.3   12400.00
    6      155.19  191.55    0.255  0.60( 0.59) 0.98    9473.3   12211.00
    7      166.94  200.08    0.251  0.60( 0.59) 0.98   10136.8   12201.00
    8      174.98  207.73    0.248  0.60( 0.58) 0.97   10583.0   12261.00
    9      174.75  209.34    0.248  0.60( 0.58) 0.97   10637.2   12111.00
   10      174.24  213.87    0.246  0.60( 0.58) 0.98   10832.2   12231.00
   11      171.86  232.22    0.239  0.60( 0.59) 0.98   11495.9   12101.10
   12      151.86  271.33    0.225  0.60( 0.59) 0.98   12722.6   12010.00
   13       99.78  344.49    0.198  0.60( 0.59) 0.98   12868.4   12000.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     174.98  Tc(MIN.) =  207.73
AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   10583.01

****************************************************************************
 FLOW PROCESS FROM NODE  12525.00 TO NODE  12526.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    415.23  DOWNSTREAM(FEET) =    380.28
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2934.09   CHANNEL SLOPE =  0.0119
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.244
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      247.71      0.60     0.987     -
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 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.987
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     175.33
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.01
 AVERAGE FLOW DEPTH(FEET) =   3.82   TRAVEL TIME(MIN.) =  12.19
 Tc(MIN.) =  219.93
 SUBAREA AREA(ACRES) =   247.71       SUBAREA RUNOFF(CFS) =    0.71
 EFFECTIVE AREA(ACRES) =  10830.72     AREA-AVERAGED Fm(INCH/HR) =   0.58
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =    13116.2         PEAK FLOW RATE(CFS) =     174.98
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.81   FLOW VELOCITY(FEET/SEC.) =   4.01
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12526.00 =   74043.48 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      125.24  126.40    0.303  0.60( 0.59) 0.99    4724.8   12500.00
     2      161.52  155.52    0.279  0.60( 0.59) 0.99    6432.8   12300.00
     3      161.17  160.67    0.275  0.60( 0.59) 0.99    6812.8   12330.00
     4      157.95  187.33    0.256  0.60( 0.59) 0.98    8643.8   12410.00
     5      155.98  200.61    0.251  0.60( 0.59) 0.98    9539.0   12400.00
     6      155.19  204.11    0.250  0.60( 0.59) 0.98    9721.0   12211.00
     7      166.94  212.41    0.247  0.60( 0.59) 0.98   10384.5   12201.00
     8      174.98  219.93    0.244  0.60( 0.58) 0.97   10830.7   12261.00
     9      174.75  221.51    0.243  0.60( 0.58) 0.98   10884.9   12111.00
    10      174.24  226.07    0.242  0.60( 0.59) 0.98   11079.9   12231.00
    11      171.86  244.45    0.235  0.60( 0.59) 0.98   11743.7   12101.10
    12      151.86  283.96    0.220  0.60( 0.59) 0.98   12970.3   12010.00
    13       99.78  358.51    0.192  0.60( 0.59) 0.98   13116.2   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     174.98  Tc(MIN.) =  219.93
 AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   10830.72

****************************************************************************
 FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    380.28  DOWNSTREAM(FEET) =    347.47
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3113.51   CHANNEL SLOPE =  0.0105
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.239
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      120.94      0.60     0.974     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.974
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 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     175.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.84
 AVERAGE FLOW DEPTH(FEET) =   3.90   TRAVEL TIME(MIN.) =  13.53
 Tc(MIN.) =  233.46
 SUBAREA AREA(ACRES) =   120.94       SUBAREA RUNOFF(CFS) =    0.68
 EFFECTIVE AREA(ACRES) =  10951.67     AREA-AVERAGED Fm(INCH/HR) =   0.58
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =    13237.1         PEAK FLOW RATE(CFS) =     174.98
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.90   FLOW VELOCITY(FEET/SEC.) =   3.83
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12527.00 =   77156.98 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      125.24  141.11    0.291  0.60( 0.59) 0.99    4845.7   12500.00
     2      161.52  169.33    0.268  0.60( 0.59) 0.99    6553.7   12300.00
     3      161.17  174.49    0.263  0.60( 0.59) 0.99    6933.7   12330.00
     4      157.95  201.22    0.251  0.60( 0.59) 0.98    8764.7   12410.00
     5      155.98  214.55    0.246  0.60( 0.59) 0.98    9660.0   12400.00
     6      155.19  218.06    0.245  0.60( 0.59) 0.98    9842.0   12211.00
     7      166.94  226.09    0.242  0.60( 0.59) 0.98   10505.5   12201.00
     8      174.98  233.46    0.239  0.60( 0.58) 0.97   10951.7   12261.00
     9      174.75  235.04    0.238  0.60( 0.58) 0.98   11005.8   12111.00
    10      174.24  239.60    0.237  0.60( 0.59) 0.98   11200.8   12231.00
    11      171.86  258.05    0.230  0.60( 0.59) 0.98   11864.6   12101.10
    12      151.86  297.99    0.215  0.60( 0.59) 0.98   13091.2   12010.00
    13       99.78  374.08    0.190  0.60( 0.59) 0.98   13237.1   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     174.98  Tc(MIN.) =  233.46
 AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   10951.67
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    13237.1  TC(MIN.) =    233.46
 EFFECTIVE AREA(ACRES) =  10951.67  AREA-AVERAGED Fm(INCH/HR)=  0.58
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.975
 PEAK FLOW RATE(CFS)   =     174.98

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      125.24  141.11    0.291  0.60( 0.59) 0.99    4845.7   12500.00
     2      161.52  169.33    0.268  0.60( 0.59) 0.99    6553.7   12300.00
     3      161.17  174.49    0.263  0.60( 0.59) 0.99    6933.7   12330.00
     4      157.95  201.22    0.251  0.60( 0.59) 0.98    8764.7   12410.00
     5      155.98  214.55    0.246  0.60( 0.59) 0.98    9660.0   12400.00
     6      155.19  218.06    0.245  0.60( 0.59) 0.98    9842.0   12211.00
     7      166.94  226.09    0.242  0.60( 0.59) 0.98   10505.5   12201.00
     8      174.98  233.46    0.239  0.60( 0.58) 0.97   10951.7   12261.00
     9      174.75  235.04    0.238  0.60( 0.58) 0.98   11005.8   12111.00
    10      174.24  239.60    0.237  0.60( 0.59) 0.98   11200.8   12231.00
```



```
    11      171.86  258.05    0.230  0.60( 0.59) 0.98   11864.6   12101.10
    12      151.86  297.99    0.215  0.60( 0.59) 0.98   13091.2   12010.00
    13       99.78  374.08    0.190  0.60( 0.59) 0.98   13237.1   12000.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S26.DAT
  TIME/DATE OF STUDY: 07:46 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.873
   2)   10.00;  1.249
   3)   15.00;  0.951
   4)   20.00;  0.777
   5)   25.00;  0.669
   6)   30.00;  0.593
   7)   40.00;  0.511
   8)   50.00;  0.454
   9)   60.00;  0.399
  10)   90.00;  0.345
  11)  120.00;  0.287
  12)  180.00;  0.228
  13)  360.00;  0.167
  14) 1200.00;  0.084
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S19.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1      426.54   23.73  0.60( 0.59) 0.99    3237.9   40200.00
      2      466.95   55.64  0.60( 0.60) 0.99    7715.8   40100.00
      3      514.29   69.03  0.60( 0.60) 0.99    9448.2   11831.00
      4      625.72   94.25  0.60( 0.60) 0.99   13143.3   11530.00
      5      721.22  115.16  0.60( 0.60) 0.99   17300.1   11000.00
      6      840.92  138.96  0.60( 0.60) 0.99   24091.2   10850.00
      7      770.74  153.75  0.60( 0.60) 0.99   27438.8   11220.00
      8      716.05  164.41  0.60( 0.60) 0.99   29194.0   10910.00
      9      570.45  202.50  0.60( 0.60) 0.99   35778.0   12410.00
     10      543.38  210.40  0.60( 0.60) 0.99   37190.8   10600.00
     11      538.32  234.75  0.60( 0.59) 0.99   41856.3   12261.00
     12      528.22  247.41  0.60( 0.59) 0.99   43341.0   10410.00
     13      518.22  259.36  0.60( 0.59) 0.99   44446.8   12101.10
     14      506.74  268.86  0.60( 0.59) 0.99   45276.4   10700.00
     15      495.63  286.22  0.60( 0.59) 0.99   46824.6   10200.00
     16      483.94  299.31  0.60( 0.60) 0.99   47764.2   12010.00
     17      472.55  309.35  0.60( 0.60) 0.99   48135.9   10300.00
     18      448.86  327.79  0.60( 0.60) 0.99   48441.6   10210.00
     19      395.86  375.48  0.60( 0.60) 0.99   48943.4   12000.00
     20      365.05  441.50  0.60( 0.60) 0.99   49511.8   10100.00
   TOTAL AREA(ACRES) =    49511.8

**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1      426.54   23.73  0.60( 0.59) 0.99    3237.9   40200.00
      2      466.95   55.64  0.60( 0.60) 0.99    7715.8   40100.00
      3      514.29   69.03  0.60( 0.60) 0.99    9448.2   11831.00
      4      625.72   94.25  0.60( 0.60) 0.99   13143.3   11530.00
      5      721.22  115.16  0.60( 0.60) 0.99   17300.1   11000.00
      6      840.92  138.96  0.60( 0.60) 0.99   24091.2   10850.00
      7      770.74  153.75  0.60( 0.60) 0.99   27438.8   11220.00
      8      716.05  164.41  0.60( 0.60) 0.99   29194.0   10910.00
      9      570.45  202.50  0.60( 0.60) 0.99   35778.0   12410.00
     10      543.38  210.40  0.60( 0.60) 0.99   37190.8   10600.00
     11      538.32  234.75  0.60( 0.59) 0.99   41856.3   12261.00
     12      528.22  247.41  0.60( 0.59) 0.99   43341.0   10410.00
     13      518.22  259.36  0.60( 0.59) 0.99   44446.8   12101.10
     14      506.74  268.86  0.60( 0.59) 0.99   45276.4   10700.00
     15      495.63  286.22  0.60( 0.59) 0.99   46824.6   10200.00
     16      483.94  299.31  0.60( 0.60) 0.99   47764.2   12010.00
     17      472.55  309.35  0.60( 0.60) 0.99   48135.9   10300.00
     18      448.86  327.79  0.60( 0.60) 0.99   48441.6   10210.00
```

```
     19      395.86  375.48  0.60( 0.60) 0.99   48943.4   12000.00
     20      365.05  441.50  0.60( 0.60) 0.99   49511.8   10100.00
    TOTAL AREA(ACRES) =     49511.8

****************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  12601.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    341.63  DOWNSTREAM(FEET) =    325.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1467.93   CHANNEL SLOPE =  0.0113
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.266
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.11      0.60     0.992     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     840.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.81
  AVERAGE FLOW DEPTH(FEET) =   5.35   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =  141.46
  SUBAREA AREA(ACRES) =    14.11       SUBAREA RUNOFF(CFS) =    0.03
  EFFECTIVE AREA(ACRES) =  24105.28     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    49525.9         PEAK FLOW RATE(CFS) =     840.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.35   FLOW VELOCITY(FEET/SEC.) =   9.81
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      426.54   26.69    0.643  0.60( 0.59) 0.99    3252.0   40200.00
      2      466.95   58.53    0.407  0.60( 0.60) 0.99    7729.9   40100.00
      3      514.29   71.85    0.378  0.60( 0.60) 0.99    9462.3   11831.00
      4      625.72   96.94    0.332  0.60( 0.60) 0.99   13157.5   11530.00
      5      721.22  117.75    0.291  0.60( 0.60) 0.99   17314.2   11000.00
      6      840.92  141.46    0.266  0.60( 0.60) 0.99   24105.3   10850.00
      7      770.74  156.30    0.251  0.60( 0.60) 0.99   27452.9   11220.00
      8      716.05  167.00    0.241  0.60( 0.60) 0.99   29208.1   10910.00
      9      570.45  205.24    0.219  0.60( 0.60) 0.99   35792.1   12410.00
     10      543.38  213.18    0.217  0.60( 0.60) 0.99   37204.9   10600.00
     11      538.32  237.54    0.209  0.60( 0.59) 0.99   41870.4   12261.00
     12      528.22  250.21    0.204  0.60( 0.59) 0.99   43355.1   10410.00
     13      518.22  262.17    0.200  0.60( 0.59) 0.99   44460.9   12101.10
     14      506.74  271.69    0.197  0.60( 0.59) 0.99   45290.5   10700.00
     15      495.63  289.07    0.191  0.60( 0.59) 0.99   46838.7   10200.00
     16      483.94  302.18    0.187  0.60( 0.60) 0.99   47778.3   12010.00
```



```
     17      472.55  312.23    0.183  0.60( 0.60) 0.99   48150.0   10300.00
     18      448.86  330.71    0.177  0.60( 0.60) 0.99   48455.8   10210.00
     19      395.86  378.50    0.165  0.60( 0.60) 0.99   48957.5   12000.00
     20      365.05  444.58    0.159  0.60( 0.60) 0.99   49525.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     840.92  Tc(MIN.) =  141.46
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   24105.28

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610318T.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       17.14   21.87  0.60( 0.60) 1.00     107.7   31800.00
      2       12.05   27.12  0.60( 0.60) 1.00     119.0   31810.00
    TOTAL AREA(ACRES) =      119.0

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      426.54   26.69    0.643  0.60( 0.59) 0.99    3252.0   40200.00
      2      466.95   58.53    0.407  0.60( 0.60) 0.99    7729.9   40100.00
      3      514.29   71.85    0.378  0.60( 0.60) 0.99    9462.3   11831.00
      4      625.72   96.94    0.332  0.60( 0.60) 0.99   13157.5   11530.00
      5      721.22  117.75    0.291  0.60( 0.60) 0.99   17314.2   11000.00
      6      840.92  141.46    0.266  0.60( 0.60) 0.99   24105.3   10850.00
      7      770.74  156.30    0.251  0.60( 0.60) 0.99   27452.9   11220.00
      8      716.05  167.00    0.241  0.60( 0.60) 0.99   29208.1   10910.00
      9      570.45  205.24    0.219  0.60( 0.60) 0.99   35792.1   12410.00
     10      543.38  213.18    0.217  0.60( 0.60) 0.99   37204.9   10600.00
     11      538.32  237.54    0.209  0.60( 0.59) 0.99   41870.4   12261.00
     12      528.22  250.21    0.204  0.60( 0.59) 0.99   43355.1   10410.00
     13      518.22  262.17    0.200  0.60( 0.59) 0.99   44460.9   12101.10
     14      506.74  271.69    0.197  0.60( 0.59) 0.99   45290.5   10700.00
     15      495.63  289.07    0.191  0.60( 0.59) 0.99   46838.7   10200.00
     16      483.94  302.18    0.187  0.60( 0.60) 0.99   47778.3   12010.00
     17      472.55  312.23    0.183  0.60( 0.60) 0.99   48150.0   10300.00
     18      448.86  330.71    0.177  0.60( 0.60) 0.99   48455.8   10210.00
     19      395.86  378.50    0.165  0.60( 0.60) 0.99   48957.5   12000.00
     20      365.05  444.58    0.159  0.60( 0.60) 0.99   49525.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       17.14   21.87    0.737  0.60( 0.60) 1.00     107.7   31800.00
      2       12.05   27.12    0.637  0.60( 0.60) 1.00     119.0   31810.00
```

LONGEST FLOWPATH FROM NODE 31810.00 TO NODE 12601.00 = 4599.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	443.69	21.87	0.737	0.60(0.59)	0.99	2773.0	31800.00
2	439.02	26.69	0.643	0.60(0.59)	0.99	3370.0	40200.00
3	439.15	27.12	0.637	0.60(0.59)	0.99	3432.4	31810.00
4	466.95	58.53	0.407	0.60(0.60)	0.99	7848.9	40100.00
5	514.29	71.85	0.378	0.60(0.60)	0.99	9581.4	11831.00
6	625.72	96.94	0.332	0.60(0.60)	0.99	13276.5	11530.00
7	721.22	117.75	0.291	0.60(0.60)	0.99	17433.2	11000.00
8	840.92	141.46	0.266	0.60(0.60)	0.99	24224.3	10850.00
9	770.74	156.30	0.251	0.60(0.60)	0.99	27571.9	11220.00
10	716.05	167.00	0.241	0.60(0.60)	0.99	29327.2	10910.00
11	570.45	205.24	0.219	0.60(0.60)	0.99	35911.1	12410.00
12	543.38	213.18	0.217	0.60(0.60)	0.99	37323.9	10600.00
13	538.32	237.54	0.209	0.60(0.59)	0.99	41989.4	12261.00
14	528.22	250.21	0.204	0.60(0.59)	0.99	43474.1	10410.00
15	518.22	262.17	0.200	0.60(0.59)	0.99	44579.9	12101.10
16	506.74	271.69	0.197	0.60(0.59)	0.99	45409.6	10700.00
17	495.63	289.07	0.191	0.60(0.59)	0.99	46957.7	10200.00
18	483.94	302.18	0.187	0.60(0.60)	0.99	47897.4	12010.00
19	472.55	312.23	0.183	0.60(0.60)	0.99	48269.1	10300.00
20	448.86	330.71	0.177	0.60(0.60)	0.99	48574.8	10210.00
21	395.86	378.50	0.165	0.60(0.60)	0.99	49076.5	12000.00
22	365.05	444.58	0.159	0.60(0.60)	0.99	49644.9	10100.00

TOTAL AREA(ACRES) = 49644.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 840.92 Tc(MIN.) = 141.458
EFFECTIVE AREA(ACRES) = 24224.30 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49644.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

****
FLOW PROCESS FROM NODE 12601.00 TO NODE 12602.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 325.00 DOWNSTREAM(FEET) = 313.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1377.46 CHANNEL SLOPE = 0.0087
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 840.92
FLOW VELOCITY(FEET/SEC.) = 8.88 FLOW DEPTH(FEET) = 5.62
TRAVEL TIME(MIN.) = 2.59 Tc(MIN.) = 144.04
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12602.00 = 101245.91 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	443.69	24.90	0.671	0.60(0.59)	0.99	2773.0	31800.00
2	439.02	29.72	0.597	0.60(0.59)	0.99	3370.0	40200.00
3	439.15	30.17	0.592	0.60(0.59)	0.99	3432.4	31810.00
4	466.95	61.53	0.396	0.60(0.60)	0.99	7848.9	40100.00

5	514.29	74.77	0.372	0.60(0.60)	0.99	9581.4	11831.00
6	625.72	99.71	0.326	0.60(0.60)	0.99	13276.5	11530.00
7	721.22	120.43	0.287	0.60(0.60)	0.99	17433.2	11000.00
8	840.92	144.04	0.263	0.60(0.60)	0.99	24224.3	10850.00
9	770.74	158.94	0.249	0.60(0.60)	0.99	27571.9	11220.00
10	716.05	169.69	0.238	0.60(0.60)	0.99	29327.2	10910.00
11	570.45	208.09	0.218	0.60(0.60)	0.99	35911.1	12410.00
12	543.38	216.06	0.216	0.60(0.60)	0.99	37323.9	10600.00
13	538.32	240.43	0.208	0.60(0.59)	0.99	41989.4	12261.00
14	528.22	253.12	0.203	0.60(0.59)	0.99	43474.1	10410.00
15	518.22	265.08	0.199	0.60(0.59)	0.99	44579.9	12101.10
16	506.74	274.62	0.196	0.60(0.59)	0.99	45409.6	10700.00
17	495.63	292.02	0.190	0.60(0.59)	0.99	46957.7	10200.00
18	483.94	305.15	0.186	0.60(0.60)	0.99	47897.4	12010.00
19	472.55	315.22	0.182	0.60(0.60)	0.99	48269.1	10300.00
20	448.86	333.73	0.176	0.60(0.60)	0.99	48574.8	10210.00
21	395.86	381.61	0.165	0.60(0.60)	0.99	49076.5	12000.00
22	365.05	447.76	0.158	0.60(0.60)	0.99	49644.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 840.92 Tc(MIN.) = 144.04
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24224.30

****
FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 313.00 DOWNSTREAM(FEET) = 310.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 312.40 CHANNEL SLOPE = 0.0096
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 840.92
FLOW VELOCITY(FEET/SEC.) = 9.22 FLOW DEPTH(FEET) = 5.51
TRAVEL TIME(MIN.) = 0.56 Tc(MIN.) = 144.61
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	443.69	25.57	0.660	0.60(0.59)	0.99	2773.0	31800.00
2	439.02	30.39	0.590	0.60(0.59)	0.99	3370.0	40200.00
3	439.15	30.83	0.586	0.60(0.59)	0.99	3432.4	31810.00
4	466.95	62.18	0.395	0.60(0.60)	0.99	7848.9	40100.00
5	514.29	75.41	0.371	0.60(0.60)	0.99	9581.4	11831.00
6	625.72	100.32	0.325	0.60(0.60)	0.99	13276.5	11530.00
7	721.22	121.02	0.286	0.60(0.60)	0.99	17433.2	11000.00
8	840.92	144.61	0.263	0.60(0.60)	0.99	24224.3	10850.00
9	770.74	159.52	0.248	0.60(0.60)	0.99	27571.9	11220.00
10	716.05	170.28	0.238	0.60(0.60)	0.99	29327.2	10910.00
11	570.45	208.71	0.218	0.60(0.60)	0.99	35911.1	12410.00
12	543.38	216.69	0.216	0.60(0.60)	0.99	37323.9	10600.00
13	538.32	241.06	0.207	0.60(0.59)	0.99	41989.4	12261.00
14	528.22	253.75	0.203	0.60(0.59)	0.99	43474.1	10410.00
15	518.22	265.72	0.199	0.60(0.59)	0.99	44579.9	12101.10
16	506.74	275.26	0.196	0.60(0.59)	0.99	45409.6	10700.00
17	495.63	292.66	0.190	0.60(0.59)	0.99	46957.7	10200.00

```
    18      483.94  305.79    0.185  0.60( 0.60) 0.99   47897.4   12010.00
    19      472.55  315.87    0.182  0.60( 0.60) 0.99   48269.1   10300.00
    20      448.86  334.39    0.176  0.60( 0.60) 0.99   48574.8   10210.00
    21      395.86  382.29    0.165  0.60( 0.60) 0.99   49076.5   12000.00
    22      365.05  448.46    0.158  0.60( 0.60) 0.99   49644.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     840.92  Tc(MIN.) =  144.61
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   24224.30

****************************************************************************
  FLOW PROCESS FROM NODE  12602.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610317T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        9.43   19.96  0.60( 0.60) 1.00       59.8   31700.00
      2        6.16   26.59  0.60( 0.60) 1.00       71.3   31710.00
    TOTAL AREA(ACRES) =       71.3

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      443.69   25.57    0.660  0.60( 0.59) 0.99    2773.0   31800.00
      2      439.02   30.39    0.590  0.60( 0.59) 0.99    3370.0   40200.00
      3      439.15   30.83    0.586  0.60( 0.59) 0.99    3432.4   31810.00
      4      466.95   62.18    0.395  0.60( 0.60) 0.99    7848.9   40100.00
      5      514.29   75.41    0.371  0.60( 0.60) 0.99    9581.4   11831.00
      6      625.72  100.32    0.325  0.60( 0.60) 0.99   13276.5   11530.00
      7      721.22  121.02    0.286  0.60( 0.60) 0.99   17433.2   11000.00
      8      840.92  144.61    0.263  0.60( 0.60) 0.99   24224.3   10850.00
      9      770.74  159.52    0.248  0.60( 0.60) 0.99   27571.9   11220.00
     10      716.05  170.28    0.238  0.60( 0.60) 0.99   29327.2   10910.00
     11      570.45  208.71    0.218  0.60( 0.60) 0.99   35911.1   12410.00
     12      543.38  216.69    0.216  0.60( 0.60) 0.99   37323.9   10600.00
     13      538.32  241.06    0.207  0.60( 0.59) 0.99   41989.4   12261.00
     14      528.22  253.75    0.203  0.60( 0.59) 0.99   43474.1   10410.00
     15      518.22  265.72    0.199  0.60( 0.59) 0.99   44579.9   12101.10
     16      506.74  275.26    0.196  0.60( 0.59) 0.99   45409.6   10700.00
     17      495.63  292.66    0.190  0.60( 0.59) 0.99   46957.7   10200.00
     18      483.94  305.79    0.185  0.60( 0.60) 0.99   47897.4   12010.00
     19      472.55  315.87    0.182  0.60( 0.60) 0.99   48269.1   10300.00
     20      448.86  334.39    0.176  0.60( 0.60) 0.99   48574.8   10210.00
```



```
    21      395.86  382.29    0.165  0.60( 0.60) 0.99   49076.5   12000.00
    22      365.05  448.46    0.158  0.60( 0.60) 0.99   49644.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        9.43   19.96    0.778  0.60( 0.60) 1.00       59.8   31700.00
      2        6.16   26.59    0.645  0.60( 0.60) 1.00       71.3   31710.00
  LONGEST FLOWPATH FROM NODE  31710.00 TO NODE  12603.00 =    3633.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      453.12   19.96    0.778  0.60( 0.59) 0.99    2224.7   31700.00
      2      450.35   25.57    0.660  0.60( 0.59) 0.99    2842.5   31800.00
      3      448.85   26.59    0.645  0.60( 0.59) 0.99    2971.3   31710.00
      4      439.02   30.39    0.590  0.60( 0.59) 0.99    3441.3   40200.00
      5      439.15   30.83    0.586  0.60( 0.59) 0.99    3503.6   31810.00
      6      466.95   62.18    0.395  0.60( 0.60) 0.99    7920.2   40100.00
      7      514.29   75.41    0.371  0.60( 0.60) 0.99    9652.6   11831.00
      8      625.72  100.32    0.325  0.60( 0.60) 0.99   13347.8   11530.00
      9      721.22  121.02    0.286  0.60( 0.60) 0.99   17504.5   11000.00
     10      840.92  144.61    0.263  0.60( 0.60) 0.99   24295.6   10850.00
     11      770.74  159.52    0.248  0.60( 0.60) 0.99   27643.2   11220.00
     12      716.05  170.28    0.238  0.60( 0.60) 0.99   29398.4   10910.00
     13      570.45  208.71    0.218  0.60( 0.60) 0.99   35982.4   12410.00
     14      543.38  216.69    0.216  0.60( 0.60) 0.99   37395.2   10600.00
     15      538.32  241.06    0.207  0.60( 0.59) 0.99   42060.7   12261.00
     16      528.22  253.75    0.203  0.60( 0.59) 0.99   43545.4   10410.00
     17      518.22  265.72    0.199  0.60( 0.59) 0.99   44651.2   12101.10
     18      506.74  275.26    0.196  0.60( 0.59) 0.99   45480.8   10700.00
     19      495.63  292.66    0.190  0.60( 0.59) 0.99   47029.0   10200.00
     20      483.94  305.79    0.185  0.60( 0.60) 0.99   47968.6   12010.00
     21      472.55  315.87    0.182  0.60( 0.60) 0.99   48340.3   10300.00
     22      448.86  334.39    0.176  0.60( 0.60) 0.99   48646.1   10210.00
     23      395.86  382.29    0.165  0.60( 0.60) 0.99   49147.8   12000.00
     24      365.05  448.46    0.158  0.60( 0.60) 0.99   49716.2   10100.00
    TOTAL AREA(ACRES) =     49716.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      840.92  Tc(MIN.) =  144.607
  EFFECTIVE AREA(ACRES) =  24295.57  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49716.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
```

PEAK FLOWRATE TABLE FILE NAME: 0610403T.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.58	25.67	0.60(0.58)	0.97	175.0	40300.00

TOTAL AREA(ACRES) = 175.0

****
FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	453.12	19.96	0.778	0.60(0.59)	0.99	2224.7	31700.00
2	450.35	25.57	0.660	0.60(0.59)	0.99	2842.5	31800.00
3	448.85	26.59	0.645	0.60(0.59)	0.99	2971.3	31710.00
4	439.02	30.39	0.590	0.60(0.59)	0.99	3441.3	40200.00
5	439.15	30.83	0.586	0.60(0.59)	0.99	3503.6	31810.00
6	466.95	62.18	0.395	0.60(0.60)	0.99	7920.2	40100.00
7	514.29	75.41	0.371	0.60(0.60)	0.99	9652.6	11831.00
8	625.72	100.32	0.325	0.60(0.60)	0.99	13347.8	11530.00
9	721.22	121.02	0.286	0.60(0.60)	0.99	17504.5	11000.00
10	840.92	144.61	0.263	0.60(0.60)	0.99	24295.6	10850.00
11	770.74	159.52	0.248	0.60(0.60)	0.99	27643.2	11220.00
12	716.05	170.28	0.238	0.60(0.60)	0.99	29398.4	10910.00
13	570.45	208.71	0.218	0.60(0.60)	0.99	35982.4	12410.00
14	543.38	216.69	0.216	0.60(0.60)	0.99	37395.2	10600.00
15	538.32	241.06	0.207	0.60(0.59)	0.99	42060.7	12261.00
16	528.22	253.75	0.203	0.60(0.59)	0.99	43545.4	10410.00
17	518.22	265.72	0.199	0.60(0.59)	0.99	44651.2	12101.10
18	506.74	275.26	0.196	0.60(0.59)	0.99	45480.8	10700.00
19	495.63	292.66	0.190	0.60(0.59)	0.99	47029.0	10200.00
20	483.94	305.79	0.185	0.60(0.60)	0.99	47968.6	12010.00
21	472.55	315.87	0.182	0.60(0.60)	0.99	48340.3	10300.00
22	448.86	334.39	0.176	0.60(0.60)	0.99	48646.1	10210.00
23	395.86	382.29	0.165	0.60(0.60)	0.99	49147.8	12000.00
24	365.05	448.46	0.158	0.60(0.60)	0.99	49716.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.58	25.67	0.659	0.60(0.58)	0.97	175.0	40300.00

LONGEST FLOWPATH FROM NODE 40300.00 TO NODE 12603.00 = 5256.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	465.69	19.96	0.778	0.60(0.59)	0.99	2360.8	31700.00
2	462.93	25.57	0.660	0.60(0.59)	0.99	3016.8	31800.00
3	462.78	25.67	0.659	0.60(0.59)	0.99	3030.6	40300.00
4	459.23	26.59	0.645	0.60(0.59)	0.99	3146.3	31710.00
5	442.26	30.39	0.590	0.60(0.59)	0.99	3616.4	40200.00
6	442.37	30.83	0.586	0.60(0.59)	0.99	3678.7	31810.00
7	469.11	62.18	0.395	0.60(0.59)	0.99	8095.2	40100.00

8	516.32	75.41	0.371	0.60(0.59)	0.99	9827.7	11831.00
9	627.50	100.32	0.325	0.60(0.60)	0.99	13522.8	11530.00
10	722.79	121.02	0.286	0.60(0.60)	0.99	17679.5	11000.00
11	842.37	144.61	0.263	0.60(0.60)	0.99	24470.6	10850.00
12	772.10	159.52	0.248	0.60(0.60)	0.99	27818.3	11220.00
13	717.36	170.28	0.238	0.60(0.60)	0.99	29573.5	10910.00
14	571.65	208.71	0.218	0.60(0.60)	0.99	36157.4	12410.00
15	544.56	216.69	0.216	0.60(0.60)	0.99	37570.2	10600.00
16	539.45	241.06	0.207	0.60(0.59)	0.99	42235.7	12261.00
17	529.33	253.75	0.203	0.60(0.59)	0.99	43720.5	10410.00
18	519.31	265.72	0.199	0.60(0.59)	0.99	44826.2	12101.10
19	507.81	275.26	0.196	0.60(0.59)	0.99	45655.9	10700.00
20	496.67	292.66	0.190	0.60(0.59)	0.99	47204.0	10200.00
21	484.95	305.79	0.185	0.60(0.59)	0.99	48143.7	12010.00
22	473.55	315.87	0.182	0.60(0.60)	0.99	48515.4	10300.00
23	449.82	334.39	0.176	0.60(0.60)	0.99	48821.1	10210.00
24	396.76	382.29	0.165	0.60(0.60)	0.99	49322.8	12000.00
25	365.91	448.46	0.158	0.60(0.60)	0.99	49891.2	10100.00

TOTAL AREA(ACRES) = 49891.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 842.37 Tc(MIN.) = 144.607
EFFECTIVE AREA(ACRES) = 24470.62 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49891.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

****
FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 310.00 DOWNSTREAM(FEET) = 307.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 459.69 CHANNEL SLOPE = 0.0065
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 842.37
FLOW VELOCITY(FEET/SEC.) = 7.98 FLOW DEPTH(FEET) = 5.93
TRAVEL TIME(MIN.) = 0.96 Tc(MIN.) = 145.57
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12604.00 = 102017.99 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	465.69	21.07	0.754	0.60(0.59)	0.99	2360.8	31700.00
2	462.93	26.68	0.643	0.60(0.59)	0.99	3016.8	31800.00
3	462.78	26.79	0.642	0.60(0.59)	0.99	3030.6	40300.00
4	459.23	27.71	0.628	0.60(0.59)	0.99	3146.3	31710.00
5	442.26	31.52	0.581	0.60(0.59)	0.99	3616.4	40200.00
6	442.37	31.96	0.577	0.60(0.59)	0.99	3678.7	31810.00
7	469.11	63.29	0.393	0.60(0.59)	0.99	8095.2	40100.00
8	516.32	76.50	0.369	0.60(0.59)	0.99	9827.7	11831.00
9	627.50	101.36	0.323	0.60(0.60)	0.99	13522.8	11530.00
10	722.79	122.02	0.285	0.60(0.60)	0.99	17679.5	11000.00
11	842.37	145.57	0.262	0.60(0.60)	0.99	24470.6	10850.00
12	772.10	160.50	0.247	0.60(0.60)	0.99	27818.3	11220.00
13	717.36	171.28	0.237	0.60(0.60)	0.99	29573.5	10910.00

14	571.65	209.77	0.218	0.60(0.60)	0.99	36157.4	12410.00
15	544.56	217.76	0.215	0.60(0.60)	0.99	37570.2	10600.00
16	539.45	242.13	0.207	0.60(0.59)	0.99	42235.7	12261.00
17	529.33	254.83	0.203	0.60(0.59)	0.99	43720.5	10410.00
18	519.31	266.80	0.199	0.60(0.59)	0.99	44826.2	12101.10
19	507.81	276.35	0.195	0.60(0.59)	0.99	45655.9	10700.00
20	496.67	293.76	0.189	0.60(0.59)	0.99	47204.0	10200.00
21	484.95	306.90	0.185	0.60(0.59)	0.99	48143.7	12010.00
22	473.55	316.98	0.182	0.60(0.60)	0.99	48515.4	10300.00
23	449.82	335.52	0.175	0.60(0.60)	0.99	48821.1	10210.00
24	396.76	383.45	0.165	0.60(0.60)	0.99	49322.8	12000.00
25	365.91	449.64	0.158	0.60(0.60)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 842.37 Tc(MIN.) = 145.57
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24470.62

****
FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 307.00 DOWNSTREAM(FEET) = 305.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 427.54 CHANNEL SLOPE = 0.0047
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 842.37
FLOW VELOCITY(FEET/SEC.) = 7.04 FLOW DEPTH(FEET) = 6.31
TRAVEL TIME(MIN.) = 1.01 Tc(MIN.) = 146.58
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.00 = 102445.53 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	465.69	22.25	0.728	0.60(0.59)	0.99	2360.8	31700.00
2	462.93	27.86	0.626	0.60(0.59)	0.99	3016.8	31800.00
3	462.78	27.96	0.624	0.60(0.59)	0.99	3030.6	40300.00
4	459.23	28.89	0.610	0.60(0.59)	0.99	3146.3	31710.00
5	442.26	32.71	0.571	0.60(0.59)	0.99	3616.4	40200.00
6	442.37	33.15	0.567	0.60(0.59)	0.99	3678.7	31810.00
7	469.11	64.46	0.391	0.60(0.59)	0.99	8095.2	40100.00
8	516.32	77.64	0.367	0.60(0.59)	0.99	9827.7	11831.00
9	627.50	102.45	0.321	0.60(0.60)	0.99	13522.8	11530.00
10	722.79	123.07	0.284	0.60(0.60)	0.99	17679.5	11000.00
11	842.37	146.58	0.261	0.60(0.60)	0.99	24470.6	10850.00
12	772.10	161.54	0.246	0.60(0.60)	0.99	27818.3	11220.00
13	717.36	172.34	0.236	0.60(0.60)	0.99	29573.5	10910.00
14	571.65	210.88	0.218	0.60(0.60)	0.99	36157.4	12410.00
15	544.56	218.89	0.215	0.60(0.60)	0.99	37570.2	10600.00
16	539.45	243.26	0.207	0.60(0.59)	0.99	42235.7	12261.00
17	529.33	255.97	0.202	0.60(0.59)	0.99	43720.5	10410.00

18	519.31	267.95	0.198	0.60(0.59)	0.99	44826.2	12101.10
19	507.81	277.50	0.195	0.60(0.59)	0.99	45655.9	10700.00
20	496.67	294.91	0.189	0.60(0.59)	0.99	47204.0	10200.00
21	484.95	308.06	0.185	0.60(0.59)	0.99	48143.7	12010.00
22	473.55	318.15	0.181	0.60(0.60)	0.99	48515.4	10300.00
23	449.82	336.70	0.175	0.60(0.60)	0.99	48821.1	10210.00
24	396.76	384.67	0.165	0.60(0.60)	0.99	49322.8	12000.00
25	365.91	450.89	0.158	0.60(0.60)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 842.37 Tc(MIN.) = 146.58
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24470.62

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========
MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12605.00 TO NODE 12605.30 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 305.00 DOWNSTREAM(FEET) = 302.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 217.28 CHANNEL SLOPE = 0.0138
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 842.37
FLOW VELOCITY(FEET/SEC.) = 10.57 FLOW DEPTH(FEET) = 5.15
TRAVEL TIME(MIN.) = 0.34 Tc(MIN.) = 146.92
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	465.69	22.65	0.720	0.60(0.59)	0.99	2360.8	31700.00
2	462.93	28.26	0.620	0.60(0.59)	0.99	3016.8	31800.00
3	462.78	28.36	0.618	0.60(0.59)	0.99	3030.6	40300.00
4	459.23	29.29	0.604	0.60(0.59)	0.99	3146.3	31710.00
5	442.26	33.11	0.568	0.60(0.59)	0.99	3616.4	40200.00
6	442.37	33.55	0.564	0.60(0.59)	0.99	3678.7	31810.00
7	469.11	64.86	0.390	0.60(0.59)	0.99	8095.2	40100.00
8	516.32	78.03	0.367	0.60(0.59)	0.99	9827.7	11831.00
9	627.50	102.82	0.320	0.60(0.60)	0.99	13522.8	11530.00
10	722.79	123.43	0.284	0.60(0.60)	0.99	17679.5	11000.00
11	842.37	146.92	0.261	0.60(0.60)	0.99	24470.6	10850.00
12	772.10	161.89	0.246	0.60(0.60)	0.99	27818.3	11220.00
13	717.36	172.69	0.235	0.60(0.60)	0.99	29573.5	10910.00
14	571.65	211.26	0.217	0.60(0.60)	0.99	36157.4	12410.00
15	544.56	219.27	0.215	0.60(0.60)	0.99	37570.2	10600.00
16	539.45	243.65	0.206	0.60(0.59)	0.99	42235.7	12261.00
17	529.33	256.35	0.202	0.60(0.59)	0.99	43720.5	10410.00
18	519.31	268.33	0.198	0.60(0.59)	0.99	44826.2	12101.10
19	507.81	277.89	0.195	0.60(0.59)	0.99	45655.9	10700.00
20	496.67	295.30	0.189	0.60(0.59)	0.99	47204.0	10200.00

```
    21      484.95  308.45    0.184  0.60( 0.59) 0.99   48143.7   12010.00
    22      473.55  318.54    0.181  0.60( 0.60) 0.99   48515.4   10300.00
    23      449.82  337.10    0.175  0.60( 0.60) 0.99   48821.1   10210.00
    24      396.76  385.09    0.165  0.60( 0.60) 0.99   49322.8   12000.00
    25      365.91  451.31    0.158  0.60( 0.60) 0.99   49891.2   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     842.37  Tc(MIN.) =  146.92
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   24470.62

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
  ***MEMORY BANK #  3 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610404T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       62.15   24.51  0.60( 0.59) 0.99     393.3   40430.00
      2       59.42   25.09  0.60( 0.59) 0.99     396.7   40440.00
      3       46.67   27.60  0.60( 0.59) 0.99     409.2   40420.00
      4       45.68   27.81  0.60( 0.59) 0.99     409.9   40400.00
      5       44.28   28.05  0.60( 0.59) 0.99     410.5   40410.00
    TOTAL AREA(ACRES) =      410.5

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      465.69   22.65    0.720  0.60( 0.59) 0.99    2360.8   31700.00
      2      462.93   28.26    0.620  0.60( 0.59) 0.99    3016.8   31800.00
      3      462.78   28.36    0.618  0.60( 0.59) 0.99    3030.6   40300.00
      4      459.23   29.29    0.604  0.60( 0.59) 0.99    3146.3   31710.00
      5      442.26   33.11    0.568  0.60( 0.59) 0.99    3616.4   40200.00
      6      442.37   33.55    0.564  0.60( 0.59) 0.99    3678.7   31810.00
      7      469.11   64.86    0.390  0.60( 0.59) 0.99    8095.2   40100.00
      8      516.32   78.03    0.367  0.60( 0.59) 0.99    9827.7   11831.00
      9      627.50  102.82    0.320  0.60( 0.60) 0.99   13522.8   11530.00
     10      722.79  123.43    0.284  0.60( 0.60) 0.99   17679.5   11000.00
     11      842.37  146.92    0.261  0.60( 0.60) 0.99   24470.6   10850.00
     12      772.10  161.89    0.246  0.60( 0.60) 0.99   27818.3   11220.00
     13      717.36  172.69    0.235  0.60( 0.60) 0.99   29573.5   10910.00
     14      571.65  211.26    0.217  0.60( 0.60) 0.99   36157.4   12410.00
     15      544.56  219.27    0.215  0.60( 0.60) 0.99   37570.2   10600.00
     16      539.45  243.65    0.206  0.60( 0.59) 0.99   42235.7   12261.00
```



```
    17      529.33  256.35    0.202  0.60( 0.59) 0.99   43720.5   10410.00
    18      519.31  268.33    0.198  0.60( 0.59) 0.99   44826.2   12101.10
    19      507.81  277.89    0.195  0.60( 0.59) 0.99   45655.9   10700.00
    20      496.67  295.30    0.189  0.60( 0.59) 0.99   47204.0   10200.00
    21      484.95  308.45    0.184  0.60( 0.59) 0.99   48143.7   12010.00
    22      473.55  318.54    0.181  0.60( 0.60) 0.99   48515.4   10300.00
    23      449.82  337.10    0.175  0.60( 0.60) 0.99   48821.1   10210.00
    24      396.76  385.09    0.165  0.60( 0.60) 0.99   49322.8   12000.00
    25      365.91  451.31    0.158  0.60( 0.60) 0.99   49891.2   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1       62.15   24.51    0.680  0.60( 0.59) 0.99     393.3   40430.00
    2       59.42   25.09    0.668  0.60( 0.59) 0.99     396.7   40440.00
    3       46.67   27.60    0.629  0.60( 0.59) 0.99     409.2   40420.00
    4       45.68   27.81    0.626  0.60( 0.59) 0.99     409.9   40400.00
    5       44.28   28.05    0.623  0.60( 0.59) 0.99     410.5   40410.00
LONGEST FLOWPATH FROM NODE  40400.00 TO NODE  12605.30 =    7428.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      527.85   22.65    0.720  0.60( 0.59) 0.99    2724.2   31700.00
    2      526.93   24.51    0.680  0.60( 0.59) 0.99    2972.1   40430.00
    3      523.92   25.09    0.668  0.60( 0.59) 0.99    3042.8   40440.00
    4      509.93   27.60    0.629  0.60( 0.59) 0.99    3349.8   40420.00
    5      508.83   27.81    0.626  0.60( 0.59) 0.99    3374.3   40400.00
    6      507.31   28.05    0.623  0.60( 0.59) 0.99    3403.7   40410.00
    7      502.36   28.26    0.620  0.60( 0.59) 0.99    3427.3   31800.00
    8      499.68   28.36    0.618  0.60( 0.59) 0.99    3441.1   40300.00
    9      473.86   29.29    0.604  0.60( 0.59) 0.99    3556.8   31710.00
   10      450.15   33.11    0.568  0.60( 0.59) 0.99    4026.8   40200.00
   11      450.21   33.55    0.564  0.60( 0.59) 0.99    4089.1   31810.00
   12      474.54   64.86    0.390  0.60( 0.59) 0.99    8505.7   40100.00
   13      521.42   78.03    0.367  0.60( 0.59) 0.99   10238.1   11831.00
   14      631.96  102.82    0.320  0.60( 0.60) 0.99   13933.3   11530.00
   15      726.73  123.43    0.284  0.60( 0.60) 0.99   18090.0   11000.00
   16      845.99  146.92    0.261  0.60( 0.60) 0.99   24881.1   10850.00
   17      775.52  161.89    0.246  0.60( 0.60) 0.99   28228.7   11220.00
   18      720.63  172.69    0.235  0.60( 0.60) 0.99   29983.9   10910.00
   19      574.67  211.26    0.217  0.60( 0.60) 0.99   36567.9   12410.00
   20      547.55  219.27    0.215  0.60( 0.60) 0.99   37980.7   10600.00
   21      542.33  243.65    0.206  0.60( 0.59) 0.99   42646.2   12261.00
   22      532.14  256.35    0.202  0.60( 0.59) 0.99   44130.9   10410.00
   23      522.07  268.33    0.198  0.60( 0.59) 0.99   45236.7   12101.10
   24      510.52  277.89    0.195  0.60( 0.59) 0.99   46066.3   10700.00
   25      499.30  295.30    0.189  0.60( 0.59) 0.99   47614.5   10200.00
   26      487.52  308.45    0.184  0.60( 0.59) 0.99   48554.2   12010.00
   27      476.07  318.54    0.181  0.60( 0.60) 0.99   48925.8   10300.00
   28      452.25  337.10    0.175  0.60( 0.60) 0.99   49231.6   10210.00
   29      399.05  385.09    0.165  0.60( 0.60) 0.99   49733.3   12000.00
   30      368.11  451.31    0.158  0.60( 0.60) 0.99   50301.7   10100.00
  TOTAL AREA(ACRES) =     50301.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      845.99  Tc(MIN.) =  146.922
```

EFFECTIVE AREA(ACRES) = 24881.09 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50301.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

****
FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.60 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 302.00 DOWNSTREAM(FEET) = 295.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 738.76 CHANNEL SLOPE = 0.0095
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 845.99
FLOW VELOCITY(FEET/SEC.) = 9.18 FLOW DEPTH(FEET) = 5.54
TRAVEL TIME(MIN.) = 1.34 Tc(MIN.) = 148.26
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	527.85	24.15	0.687	0.60(0.59)	0.99	2724.2	31700.00
2	526.93	26.02	0.654	0.60(0.59)	0.99	2972.1	40430.00
3	523.92	26.60	0.645	0.60(0.59)	0.99	3042.8	40440.00
4	509.93	29.12	0.606	0.60(0.59)	0.99	3349.8	40420.00
5	508.83	29.33	0.603	0.60(0.59)	0.99	3374.3	40400.00
6	507.31	29.58	0.599	0.60(0.59)	0.99	3403.7	40410.00
7	502.36	29.78	0.596	0.60(0.59)	0.99	3427.3	31800.00
8	499.68	29.89	0.595	0.60(0.59)	0.99	3441.1	40300.00
9	473.86	30.84	0.586	0.60(0.59)	0.99	3556.8	31710.00
10	450.15	34.68	0.555	0.60(0.59)	0.99	4026.8	40200.00
11	450.21	35.12	0.551	0.60(0.59)	0.99	4089.1	31810.00
12	474.54	66.41	0.387	0.60(0.59)	0.99	8505.7	40100.00
13	521.42	79.54	0.364	0.60(0.59)	0.99	10238.1	11831.00
14	631.96	104.26	0.317	0.60(0.60)	0.99	13933.3	11530.00
15	726.73	124.82	0.282	0.60(0.60)	0.99	18090.0	11000.00
16	845.99	148.26	0.259	0.60(0.60)	0.99	24881.1	10850.00
17	775.52	163.26	0.244	0.60(0.60)	0.99	28228.7	11220.00
18	720.63	174.09	0.234	0.60(0.60)	0.99	29983.9	10910.00
19	574.67	212.74	0.217	0.60(0.60)	0.99	36567.9	12410.00
20	547.55	220.76	0.214	0.60(0.60)	0.99	37980.7	10600.00
21	542.33	245.14	0.206	0.60(0.59)	0.99	42646.2	12261.00
22	532.14	257.86	0.202	0.60(0.59)	0.99	44130.9	10410.00
23	522.07	269.85	0.198	0.60(0.59)	0.99	45236.7	12101.10
24	510.52	279.41	0.194	0.60(0.59)	0.99	46066.3	10700.00
25	499.30	296.83	0.188	0.60(0.59)	0.99	47614.5	10200.00
26	487.52	309.99	0.184	0.60(0.59)	0.99	48554.2	12010.00
27	476.07	320.09	0.181	0.60(0.60)	0.99	48925.8	10300.00
28	452.25	338.67	0.174	0.60(0.60)	0.99	49231.6	10210.00
29	399.05	386.70	0.164	0.60(0.60)	0.99	49733.3	12000.00
30	368.11	452.96	0.158	0.60(0.60)	0.99	50301.7	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 845.99 Tc(MIN.) = 148.26
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24881.09

****
FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==

****
FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: 0610405T.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21.10	16.84	0.60(0.60)	1.00	75.7	40510.00
2	18.91	19.22	0.60(0.60)	1.00	81.4	40500.00

TOTAL AREA(ACRES) = 81.4

****
FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	527.85	24.15	0.687	0.60(0.59)	0.99	2724.2	31700.00
2	526.93	26.02	0.654	0.60(0.59)	0.99	2972.1	40430.00
3	523.92	26.60	0.645	0.60(0.59)	0.99	3042.8	40440.00
4	509.93	29.12	0.606	0.60(0.59)	0.99	3349.8	40420.00
5	508.83	29.33	0.603	0.60(0.59)	0.99	3374.3	40400.00
6	507.31	29.58	0.599	0.60(0.59)	0.99	3403.7	40410.00
7	502.36	29.78	0.596	0.60(0.59)	0.99	3427.3	31800.00
8	499.68	29.89	0.595	0.60(0.59)	0.99	3441.1	40300.00
9	473.86	30.84	0.586	0.60(0.59)	0.99	3556.8	31710.00
10	450.15	34.68	0.555	0.60(0.59)	0.99	4026.8	40200.00
11	450.21	35.12	0.551	0.60(0.59)	0.99	4089.1	31810.00
12	474.54	66.41	0.387	0.60(0.59)	0.99	8505.7	40100.00
13	521.42	79.54	0.364	0.60(0.59)	0.99	10238.1	11831.00
14	631.96	104.26	0.317	0.60(0.60)	0.99	13933.3	11530.00
15	726.73	124.82	0.282	0.60(0.60)	0.99	18090.0	11000.00
16	845.99	148.26	0.259	0.60(0.60)	0.99	24881.1	10850.00
17	775.52	163.26	0.244	0.60(0.60)	0.99	28228.7	11220.00
18	720.63	174.09	0.234	0.60(0.60)	0.99	29983.9	10910.00
19	574.67	212.74	0.217	0.60(0.60)	0.99	36567.9	12410.00
20	547.55	220.76	0.214	0.60(0.60)	0.99	37980.7	10600.00
21	542.33	245.14	0.206	0.60(0.59)	0.99	42646.2	12261.00
22	532.14	257.86	0.202	0.60(0.59)	0.99	44130.9	10410.00
23	522.07	269.85	0.198	0.60(0.59)	0.99	45236.7	12101.10
24	510.52	279.41	0.194	0.60(0.59)	0.99	46066.3	10700.00
25	499.30	296.83	0.188	0.60(0.59)	0.99	47614.5	10200.00
26	487.52	309.99	0.184	0.60(0.59)	0.99	48554.2	12010.00
27	476.07	320.09	0.181	0.60(0.60)	0.99	48925.8	10300.00
28	452.25	338.67	0.174	0.60(0.60)	0.99	49231.6	10210.00
29	399.05	386.70	0.164	0.60(0.60)	0.99	49733.3	12000.00
30	368.11	452.96	0.158	0.60(0.60)	0.99	50301.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21.10	16.84	0.887	0.60(0.60)	1.00	75.7	40510.00
2	18.91	19.22	0.804	0.60(0.60)	1.00	81.4	40500.00

LONGEST FLOWPATH FROM NODE 40500.00 TO NODE 12605.60 = 4091.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	548.94	16.84	0.887	0.60(0.59)	0.99	1975.4	40510.00
2	546.76	19.22	0.804	0.60(0.59)	0.99	2249.3	40500.00
3	536.01	24.15	0.687	0.60(0.59)	0.99	2805.5	31700.00
4	531.98	26.02	0.654	0.60(0.59)	0.99	3053.4	40430.00
5	528.16	26.60	0.645	0.60(0.59)	0.99	3124.2	40440.00
6	510.63	29.12	0.606	0.60(0.59)	0.99	3431.1	40420.00
7	509.25	29.33	0.603	0.60(0.59)	0.99	3455.7	40400.00
8	507.43	29.58	0.599	0.60(0.59)	0.99	3485.1	40410.00
9	502.48	29.78	0.596	0.60(0.59)	0.99	3508.7	31800.00
10	499.79	29.89	0.595	0.60(0.59)	0.99	3522.5	40300.00
11	473.97	30.84	0.586	0.60(0.59)	0.99	3638.2	31710.00
12	450.26	34.68	0.555	0.60(0.59)	0.99	4108.2	40200.00
13	450.32	35.12	0.551	0.60(0.59)	0.99	4170.5	31810.00
14	474.62	66.41	0.387	0.60(0.59)	0.99	8587.0	40100.00
15	521.49	79.54	0.364	0.60(0.59)	0.99	10319.5	11831.00
16	632.02	104.26	0.317	0.60(0.60)	0.99	14014.6	11530.00
17	726.79	124.82	0.282	0.60(0.60)	0.99	18171.4	11000.00
18	846.04	148.26	0.259	0.60(0.60)	0.99	24962.5	10850.00
19	775.57	163.26	0.244	0.60(0.60)	0.99	28310.1	11220.00
20	720.67	174.09	0.234	0.60(0.60)	0.99	30065.3	10910.00
21	574.71	212.74	0.217	0.60(0.60)	0.99	36649.3	12410.00
22	547.59	220.76	0.214	0.60(0.60)	0.99	38062.1	10600.00
23	542.36	245.14	0.206	0.60(0.59)	0.99	42727.6	12261.00
24	532.18	257.86	0.202	0.60(0.59)	0.99	44212.3	10410.00
25	522.10	269.85	0.198	0.60(0.59)	0.99	45318.1	12101.10
26	510.56	279.41	0.194	0.60(0.59)	0.99	46147.7	10700.00
27	499.34	296.83	0.188	0.60(0.59)	0.99	47695.9	10200.00
28	487.56	309.99	0.184	0.60(0.59)	0.99	48635.5	12010.00
29	476.10	320.09	0.181	0.60(0.60)	0.99	49007.2	10300.00
30	452.28	338.67	0.174	0.60(0.60)	0.99	49312.9	10210.00
31	399.08	386.70	0.164	0.60(0.60)	0.99	49814.7	12000.00
32	368.14	452.96	0.158	0.60(0.60)	0.99	50383.1	10100.00

TOTAL AREA(ACRES) = 50383.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 846.04 Tc(MIN.) = 148.263
EFFECTIVE AREA(ACRES) = 24962.46 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50383.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

****
FLOW PROCESS FROM NODE 12605.60 TO NODE 12606.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 295.00 DOWNSTREAM(FEET) = 286.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1203.43 CHANNEL SLOPE = 0.0075
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 846.04
FLOW VELOCITY(FEET/SEC.) = 8.40 FLOW DEPTH(FEET) = 5.79
TRAVEL TIME(MIN.) = 2.39 Tc(MIN.) = 150.65
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	548.94	19.50	0.794	0.60(0.59)	0.99	1975.4	40510.00
2	546.76	21.88	0.736	0.60(0.59)	0.99	2249.3	40500.00
3	536.01	26.83	0.641	0.60(0.59)	0.99	2805.5	31700.00
4	531.98	28.70	0.613	0.60(0.59)	0.99	3053.4	40430.00
5	528.16	29.28	0.604	0.60(0.59)	0.99	3124.2	40440.00
6	510.63	31.83	0.578	0.60(0.59)	0.99	3431.1	40420.00
7	509.25	32.04	0.576	0.60(0.59)	0.99	3455.7	40400.00
8	507.43	32.29	0.574	0.60(0.59)	0.99	3485.1	40410.00
9	502.48	32.50	0.572	0.60(0.59)	0.99	3508.7	31800.00
10	499.79	32.62	0.572	0.60(0.59)	0.99	3522.5	40300.00
11	473.97	33.60	0.563	0.60(0.59)	0.99	3638.2	31710.00
12	450.26	37.47	0.532	0.60(0.59)	0.99	4108.2	40200.00
13	450.32	37.91	0.528	0.60(0.59)	0.99	4170.5	31810.00
14	474.62	69.17	0.382	0.60(0.59)	0.99	8587.0	40100.00
15	521.49	82.23	0.359	0.60(0.59)	0.99	10319.5	11831.00
16	632.02	106.83	0.312	0.60(0.60)	0.99	14014.6	11530.00
17	726.79	127.30	0.280	0.60(0.60)	0.99	18171.4	11000.00
18	846.04	150.65	0.257	0.60(0.60)	0.99	24962.5	10850.00
19	775.57	165.70	0.242	0.60(0.60)	0.99	28310.1	11220.00
20	720.67	176.57	0.231	0.60(0.60)	0.99	30065.3	10910.00
21	574.71	215.37	0.216	0.60(0.60)	0.99	36649.3	12410.00
22	547.59	223.42	0.213	0.60(0.60)	0.99	38062.1	10600.00
23	542.36	247.81	0.205	0.60(0.59)	0.99	42727.6	12261.00
24	532.18	260.54	0.201	0.60(0.59)	0.99	44212.3	10410.00
25	522.10	272.54	0.197	0.60(0.59)	0.99	45318.1	12101.10
26	510.56	282.12	0.193	0.60(0.59)	0.99	46147.7	10700.00
27	499.34	299.56	0.187	0.60(0.59)	0.99	47695.9	10200.00
28	487.56	312.73	0.183	0.60(0.59)	0.99	48635.5	12010.00
29	476.10	322.85	0.180	0.60(0.60)	0.99	49007.2	10300.00
30	452.28	341.46	0.173	0.60(0.60)	0.99	49312.9	10210.00
31	399.08	389.58	0.164	0.60(0.60)	0.99	49814.7	12000.00
32	368.14	455.90	0.158	0.60(0.60)	0.99	50383.1	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 846.04 Tc(MIN.) = 150.65
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24962.46

****
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
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****
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1

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  >>>>>DEFINE MEMORY BANK # 1 <<<<<
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  PEAK FLOWRATE TABLE FILE NAME: 0610406T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       10.78   28.95  0.60( 0.60) 0.99     135.0   40600.00
    TOTAL AREA(ACRES) =      135.0

********************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE =  11
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  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      548.94   19.50    0.794  0.60( 0.59) 0.99    1975.4   40510.00
      2      546.76   21.88    0.736  0.60( 0.59) 0.99    2249.3   40500.00
      3      536.01   26.83    0.641  0.60( 0.59) 0.99    2805.5   31700.00
      4      531.98   28.70    0.613  0.60( 0.59) 0.99    3053.4   40430.00
      5      528.16   29.28    0.604  0.60( 0.59) 0.99    3124.2   40440.00
      6      510.63   31.83    0.578  0.60( 0.59) 0.99    3431.1   40420.00
      7      509.25   32.04    0.576  0.60( 0.59) 0.99    3455.7   40400.00
      8      507.43   32.29    0.574  0.60( 0.59) 0.99    3485.1   40410.00
      9      502.48   32.50    0.572  0.60( 0.59) 0.99    3508.7   31800.00
     10      499.79   32.62    0.572  0.60( 0.59) 0.99    3522.5   40300.00
     11      473.97   33.60    0.563  0.60( 0.59) 0.99    3638.2   31710.00
     12      450.26   37.47    0.532  0.60( 0.59) 0.99    4108.2   40200.00
     13      450.32   37.91    0.528  0.60( 0.59) 0.99    4170.5   31810.00
     14      474.62   69.17    0.382  0.60( 0.59) 0.99    8587.0   40100.00
     15      521.49   82.23    0.359  0.60( 0.59) 0.99   10319.5   11831.00
     16      632.02  106.83    0.312  0.60( 0.60) 0.99   14014.6   11530.00
     17      726.79  127.30    0.280  0.60( 0.60) 0.99   18171.4   11000.00
     18      846.04  150.65    0.257  0.60( 0.60) 0.99   24962.5   10850.00
     19      775.57  165.70    0.242  0.60( 0.60) 0.99   28310.1   11220.00
     20      720.67  176.57    0.231  0.60( 0.60) 0.99   30065.3   10910.00
     21      574.71  215.37    0.216  0.60( 0.60) 0.99   36649.3   12410.00
     22      547.59  223.42    0.213  0.60( 0.60) 0.99   38062.1   10600.00
     23      542.36  247.81    0.205  0.60( 0.59) 0.99   42727.6   12261.00
     24      532.18  260.54    0.201  0.60( 0.59) 0.99   44212.3   10410.00
     25      522.10  272.54    0.197  0.60( 0.59) 0.99   45318.1   12101.10
     26      510.56  282.12    0.193  0.60( 0.59) 0.99   46147.7   10700.00
     27      499.34  299.56    0.187  0.60( 0.59) 0.99   47695.9   10200.00
     28      487.56  312.73    0.183  0.60( 0.59) 0.99   48635.5   12010.00
     29      476.10  322.85    0.180  0.60( 0.60) 0.99   49007.2   10300.00
     30      452.28  341.46    0.173  0.60( 0.60) 0.99   49312.9   10210.00
     31      399.08  389.58    0.164  0.60( 0.60) 0.99   49814.7   12000.00
     32      368.14  455.90    0.158  0.60( 0.60) 0.99   50383.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.78   28.95    0.609  0.60( 0.60) 0.99     135.0   40600.00
  LONGEST FLOWPATH FROM NODE  40600.00 TO NODE  12606.00 =    6107.00 FEET.

                Date: 07/19/2018        File name: RE2-S26.RES          Page 19
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  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      559.72   19.50    0.794  0.60( 0.59) 0.99    2066.3   40510.00
      2      557.54   21.88    0.736  0.60( 0.59) 0.99    2351.3   40500.00
      3      546.79   26.83    0.641  0.60( 0.59) 0.99    2930.6   31700.00
      4      542.76   28.70    0.613  0.60( 0.59) 0.99    3187.2   40430.00
      5      541.11   28.95    0.609  0.60( 0.59) 0.99    3219.0   40600.00
      6      534.52   29.28    0.604  0.60( 0.59) 0.99    3259.1   40440.00
      7      513.28   31.83    0.578  0.60( 0.59) 0.99    3566.1   40420.00
      8      511.89   32.04    0.576  0.60( 0.59) 0.99    3590.7   40400.00
      9      510.06   32.29    0.574  0.60( 0.59) 0.99    3620.1   40410.00
     10      505.10   32.50    0.572  0.60( 0.59) 0.99    3643.6   31800.00
     11      502.41   32.62    0.572  0.60( 0.59) 0.99    3657.5   40300.00
     12      476.55   33.60    0.563  0.60( 0.59) 0.99    3773.1   31710.00
     13      452.70   37.47    0.532  0.60( 0.59) 0.99    4243.2   40200.00
     14      452.74   37.91    0.528  0.60( 0.59) 0.99    4305.5   31810.00
     15      476.37   69.17    0.382  0.60( 0.59) 0.99    8722.0   40100.00
     16      523.14   82.23    0.359  0.60( 0.59) 0.99   10454.5   11831.00
     17      633.45  106.83    0.312  0.60( 0.60) 0.99   14149.6   11530.00
     18      728.07  127.30    0.280  0.60( 0.60) 0.99   18306.4   11000.00
     19      847.22  150.65    0.257  0.60( 0.60) 0.99   25097.4   10850.00
     20      776.68  165.70    0.242  0.60( 0.60) 0.99   28445.1   11220.00
     21      721.73  176.57    0.231  0.60( 0.60) 0.99   30200.3   10910.00
     22      575.70  215.37    0.216  0.60( 0.60) 0.99   36784.2   12410.00
     23      548.57  223.42    0.213  0.60( 0.60) 0.99   38197.1   10600.00
     24      543.30  247.81    0.205  0.60( 0.59) 0.99   42862.5   12261.00
     25      533.10  260.54    0.201  0.60( 0.59) 0.99   44347.3   10410.00
     26      523.01  272.54    0.197  0.60( 0.59) 0.99   45453.1   12101.10
     27      511.45  282.12    0.193  0.60( 0.59) 0.99   46282.7   10700.00
     28      500.20  299.56    0.187  0.60( 0.59) 0.99   47830.8   10200.00
     29      488.39  312.73    0.183  0.60( 0.59) 0.99   48770.5   12010.00
     30      476.93  322.85    0.180  0.60( 0.60) 0.99   49142.2   10300.00
     31      453.08  341.46    0.173  0.60( 0.60) 0.99   49447.9   10210.00
     32      399.84  389.58    0.164  0.60( 0.60) 0.99   49949.6   12000.00
     33      368.86  455.90    0.158  0.60( 0.60) 0.99   50518.0   10100.00
    TOTAL AREA(ACRES) =     50518.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      847.22  Tc(MIN.) =  150.650
  EFFECTIVE AREA(ACRES) =  25097.44  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    50518.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    50518.0  TC(MIN.) =    150.65
  EFFECTIVE AREA(ACRES) =  25097.44  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.995
  PEAK FLOW RATE(CFS)   =     847.22

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      559.72   19.50    0.794  0.60( 0.59) 0.99    2066.3   40510.00
      2      557.54   21.88    0.736  0.60( 0.59) 0.99    2351.3   40500.00
      3      546.79   26.83    0.641  0.60( 0.59) 0.99    2930.6   31700.00

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4	542.76	28.70	0.613	0.60(0.59)	0.99	3187.2	40430.00
5	541.11	28.95	0.609	0.60(0.59)	0.99	3219.0	40600.00
6	534.52	29.28	0.604	0.60(0.59)	0.99	3259.1	40440.00
7	513.28	31.83	0.578	0.60(0.59)	0.99	3566.1	40420.00
8	511.89	32.04	0.576	0.60(0.59)	0.99	3590.7	40400.00
9	510.06	32.29	0.574	0.60(0.59)	0.99	3620.1	40410.00
10	505.10	32.50	0.572	0.60(0.59)	0.99	3643.6	31800.00
11	502.41	32.62	0.572	0.60(0.59)	0.99	3657.5	40300.00
12	476.55	33.60	0.563	0.60(0.59)	0.99	3773.1	31710.00
13	452.70	37.47	0.532	0.60(0.59)	0.99	4243.2	40200.00
14	452.74	37.91	0.528	0.60(0.59)	0.99	4305.5	31810.00
15	476.37	69.17	0.382	0.60(0.59)	0.99	8722.0	40100.00
16	523.14	82.23	0.359	0.60(0.59)	0.99	10454.5	11831.00
17	633.45	106.83	0.312	0.60(0.60)	0.99	14149.6	11530.00
18	728.07	127.30	0.280	0.60(0.60)	0.99	18306.4	11000.00
19	847.22	150.65	0.257	0.60(0.60)	0.99	25097.4	10850.00
20	776.68	165.70	0.242	0.60(0.60)	0.99	28445.1	11220.00
21	721.73	176.57	0.231	0.60(0.60)	0.99	30200.3	10910.00
22	575.70	215.37	0.216	0.60(0.60)	0.99	36784.2	12410.00
23	548.57	223.42	0.213	0.60(0.60)	0.99	38197.1	10600.00
24	543.30	247.81	0.205	0.60(0.59)	0.99	42862.5	12261.00
25	533.10	260.54	0.201	0.60(0.59)	0.99	44347.3	10410.00
26	523.01	272.54	0.197	0.60(0.59)	0.99	45453.1	12101.10
27	511.45	282.12	0.193	0.60(0.59)	0.99	46282.7	10700.00
28	500.20	299.56	0.187	0.60(0.59)	0.99	47830.8	10200.00
29	488.39	312.73	0.183	0.60(0.59)	0.99	48770.5	12010.00
30	476.93	322.85	0.180	0.60(0.60)	0.99	49142.2	10300.00
31	453.08	341.46	0.173	0.60(0.60)	0.99	49447.9	10210.00
32	399.84	389.58	0.164	0.60(0.60)	0.99	49949.6	12000.00
33	368.86	455.90	0.158	0.60(0.60)	0.99	50518.0	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S27.DAT
  TIME/DATE OF STUDY: 07:51 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.859
   2)   10.00;  1.240
   3)   15.00;  0.945
   4)   20.00;  0.774
   5)   25.00;  0.667
   6)   30.00;  0.591
   7)   40.00;  0.510
   8)   50.00;  0.453
   9)   60.00;  0.397
  10)   90.00;  0.337
  11)  120.00;  0.277
  12)  180.00;  0.217
  13)  360.00;  0.157
  14) 1200.00;  0.083
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S26.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      559.72   19.50  0.60( 0.59) 0.99    2066.3   40510.00
      2      452.74   37.91  0.60( 0.59) 0.99    4305.5   31810.00
      3      476.37   69.17  0.60( 0.59) 0.99    8722.0   40100.00
      4      523.14   82.23  0.60( 0.59) 0.99   10454.5   11831.00
      5      633.45  106.83  0.60( 0.60) 0.99   14149.6   11530.00
      6      728.07  127.30  0.60( 0.60) 0.99   18306.4   11000.00
      7      847.22  150.65  0.60( 0.60) 0.99   25097.4   10850.00
      8      776.68  165.70  0.60( 0.60) 0.99   28445.1   11220.00
      9      721.73  176.57  0.60( 0.60) 0.99   30200.3   10910.00
     10      575.70  215.37  0.60( 0.60) 0.99   36784.2   12410.00
     11      543.30  247.81  0.60( 0.59) 0.99   42862.5   12261.00
     12      533.10  260.54  0.60( 0.59) 0.99   44347.3   10410.00
     13      523.01  272.54  0.60( 0.59) 0.99   45453.1   12101.10
     14      511.45  282.12  0.60( 0.59) 0.99   46282.7   10700.00
     15      500.20  299.56  0.60( 0.59) 0.99   47830.8   10200.00
     16      488.39  312.73  0.60( 0.59) 0.99   48770.5   12010.00
     17      476.93  322.85  0.60( 0.60) 0.99   49142.2   10300.00
     18      453.08  341.46  0.60( 0.60) 0.99   49447.9   10210.00
     19      399.84  389.58  0.60( 0.60) 0.99   49949.6   12000.00
     20      368.86  455.90  0.60( 0.60) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =    50518.0

**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      559.72   19.50  0.60( 0.59) 0.99    2066.3   40510.00
      2      452.74   37.91  0.60( 0.59) 0.99    4305.5   31810.00
      3      476.37   69.17  0.60( 0.59) 0.99    8722.0   40100.00
      4      523.14   82.23  0.60( 0.59) 0.99   10454.5   11831.00
      5      633.45  106.83  0.60( 0.60) 0.99   14149.6   11530.00
      6      728.07  127.30  0.60( 0.60) 0.99   18306.4   11000.00
      7      847.22  150.65  0.60( 0.60) 0.99   25097.4   10850.00
      8      776.68  165.70  0.60( 0.60) 0.99   28445.1   11220.00
      9      721.73  176.57  0.60( 0.60) 0.99   30200.3   10910.00
     10      575.70  215.37  0.60( 0.60) 0.99   36784.2   12410.00
     11      543.30  247.81  0.60( 0.59) 0.99   42862.5   12261.00
     12      533.10  260.54  0.60( 0.59) 0.99   44347.3   10410.00
     13      523.01  272.54  0.60( 0.59) 0.99   45453.1   12101.10
     14      511.45  282.12  0.60( 0.59) 0.99   46282.7   10700.00
     15      500.20  299.56  0.60( 0.59) 0.99   47830.8   10200.00
     16      488.39  312.73  0.60( 0.59) 0.99   48770.5   12010.00
     17      476.93  322.85  0.60( 0.60) 0.99   49142.2   10300.00
     18      453.08  341.46  0.60( 0.60) 0.99   49447.9   10210.00
```

```
     19      399.84  389.58  0.60( 0.60) 0.99   49949.6   12000.00
     20      368.86  455.90  0.60( 0.60) 0.99   50518.0   10100.00
    TOTAL AREA(ACRES) =     50518.0

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12701.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    286.00  DOWNSTREAM(FEET) =    276.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.19   CHANNEL SLOPE =  0.0079
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.244
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.55      0.60     0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     847.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.59
  AVERAGE FLOW DEPTH(FEET) =   5.73   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =  153.09
  SUBAREA AREA(ACRES) =     7.55       SUBAREA RUNOFF(CFS) =    0.18
  EFFECTIVE AREA(ACRES) =  25104.99     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    50525.6         PEAK FLOW RATE(CFS) =     847.22
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.73   FLOW VELOCITY(FEET/SEC.) =   8.59
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12701.00 =  105865.19 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      559.72   22.21    0.727  0.60( 0.59) 0.99    2073.9   40510.00
      2      452.74   40.78    0.506  0.60( 0.59) 0.99    4313.0   31810.00
      3      476.37   71.99    0.373  0.60( 0.59) 0.99    8729.6   40100.00
      4      523.14   84.99    0.347  0.60( 0.59) 0.99   10462.0   11831.00
      5      633.45  109.45    0.298  0.60( 0.60) 0.99   14157.2   11530.00
      6      728.07  129.84    0.267  0.60( 0.60) 0.99   18313.9   11000.00
      7      847.22  153.09    0.244  0.60( 0.60) 0.99   25105.0   10850.00
      8      776.68  168.20    0.229  0.60( 0.60) 0.99   28452.6   11220.00
      9      721.73  179.11    0.218  0.60( 0.60) 0.99   30207.8   10910.00
     10      575.70  218.05    0.204  0.60( 0.60) 0.99   36791.8   12410.00
     11      543.30  250.54    0.193  0.60( 0.59) 0.99   42870.1   12261.00
     12      533.10  263.28    0.189  0.60( 0.59) 0.99   44354.8   10410.00
     13      523.01  275.30    0.185  0.60( 0.59) 0.99   45460.6   12101.10
     14      511.45  284.89    0.182  0.60( 0.59) 0.99   46290.2   10700.00
     15      500.20  302.35    0.176  0.60( 0.59) 0.99   47838.4   10200.00
     16      488.39  315.54    0.172  0.60( 0.59) 0.99   48778.1   12010.00
```



```
     17      476.93  325.67    0.168  0.60( 0.60) 0.99   49149.7   10300.00
     18      453.08  344.32    0.162  0.60( 0.60) 0.99   49455.5   10210.00
     19      399.84  392.53    0.154  0.60( 0.60) 0.99   49957.2   12000.00
     20      368.86  458.91    0.148  0.60( 0.60) 0.99   50525.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     847.22  Tc(MIN.) =  153.09
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   25104.99

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    276.00  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   147.65   CHANNEL SLOPE =  0.0068
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.244
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        1.49      0.60     0.972     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.972
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     847.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.11
  AVERAGE FLOW DEPTH(FEET) =   5.90   TRAVEL TIME(MIN.) =   0.30
  Tc(MIN.) =  153.40
  SUBAREA AREA(ACRES) =     1.49       SUBAREA RUNOFF(CFS) =    0.01
  EFFECTIVE AREA(ACRES) =  25106.48     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    50527.1         PEAK FLOW RATE(CFS) =     847.22
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.90   FLOW VELOCITY(FEET/SEC.) =   8.11
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      559.72   22.55    0.719  0.60( 0.59) 0.99    2075.4   40510.00
      2      452.74   41.13    0.504  0.60( 0.59) 0.99    4314.5   31810.00
      3      476.37   72.34    0.372  0.60( 0.59) 0.99    8731.1   40100.00
      4      523.14   85.33    0.346  0.60( 0.59) 0.99   10463.5   11831.00
      5      633.45  109.78    0.297  0.60( 0.60) 0.99   14158.7   11530.00
      6      728.07  130.15    0.267  0.60( 0.60) 0.99   18315.4   11000.00
      7      847.22  153.40    0.244  0.60( 0.60) 0.99   25106.5   10850.00
      8      776.68  168.51    0.228  0.60( 0.60) 0.99   28454.1   11220.00
      9      721.73  179.43    0.218  0.60( 0.60) 0.99   30209.3   10910.00
     10      575.70  218.39    0.204  0.60( 0.60) 0.99   36793.3   12410.00
     11      543.30  250.88    0.193  0.60( 0.59) 0.99   42871.6   12261.00
```

```
    12      533.10  263.62    0.189  0.60( 0.59) 0.99   44356.3   10410.00
    13      523.01  275.64    0.185  0.60( 0.59) 0.99   45462.1   12101.10
    14      511.45  285.23    0.182  0.60( 0.59) 0.99   46291.7   10700.00
    15      500.20  302.69    0.176  0.60( 0.59) 0.99   47839.9   10200.00
    16      488.39  315.89    0.172  0.60( 0.59) 0.99   48779.5   12010.00
    17      476.93  326.02    0.168  0.60( 0.60) 0.99   49151.2   10300.00
    18      453.08  344.68    0.162  0.60( 0.60) 0.99   49457.0   10210.00
    19      399.84  392.89    0.154  0.60( 0.60) 0.99   49958.7   12000.00
    20      368.86  459.28    0.148  0.60( 0.60) 0.99   50527.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     847.22  Tc(MIN.) =  153.40
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   25106.48

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  153.40
  RAINFALL INTENSITY(INCH/HR) =   0.24
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =   25106.48
  TOTAL STREAM AREA(ACRES) =   50527.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     847.22

****************************************************************************
  FLOW PROCESS FROM NODE  12710.00 TO NODE  12711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.56
  ELEVATION DATA: UPSTREAM(FEET) =    940.78  DOWNSTREAM(FEET) =    657.79

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.910
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.009
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.56      0.60     1.000     0   13.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.42
  TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =      2.42

****************************************************************************
  FLOW PROCESS FROM NODE  12711.00 TO NODE  12712.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    657.79  DOWNSTREAM(FEET) =    585.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =   766.00   CHANNEL SLOPE =  0.0942
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.863
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.94      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.67
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   17.38
  SUBAREA AREA(ACRES) =    26.94       SUBAREA RUNOFF(CFS) =    6.39
  EFFECTIVE AREA(ACRES) =     33.50     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.5         PEAK FLOW RATE(CFS) =       7.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   4.02
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12712.00 =    1709.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12712.00 TO NODE  12713.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.63  DOWNSTREAM(FEET) =    463.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.79   CHANNEL SLOPE =  0.1188
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.749
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.73      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.53
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   3.78
  Tc(MIN.) =   21.16
  SUBAREA AREA(ACRES) =    14.73       SUBAREA RUNOFF(CFS) =    1.98
  EFFECTIVE AREA(ACRES) =     48.23     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       48.2         PEAK FLOW RATE(CFS) =       7.95
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   4.41
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12713.00 =    2735.35 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12713.00 TO NODE  12714.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    463.75  DOWNSTREAM(FEET) =    360.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1148.54   CHANNEL SLOPE =  0.0901
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.657
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.64      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.28
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   4.47
  Tc(MIN.) =   25.63
  SUBAREA AREA(ACRES) =   105.64       SUBAREA RUNOFF(CFS) =    5.47
  EFFECTIVE AREA(ACRES) =    153.87     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      153.9         PEAK FLOW RATE(CFS) =       7.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.82   FLOW VELOCITY(FEET/SEC.) =   3.96
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12714.00 =    3883.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    360.30  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1314.99   CHANNEL SLOPE =  0.0649
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.575
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.13      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.49
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   6.29
  Tc(MIN.) =   31.92
  SUBAREA AREA(ACRES) =   127.13       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    281.00     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      281.0         PEAK FLOW RATE(CFS) =       7.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```



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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   3.49
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12720.00 =    5198.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.92
  RAINFALL INTENSITY(INCH/HR) =   0.58
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     281.00
  TOTAL STREAM AREA(ACRES) =     281.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.97

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      559.72   22.55    0.719  0.60( 0.59) 0.99    2075.4   40510.00
      1      452.74   41.13    0.504  0.60( 0.59) 0.99    4314.5   31810.00
      1      476.37   72.34    0.372  0.60( 0.59) 0.99    8731.1   40100.00
      1      523.14   85.33    0.346  0.60( 0.59) 0.99   10463.5   11831.00
      1      633.45  109.78    0.297  0.60( 0.60) 0.99   14158.7   11530.00
      1      728.07  130.15    0.267  0.60( 0.60) 0.99   18315.4   11000.00
      1      847.22  153.40    0.244  0.60( 0.60) 0.99   25106.5   10850.00
      1      776.68  168.51    0.228  0.60( 0.60) 0.99   28454.1   11220.00
      1      721.73  179.43    0.218  0.60( 0.60) 0.99   30209.3   10910.00
      1      575.70  218.39    0.204  0.60( 0.60) 0.99   36793.3   12410.00
      1      543.30  250.88    0.193  0.60( 0.59) 0.99   42871.6   12261.00
      1      533.10  263.62    0.189  0.60( 0.59) 0.99   44356.3   10410.00
      1      523.01  275.64    0.185  0.60( 0.59) 0.99   45462.1   12101.10
      1      511.45  285.23    0.182  0.60( 0.59) 0.99   46291.7   10700.00
      1      500.20  302.69    0.176  0.60( 0.59) 0.99   47839.9   10200.00
      1      488.39  315.89    0.172  0.60( 0.59) 0.99   48779.5   12010.00
      1      476.93  326.02    0.168  0.60( 0.60) 0.99   49151.2   10300.00
      1      453.08  344.68    0.162  0.60( 0.60) 0.99   49457.0   10210.00
      1      399.84  392.89    0.154  0.60( 0.60) 0.99   49958.7   12000.00
      1      368.86  459.28    0.148  0.60( 0.60) 0.99   50527.1   10100.00
      2        7.97   31.92    0.575  0.60( 0.60) 1.00     281.0   12710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      566.76   22.55    0.719  0.60( 0.59) 0.99    2273.9   40510.00
      2      513.74   31.92    0.575  0.60( 0.59) 0.99    3485.4   12710.00
      3      459.71   41.13    0.504  0.60( 0.59) 0.99    4595.5   31810.00
      4      481.52   72.34    0.372  0.60( 0.59) 0.99    9012.1   40100.00
      5      527.93   85.33    0.346  0.60( 0.60) 0.99   10744.5   11831.00
      6      637.57  109.78    0.297  0.60( 0.60) 0.99   14439.7   11530.00
```

```
      7      731.77  130.15    0.267  0.60( 0.60) 0.99   18596.4   11000.00
      8      850.59  153.40    0.244  0.60( 0.60) 0.99   25387.5   10850.00
      9      779.84  168.51    0.228  0.60( 0.60) 0.99   28735.1   11220.00
     10      724.74  179.43    0.218  0.60( 0.60) 0.99   30490.3   10910.00
     11      578.53  218.39    0.204  0.60( 0.60) 0.99   37074.3   12410.00
     12      545.98  250.88    0.193  0.60( 0.59) 0.99   43152.6   12261.00
     13      535.72  263.62    0.189  0.60( 0.59) 0.99   44637.3   10410.00
     14      525.57  275.64    0.185  0.60( 0.59) 0.99   45743.1   12101.10
     15      513.96  285.23    0.182  0.60( 0.59) 0.99   46572.7   10700.00
     16      502.64  302.69    0.176  0.60( 0.59) 0.99   48120.9   10200.00
     17      490.77  315.89    0.172  0.60( 0.60) 0.99   49060.5   12010.00
     18      479.26  326.02    0.168  0.60( 0.60) 0.99   49432.2   10300.00
     19      455.32  344.68    0.162  0.60( 0.60) 0.99   49738.0   10210.00
     20      401.97  392.89    0.154  0.60( 0.60) 0.99   50239.7   12000.00
     21      370.92  459.28    0.148  0.60( 0.60) 0.99   50808.1   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     850.59    Tc(MIN.) =   153.40
  EFFECTIVE AREA(ACRES) =   25387.48   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    50808.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================
  ***MEMORY BANK #  2 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610316T.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        9.75   40.03  0.60( 0.59) 0.98     231.4   31600.00
    TOTAL AREA(ACRES) =      231.4

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      566.76   22.55    0.719  0.60( 0.59) 0.99    2273.9   40510.00
      2      513.74   31.92    0.575  0.60( 0.59) 0.99    3485.4   12710.00
      3      459.71   41.13    0.504  0.60( 0.59) 0.99    4595.5   31810.00
      4      481.52   72.34    0.372  0.60( 0.59) 0.99    9012.1   40100.00
      5      527.93   85.33    0.346  0.60( 0.60) 0.99   10744.5   11831.00
      6      637.57  109.78    0.297  0.60( 0.60) 0.99   14439.7   11530.00
      7      731.77  130.15    0.267  0.60( 0.60) 0.99   18596.4   11000.00
```



```
      8      850.59  153.40    0.244  0.60( 0.60) 0.99   25387.5   10850.00
      9      779.84  168.51    0.228  0.60( 0.60) 0.99   28735.1   11220.00
     10      724.74  179.43    0.218  0.60( 0.60) 0.99   30490.3   10910.00
     11      578.53  218.39    0.204  0.60( 0.60) 0.99   37074.3   12410.00
     12      545.98  250.88    0.193  0.60( 0.59) 0.99   43152.6   12261.00
     13      535.72  263.62    0.189  0.60( 0.59) 0.99   44637.3   10410.00
     14      525.57  275.64    0.185  0.60( 0.59) 0.99   45743.1   12101.10
     15      513.96  285.23    0.182  0.60( 0.59) 0.99   46572.7   10700.00
     16      502.64  302.69    0.176  0.60( 0.59) 0.99   48120.9   10200.00
     17      490.77  315.89    0.172  0.60( 0.60) 0.99   49060.5   12010.00
     18      479.26  326.02    0.168  0.60( 0.60) 0.99   49432.2   10300.00
     19      455.32  344.68    0.162  0.60( 0.60) 0.99   49738.0   10210.00
     20      401.97  392.89    0.154  0.60( 0.60) 0.99   50239.7   12000.00
     21      370.92  459.28    0.148  0.60( 0.60) 0.99   50808.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        9.75   40.03    0.510  0.60( 0.59) 0.98     231.4   31600.00
  LONGEST FLOWPATH FROM NODE  31600.00 TO NODE  12720.00 =    7759.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      574.51   22.55    0.719  0.60( 0.59) 0.99    2404.2   40510.00
      2      522.52   31.92    0.575  0.60( 0.59) 0.99    3669.9   12710.00
      3      475.90   40.03    0.510  0.60( 0.59) 0.99    4694.6   31600.00
      4      469.34   41.13    0.504  0.60( 0.59) 0.99    4826.9   31810.00
      5      488.64   72.34    0.372  0.60( 0.59) 0.99    9243.5   40100.00
      6      534.55   85.33    0.346  0.60( 0.59) 0.99   10975.9   11831.00
      7      643.26  109.78    0.297  0.60( 0.60) 0.99   14671.0   11530.00
      8      736.87  130.15    0.267  0.60( 0.60) 0.99   18827.8   11000.00
      9      855.25  153.40    0.244  0.60( 0.60) 0.99   25618.9   10850.00
     10      784.21  168.51    0.228  0.60( 0.60) 0.99   28966.5   11220.00
     11      728.90  179.43    0.218  0.60( 0.60) 0.99   30721.7   10910.00
     12      582.43  218.39    0.204  0.60( 0.60) 0.99   37305.7   12410.00
     13      549.68  250.88    0.193  0.60( 0.59) 0.99   43384.0   12261.00
     14      539.34  263.62    0.189  0.60( 0.59) 0.99   44868.7   10410.00
     15      529.11  275.64    0.185  0.60( 0.59) 0.99   45974.5   12101.10
     16      517.44  285.23    0.182  0.60( 0.59) 0.99   46804.1   10700.00
     17      506.00  302.69    0.176  0.60( 0.59) 0.99   48352.3   10200.00
     18      494.06  315.89    0.172  0.60( 0.59) 0.99   49291.9   12010.00
     19      482.48  326.02    0.168  0.60( 0.60) 0.99   49663.6   10300.00
     20      458.42  344.68    0.162  0.60( 0.60) 0.99   49969.3   10210.00
     21      404.92  392.89    0.154  0.60( 0.60) 0.99   50471.1   12000.00
     22      373.75  459.28    0.148  0.60( 0.60) 0.99   51039.5   10100.00
    TOTAL AREA(ACRES) =     51039.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      855.25  Tc(MIN.) =  153.398
  EFFECTIVE AREA(ACRES) =  25618.87  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51039.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.50 IS CODE =  51
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    275.00  DOWNSTREAM(FEET) =    258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2669.21   CHANNEL SLOPE =  0.0064
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     855.25
  FLOW VELOCITY(FEET/SEC.) =   7.94   FLOW DEPTH(FEET) =   5.99
  TRAVEL TIME(MIN.) =   5.61   Tc(MIN.) =  159.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      574.51   28.74    0.610  0.60( 0.59) 0.99    2404.2   40510.00
      2      522.52   38.27    0.524  0.60( 0.59) 0.99    3669.9   12710.00
      3      475.90   46.52    0.473  0.60( 0.59) 0.99    4694.6   31600.00
      4      469.34   47.65    0.466  0.60( 0.59) 0.99    4826.9   31810.00
      5      488.64   78.78    0.359  0.60( 0.59) 0.99    9243.5   40100.00
      6      534.55   91.64    0.334  0.60( 0.59) 0.99   10975.9   11831.00
      7      643.26  115.81    0.285  0.60( 0.60) 0.99   14671.0   11530.00
      8      736.87  135.97    0.261  0.60( 0.60) 0.99   18827.8   11000.00
      9      855.25  159.00    0.238  0.60( 0.60) 0.99   25618.9   10850.00
     10      784.21  174.24    0.223  0.60( 0.60) 0.99   28966.5   11220.00
     11      728.90  185.26    0.215  0.60( 0.60) 0.99   30721.7   10910.00
     12      582.43  224.56    0.202  0.60( 0.60) 0.99   37305.7   12410.00
     13      549.68  257.14    0.191  0.60( 0.59) 0.99   43384.0   12261.00
     14      539.34  269.91    0.187  0.60( 0.59) 0.99   44868.7   10410.00
     15      529.11  281.97    0.183  0.60( 0.59) 0.99   45974.5   12101.10
     16      517.44  291.59    0.180  0.60( 0.59) 0.99   46804.1   10700.00
     17      506.00  309.09    0.174  0.60( 0.59) 0.99   48352.3   10200.00
     18      494.06  322.32    0.170  0.60( 0.59) 0.99   49291.9   12010.00
     19      482.48  332.49    0.166  0.60( 0.60) 0.99   49663.6   10300.00
     20      458.42  351.22    0.160  0.60( 0.60) 0.99   49969.3   10210.00
     21      404.92  399.65    0.154  0.60( 0.60) 0.99   50471.1   12000.00
     22      373.75  466.19    0.148  0.60( 0.60) 0.99   51039.5   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     855.25  Tc(MIN.) =  159.00
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   25618.87

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610315T.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
```



```
      1        6.20   34.15  0.60( 0.50) 0.83      68.1   31500.00
    TOTAL AREA(ACRES) =       68.1

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      574.51   28.74    0.610  0.60( 0.59) 0.99    2404.2   40510.00
      2      522.52   38.27    0.524  0.60( 0.59) 0.99    3669.9   12710.00
      3      475.90   46.52    0.473  0.60( 0.59) 0.99    4694.6   31600.00
      4      469.34   47.65    0.466  0.60( 0.59) 0.99    4826.9   31810.00
      5      488.64   78.78    0.359  0.60( 0.59) 0.99    9243.5   40100.00
      6      534.55   91.64    0.334  0.60( 0.59) 0.99   10975.9   11831.00
      7      643.26  115.81    0.285  0.60( 0.60) 0.99   14671.0   11530.00
      8      736.87  135.97    0.261  0.60( 0.60) 0.99   18827.8   11000.00
      9      855.25  159.00    0.238  0.60( 0.60) 0.99   25618.9   10850.00
     10      784.21  174.24    0.223  0.60( 0.60) 0.99   28966.5   11220.00
     11      728.90  185.26    0.215  0.60( 0.60) 0.99   30721.7   10910.00
     12      582.43  224.56    0.202  0.60( 0.60) 0.99   37305.7   12410.00
     13      549.68  257.14    0.191  0.60( 0.59) 0.99   43384.0   12261.00
     14      539.34  269.91    0.187  0.60( 0.59) 0.99   44868.7   10410.00
     15      529.11  281.97    0.183  0.60( 0.59) 0.99   45974.5   12101.10
     16      517.44  291.59    0.180  0.60( 0.59) 0.99   46804.1   10700.00
     17      506.00  309.09    0.174  0.60( 0.59) 0.99   48352.3   10200.00
     18      494.06  322.32    0.170  0.60( 0.59) 0.99   49291.9   12010.00
     19      482.48  332.49    0.166  0.60( 0.60) 0.99   49663.6   10300.00
     20      458.42  351.22    0.160  0.60( 0.60) 0.99   49969.3   10210.00
     21      404.92  399.65    0.154  0.60( 0.60) 0.99   50471.1   12000.00
     22      373.75  466.19    0.148  0.60( 0.60) 0.99   51039.5   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        6.20   34.15    0.557  0.60( 0.50) 0.83      68.1   31500.00
  LONGEST FLOWPATH FROM NODE  31500.00 TO NODE  12720.50 =    4043.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      580.68   28.74    0.610  0.60( 0.59) 0.99    2461.5   40510.00
      2      551.19   34.15    0.557  0.60( 0.59) 0.99    3191.1   31500.00
      3      528.35   38.27    0.524  0.60( 0.59) 0.99    3738.0   12710.00
      4      481.16   46.52    0.473  0.60( 0.59) 0.99    4762.7   31600.00
      5      474.53   47.65    0.466  0.60( 0.59) 0.99    4895.0   31810.00
      6      492.64   78.78    0.359  0.60( 0.59) 0.99    9311.5   40100.00
      7      538.27   91.64    0.334  0.60( 0.59) 0.99   11044.0   11831.00
      8      646.43  115.81    0.285  0.60( 0.59) 0.99   14739.1   11530.00
      9      739.77  135.97    0.261  0.60( 0.60) 0.99   18895.9   11000.00
     10      857.90  159.00    0.238  0.60( 0.60) 0.99   25687.0   10850.00
     11      786.69  174.24    0.223  0.60( 0.60) 0.99   29034.6   11220.00
     12      731.30  185.26    0.215  0.60( 0.60) 0.99   30789.8   10910.00
     13      584.68  224.56    0.202  0.60( 0.60) 0.99   37373.8   12410.00
```

```
    14      551.81  257.14    0.191  0.60( 0.59) 0.99   43452.1   12261.00
    15      541.42  269.91    0.187  0.60( 0.59) 0.99   44936.8   10410.00
    16      531.14  281.97    0.183  0.60( 0.59) 0.99   46042.6   12101.10
    17      519.44  291.59    0.180  0.60( 0.59) 0.99   46872.2   10700.00
    18      507.94  309.09    0.174  0.60( 0.59) 0.99   48420.4   10200.00
    19      495.94  322.32    0.170  0.60( 0.59) 0.99   49360.0   12010.00
    20      484.33  332.49    0.166  0.60( 0.59) 0.99   49731.7   10300.00
    21      460.20  351.22    0.160  0.60( 0.59) 0.99   50037.4   10210.00
    22      406.62  399.65    0.154  0.60( 0.59) 0.99   50539.2   12000.00
    23      375.39  466.19    0.148  0.60( 0.60) 0.99   51107.6   10100.00
  TOTAL AREA(ACRES) =     51107.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      857.90  Tc(MIN.) =  159.004
 EFFECTIVE AREA(ACRES) =  25686.97  AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    51107.6
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12720.50 TO NODE  12721.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    256.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   438.77   CHANNEL SLOPE =  0.0046
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.237
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       62.15      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     857.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.00
 AVERAGE FLOW DEPTH(FEET) =   6.39   TRAVEL TIME(MIN.) =   1.04
 Tc(MIN.) =  160.05
 SUBAREA AREA(ACRES) =    62.15       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =  25749.12     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =    51169.7         PEAK FLOW RATE(CFS) =     857.90
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.39   FLOW VELOCITY(FEET/SEC.) =   7.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12721.00 =  109120.82 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      580.68   29.89    0.593  0.60( 0.59) 0.99    2523.7   40510.00
```



```
     2      551.19   35.31    0.548  0.60( 0.59) 0.99    3253.2   31500.00
     3      528.35   39.44    0.515  0.60( 0.59) 0.99    3800.2   12710.00
     4      481.16   47.73    0.466  0.60( 0.59) 0.99    4824.9   31600.00
     5      474.53   48.86    0.460  0.60( 0.59) 0.99    4957.2   31810.00
     6      492.64   79.98    0.357  0.60( 0.59) 0.99    9373.7   40100.00
     7      538.27   92.81    0.331  0.60( 0.59) 0.99   11106.2   11831.00
     8      646.43  116.93    0.283  0.60( 0.59) 0.99   14801.3   11530.00
     9      739.77  137.05    0.260  0.60( 0.60) 0.99   18958.0   11000.00
    10      857.90  160.05    0.237  0.60( 0.60) 0.99   25749.1   10850.00
    11      786.69  175.30    0.222  0.60( 0.60) 0.99   29096.8   11220.00
    12      731.30  186.34    0.215  0.60( 0.60) 0.99   30852.0   10910.00
    13      584.68  225.71    0.202  0.60( 0.60) 0.99   37435.9   12410.00
    14      551.81  258.31    0.191  0.60( 0.59) 0.99   43514.2   12261.00
    15      541.42  271.08    0.187  0.60( 0.59) 0.99   44999.0   10410.00
    16      531.14  283.15    0.183  0.60( 0.59) 0.99   46104.7   12101.10
    17      519.44  292.77    0.179  0.60( 0.59) 0.99   46934.4   10700.00
    18      507.94  310.28    0.174  0.60( 0.59) 0.99   48482.5   10200.00
    19      495.94  323.52    0.169  0.60( 0.59) 0.99   49422.2   12010.00
    20      484.33  333.69    0.166  0.60( 0.59) 0.99   49793.9   10300.00
    21      460.20  352.45    0.160  0.60( 0.59) 0.99   50099.6   10210.00
    22      406.62  400.91    0.153  0.60( 0.59) 0.99   50601.3   12000.00
    23      375.39  467.47    0.148  0.60( 0.60) 0.99   51169.7   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     857.90  Tc(MIN.) =  160.05
 AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   25749.12

****************************************************************************
 FLOW PROCESS FROM NODE  12721.00 TO NODE  12722.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    256.00  DOWNSTREAM(FEET) =    255.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   830.42   CHANNEL SLOPE =  0.0012
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.234
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       11.24      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     857.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.25
 AVERAGE FLOW DEPTH(FEET) =   8.20   TRAVEL TIME(MIN.) =   3.25
 Tc(MIN.) =  163.30
 SUBAREA AREA(ACRES) =    11.24       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =  25760.36     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =    51180.9         PEAK FLOW RATE(CFS) =     857.90
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.20 FLOW VELOCITY(FEET/SEC.) = 4.25
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	580.68	33.48	0.563	0.60(0.59)	0.99	2534.9	40510.00
2	551.19	38.95	0.518	0.60(0.59)	0.99	3264.5	31500.00
3	528.35	43.12	0.492	0.60(0.59)	0.99	3811.4	12710.00
4	481.16	51.49	0.445	0.60(0.59)	0.99	4836.1	31600.00
5	474.53	52.63	0.438	0.60(0.59)	0.99	4968.4	31810.00
6	492.64	83.73	0.350	0.60(0.59)	0.99	9384.9	40100.00
7	538.27	96.47	0.324	0.60(0.59)	0.99	11117.4	11831.00
8	646.43	120.42	0.277	0.60(0.59)	0.99	14812.5	11530.00
9	739.77	140.43	0.257	0.60(0.60)	0.99	18969.3	11000.00
10	857.90	163.30	0.234	0.60(0.60)	0.99	25760.4	10850.00
11	786.69	178.63	0.218	0.60(0.60)	0.99	29108.0	11220.00
12	731.30	189.73	0.214	0.60(0.60)	0.99	30863.2	10910.00
13	584.68	229.29	0.201	0.60(0.60)	0.99	37447.2	12410.00
14	551.81	261.94	0.190	0.60(0.59)	0.99	43525.4	12261.00
15	541.42	274.73	0.185	0.60(0.59)	0.99	45010.2	10410.00
16	531.14	286.82	0.181	0.60(0.59)	0.99	46116.0	12101.10
17	519.44	296.46	0.178	0.60(0.59)	0.99	46945.6	10700.00
18	507.94	313.99	0.172	0.60(0.59)	0.99	48493.8	10200.00
19	495.94	327.25	0.168	0.60(0.59)	0.99	49433.4	12010.00
20	484.33	337.44	0.165	0.60(0.59)	0.99	49805.1	10300.00
21	460.20	356.25	0.158	0.60(0.59)	0.99	50110.8	10210.00
22	406.62	404.83	0.153	0.60(0.59)	0.99	50612.5	12000.00
23	375.39	471.47	0.147	0.60(0.60)	0.99	51180.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 857.90 Tc(MIN.) = 163.30
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 25760.36

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610314T.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.13	72.18	0.60(0.59)	0.99	497.2	31400.00

TOTAL AREA(ACRES) = 497.2

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	580.68	33.48	0.563	0.60(0.59)	0.99	2534.9	40510.00
2	551.19	38.95	0.518	0.60(0.59)	0.99	3264.5	31500.00

3	528.35	43.12	0.492	0.60(0.59)	0.99	3811.4	12710.00
4	481.16	51.49	0.445	0.60(0.59)	0.99	4836.1	31600.00
5	474.53	52.63	0.438	0.60(0.59)	0.99	4968.4	31810.00
6	492.64	83.73	0.350	0.60(0.59)	0.99	9384.9	40100.00
7	538.27	96.47	0.324	0.60(0.59)	0.99	11117.4	11831.00
8	646.43	120.42	0.277	0.60(0.59)	0.99	14812.5	11530.00
9	739.77	140.43	0.257	0.60(0.60)	0.99	18969.3	11000.00
10	857.90	163.30	0.234	0.60(0.60)	0.99	25760.4	10850.00
11	786.69	178.63	0.218	0.60(0.60)	0.99	29108.0	11220.00
12	731.30	189.73	0.214	0.60(0.60)	0.99	30863.2	10910.00
13	584.68	229.29	0.201	0.60(0.60)	0.99	37447.2	12410.00
14	551.81	261.94	0.190	0.60(0.59)	0.99	43525.4	12261.00
15	541.42	274.73	0.185	0.60(0.59)	0.99	45010.2	10410.00
16	531.14	286.82	0.181	0.60(0.59)	0.99	46116.0	12101.10
17	519.44	296.46	0.178	0.60(0.59)	0.99	46945.6	10700.00
18	507.94	313.99	0.172	0.60(0.59)	0.99	48493.8	10200.00
19	495.94	327.25	0.168	0.60(0.59)	0.99	49433.4	12010.00
20	484.33	337.44	0.165	0.60(0.59)	0.99	49805.1	10300.00
21	460.20	356.25	0.158	0.60(0.59)	0.99	50110.8	10210.00
22	406.62	404.83	0.153	0.60(0.59)	0.99	50612.5	12000.00
23	375.39	471.47	0.147	0.60(0.60)	0.99	51180.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.13	72.18	0.373	0.60(0.59)	0.99	497.2	31400.00

LONGEST FLOWPATH FROM NODE 31400.00 TO NODE 12722.00 = 14614.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	587.78	33.48	0.563	0.60(0.59)	0.99	2765.5	40510.00
2	558.79	38.95	0.518	0.60(0.59)	0.99	3532.8	31500.00
3	536.34	43.12	0.492	0.60(0.59)	0.99	4108.4	12710.00
4	489.78	51.49	0.445	0.60(0.59)	0.99	5190.8	31600.00
5	483.21	52.63	0.438	0.60(0.59)	0.99	5330.9	31810.00
6	496.04	72.18	0.373	0.60(0.59)	0.99	8242.3	31400.00
7	502.14	83.73	0.350	0.60(0.59)	0.99	9882.1	40100.00
8	547.07	96.47	0.324	0.60(0.59)	0.99	11614.6	11831.00
9	653.95	120.42	0.277	0.60(0.59)	0.99	15309.7	11530.00
10	746.74	140.43	0.257	0.60(0.60)	0.99	19466.5	11000.00
11	864.25	163.30	0.234	0.60(0.60)	0.99	26257.6	10850.00
12	792.62	178.63	0.218	0.60(0.60)	0.99	29605.2	11220.00
13	737.11	189.73	0.214	0.60(0.60)	0.99	31360.4	10910.00
14	590.13	229.29	0.201	0.60(0.60)	0.99	37944.4	12410.00
15	556.96	261.94	0.190	0.60(0.59)	0.99	44022.6	12261.00
16	546.46	274.73	0.185	0.60(0.59)	0.99	45507.4	10410.00
17	536.07	286.82	0.181	0.60(0.59)	0.99	46613.2	12101.10
18	524.29	296.46	0.178	0.60(0.59)	0.99	47442.8	10700.00
19	512.62	313.99	0.172	0.60(0.59)	0.99	48991.0	10200.00
20	500.50	327.25	0.168	0.60(0.59)	0.99	49930.6	12010.00
21	488.80	337.44	0.165	0.60(0.59)	0.99	50302.3	10300.00
22	464.50	356.25	0.158	0.60(0.59)	0.99	50608.0	10210.00
23	410.78	404.83	0.153	0.60(0.59)	0.99	51109.7	12000.00
24	379.39	471.47	0.147	0.60(0.60)	0.99	51678.1	10100.00

TOTAL AREA(ACRES) = 51678.1

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      864.25  Tc(MIN.) =  163.302
  EFFECTIVE AREA(ACRES) =  26257.56  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51678.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12722.00 =  109951.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    255.00  DOWNSTREAM(FEET) =    252.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   624.00   CHANNEL SLOPE =  0.0046
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.232
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.42      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     864.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.07
  AVERAGE FLOW DEPTH(FEET) =   6.38   TRAVEL TIME(MIN.) =   1.47
  Tc(MIN.) =  164.77
  SUBAREA AREA(ACRES) =    62.42       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  26319.98     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    51740.6         PEAK FLOW RATE(CFS) =     864.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.38   FLOW VELOCITY(FEET/SEC.) =   7.07
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12740.00 =  110575.24 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      587.78   35.10    0.550  0.60( 0.59) 0.99    2828.0   40510.00
      2      558.79   40.59    0.507  0.60( 0.59) 0.99    3595.2   31500.00
      3      536.34   44.78    0.483  0.60( 0.59) 0.99    4170.9   12710.00
      4      489.78   53.19    0.435  0.60( 0.59) 0.99    5253.3   31600.00
      5      483.21   54.33    0.429  0.60( 0.59) 0.99    5393.4   31810.00
      6      496.04   73.87    0.369  0.60( 0.59) 0.99    8304.8   31400.00
      7      502.14   85.41    0.346  0.60( 0.59) 0.99    9944.6   40100.00
      8      547.07   98.12    0.321  0.60( 0.59) 0.99   11677.0   11831.00
      9      653.95  122.00    0.275  0.60( 0.59) 0.99   15372.2   11530.00
     10      746.74  141.96    0.255  0.60( 0.60) 0.99   19528.9   11000.00
     11      864.25  164.77    0.232  0.60( 0.60) 0.99   26320.0   10850.00
     12      792.62  180.14    0.217  0.60( 0.60) 0.99   29667.6   11220.00
     13      737.11  191.26    0.213  0.60( 0.60) 0.99   31422.8   10910.00
```



```
     14      590.13  230.91    0.200  0.60( 0.60) 0.99   38006.8   12410.00
     15      556.96  263.58    0.189  0.60( 0.59) 0.99   44085.1   12261.00
     16      546.46  276.38    0.185  0.60( 0.59) 0.99   45569.8   10410.00
     17      536.07  288.48    0.181  0.60( 0.59) 0.99   46675.6   12101.10
     18      524.29  298.13    0.178  0.60( 0.59) 0.99   47505.2   10700.00
     19      512.62  315.67    0.172  0.60( 0.59) 0.99   49053.4   10200.00
     20      500.50  328.94    0.167  0.60( 0.59) 0.99   49993.0   12010.00
     21      488.80  339.14    0.164  0.60( 0.59) 0.99   50364.7   10300.00
     22      464.50  357.97    0.158  0.60( 0.59) 0.99   50670.4   10210.00
     23      410.78  406.61    0.153  0.60( 0.59) 0.99   51172.2   12000.00
     24      379.39  473.28    0.147  0.60( 0.60) 0.99   51740.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     864.25  Tc(MIN.) =  164.77
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   26319.98

****************************************************************************
  FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  164.77
  RAINFALL INTENSITY(INCH/HR) =   0.23
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =   26319.98
  TOTAL STREAM AREA(ACRES) =   51740.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     864.25

****************************************************************************
  FLOW PROCESS FROM NODE  12730.00 TO NODE  12731.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   561.54
  ELEVATION DATA: UPSTREAM(FEET) =    613.29  DOWNSTREAM(FEET) =    551.75

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.823
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.014
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        6.33      0.60     1.000     0   13.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.36
  TOTAL AREA(ACRES) =      6.33   PEAK FLOW RATE(CFS) =      2.36

****************************************************************************
  FLOW PROCESS FROM NODE  12731.00 TO NODE  12732.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    551.75  DOWNSTREAM(FEET) =    494.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =   971.91   CHANNEL SLOPE =  0.0590
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.809
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       34.62      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.88
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.14
 AVERAGE FLOW DEPTH(FEET) =   0.79   TRAVEL TIME(MIN.) =   5.17
 Tc(MIN.) =   18.99
 SUBAREA AREA(ACRES) =    34.62       SUBAREA RUNOFF(CFS) =    6.50
 EFFECTIVE AREA(ACRES) =     40.95     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       40.9         PEAK FLOW RATE(CFS) =       7.69

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   3.35
 LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12732.00 =    1533.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12732.00 TO NODE  12733.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    494.40  DOWNSTREAM(FEET) =    431.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1156.41   CHANNEL SLOPE =  0.0548
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.677
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       59.52      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.98
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.47
 AVERAGE FLOW DEPTH(FEET) =   0.98   TRAVEL TIME(MIN.) =   5.56
 Tc(MIN.) =   24.55
 SUBAREA AREA(ACRES) =    59.52       SUBAREA RUNOFF(CFS) =    4.12
 EFFECTIVE AREA(ACRES) =    100.47     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      100.5         PEAK FLOW RATE(CFS) =       7.69
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.89   FLOW VELOCITY(FEET/SEC.) =   3.25
 LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12733.00 =    2689.86 FEET.

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 FLOW PROCESS FROM NODE  12733.00 TO NODE  12734.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    431.00  DOWNSTREAM(FEET) =    367.11
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1654.48   CHANNEL SLOPE =  0.0386
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.557
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       64.05      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.69
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.85
 AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   9.68
 Tc(MIN.) =   34.23
 SUBAREA AREA(ACRES) =    64.05       SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =    164.52     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =      164.5         PEAK FLOW RATE(CFS) =       7.69
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   2.85
 LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12734.00 =    4344.34 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    367.11  DOWNSTREAM(FEET) =    252.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.98   CHANNEL SLOPE =  0.0611
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.491
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       26.02      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.69
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.41
 AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   9.19
 Tc(MIN.) =   43.42
 SUBAREA AREA(ACRES) =    26.02       SUBAREA RUNOFF(CFS) =    0.00
```

```
  EFFECTIVE AREA(ACRES) =    190.54     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      190.5         PEAK FLOW RATE(CFS) =       7.69
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   3.41
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12740.00 =    6225.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   43.42
  RAINFALL INTENSITY(INCH/HR) =   0.49
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     190.54
  TOTAL STREAM AREA(ACRES) =     190.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.69

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      587.78   35.10    0.550  0.60( 0.59) 0.99    2828.0   40510.00
      1      558.79   40.59    0.507  0.60( 0.59) 0.99    3595.2   31500.00
      1      536.34   44.78    0.483  0.60( 0.59) 0.99    4170.9   12710.00
      1      489.78   53.19    0.435  0.60( 0.59) 0.99    5253.3   31600.00
      1      483.21   54.33    0.429  0.60( 0.59) 0.99    5393.4   31810.00
      1      496.04   73.87    0.369  0.60( 0.59) 0.99    8304.8   31400.00
      1      502.14   85.41    0.346  0.60( 0.59) 0.99    9944.6   40100.00
      1      547.07   98.12    0.321  0.60( 0.59) 0.99   11677.0   11831.00
      1      653.95  122.00    0.275  0.60( 0.59) 0.99   15372.2   11530.00
      1      746.74  141.96    0.255  0.60( 0.60) 0.99   19528.9   11000.00
      1      864.25  164.77    0.232  0.60( 0.60) 0.99   26320.0   10850.00
      1      792.62  180.14    0.217  0.60( 0.60) 0.99   29667.6   11220.00
      1      737.11  191.26    0.213  0.60( 0.60) 0.99   31422.8   10910.00
      1      590.13  230.91    0.200  0.60( 0.60) 0.99   38006.8   12410.00
      1      556.96  263.58    0.189  0.60( 0.59) 0.99   44085.1   12261.00
      1      546.46  276.38    0.185  0.60( 0.59) 0.99   45569.8   10410.00
      1      536.07  288.48    0.181  0.60( 0.59) 0.99   46675.6   12101.10
      1      524.29  298.13    0.178  0.60( 0.59) 0.99   47505.2   10700.00
      1      512.62  315.67    0.172  0.60( 0.59) 0.99   49053.4   10200.00
      1      500.50  328.94    0.167  0.60( 0.59) 0.99   49993.0   12010.00
      1      488.80  339.14    0.164  0.60( 0.59) 0.99   50364.7   10300.00
      1      464.50  357.97    0.158  0.60( 0.59) 0.99   50670.4   10210.00
      1      410.78  406.61    0.153  0.60( 0.59) 0.99   51172.2   12000.00
      1      379.39  473.28    0.147  0.60( 0.60) 0.99   51740.6   10100.00
      2        7.69   43.42    0.491  0.60( 0.60) 1.00     190.5   12730.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
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  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      594.74   35.10    0.550  0.60( 0.59) 0.99    2982.0   40510.00
      2      566.22   40.59    0.507  0.60( 0.59) 0.99    3773.3   31500.00
      3      551.33   43.42    0.491  0.60( 0.59) 0.99    4174.3   12730.00
      4      543.91   44.78    0.483  0.60( 0.59) 0.99    4361.4   12710.00
      5      496.60   53.19    0.435  0.60( 0.59) 0.99    5443.8   31600.00
      6      489.94   54.33    0.429  0.60( 0.59) 0.99    5583.9   31810.00
      7      501.83   73.87    0.369  0.60( 0.59) 0.99    8495.3   31400.00
      8      507.57   85.41    0.346  0.60( 0.59) 0.99   10135.1   40100.00
      9      552.10   98.12    0.321  0.60( 0.59) 0.99   11867.6   11831.00
     10      658.26  122.00    0.275  0.60( 0.59) 0.99   15562.7   11530.00
     11      750.74  141.96    0.255  0.60( 0.60) 0.99   19719.4   11000.00
     12      867.89  164.77    0.232  0.60( 0.60) 0.99   26510.5   10850.00
     13      796.02  180.14    0.217  0.60( 0.60) 0.99   29858.1   11220.00
     14      740.45  191.26    0.213  0.60( 0.60) 0.99   31613.4   10910.00
     15      593.27  230.91    0.200  0.60( 0.60) 0.99   38197.3   12410.00
     16      559.93  263.58    0.189  0.60( 0.59) 0.99   44275.6   12261.00
     17      549.36  276.38    0.185  0.60( 0.59) 0.99   45760.4   10410.00
     18      538.91  288.48    0.181  0.60( 0.59) 0.99   46866.1   12101.10
     19      527.07  298.13    0.178  0.60( 0.59) 0.99   47695.8   10700.00
     20      515.32  315.67    0.172  0.60( 0.59) 0.99   49243.9   10200.00
     21      503.13  328.94    0.167  0.60( 0.59) 0.99   50183.6   12010.00
     22      491.37  339.14    0.164  0.60( 0.59) 0.99   50555.3   10300.00
     23      466.97  357.97    0.158  0.60( 0.59) 0.99   50861.0   10210.00
     24      413.18  406.61    0.153  0.60( 0.59) 0.99   51362.7   12000.00
     25      381.70  473.28    0.147  0.60( 0.60) 0.99   51931.1   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     867.89    Tc(MIN.) =   164.77
  EFFECTIVE AREA(ACRES) =   26510.52   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51931.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12740.00 =  110575.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12741.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    252.10  DOWNSTREAM(FEET) =    247.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   401.47   CHANNEL SLOPE =  0.0127
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     867.89
  FLOW VELOCITY(FEET/SEC.) =  10.31   FLOW DEPTH(FEET) =   5.30
  TRAVEL TIME(MIN.) =   0.65   Tc(MIN.) =  165.42
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      594.74   35.81    0.544  0.60( 0.59) 0.99    2982.0   40510.00
      2      566.22   41.31    0.503  0.60( 0.59) 0.99    3773.3   31500.00
```

3	551.33	44.14	0.486	0.60(0.59)	0.99	4174.3	12730.00
4	543.91	45.51	0.479	0.60(0.59)	0.99	4361.4	12710.00
5	496.60	53.93	0.431	0.60(0.59)	0.99	5443.8	31600.00
6	489.94	55.08	0.425	0.60(0.59)	0.99	5583.9	31810.00
7	501.83	74.61	0.368	0.60(0.59)	0.99	8495.3	31400.00
8	507.57	86.15	0.345	0.60(0.59)	0.99	10135.1	40100.00
9	552.10	98.84	0.319	0.60(0.59)	0.99	11867.6	11831.00
10	658.26	122.69	0.274	0.60(0.59)	0.99	15562.7	11530.00
11	750.74	142.63	0.254	0.60(0.60)	0.99	19719.4	11000.00
12	867.89	165.42	0.232	0.60(0.60)	0.99	26510.5	10850.00
13	796.02	180.80	0.217	0.60(0.60)	0.99	29858.1	11220.00
14	740.45	191.94	0.213	0.60(0.60)	0.99	31613.4	10910.00
15	593.27	231.62	0.200	0.60(0.60)	0.99	38197.3	12410.00
16	559.93	264.31	0.189	0.60(0.59)	0.99	44275.6	12261.00
17	549.36	277.11	0.185	0.60(0.59)	0.99	45760.4	10410.00
18	538.91	289.21	0.181	0.60(0.59)	0.99	46866.1	12101.10
19	527.07	298.86	0.177	0.60(0.59)	0.99	47695.8	10700.00
20	515.32	316.41	0.172	0.60(0.59)	0.99	49243.9	10200.00
21	503.13	329.68	0.167	0.60(0.59)	0.99	50183.6	12010.00
22	491.37	339.89	0.164	0.60(0.59)	0.99	50555.3	10300.00
23	466.97	358.73	0.157	0.60(0.59)	0.99	50861.0	10210.00
24	413.18	407.39	0.153	0.60(0.59)	0.99	51362.7	12000.00
25	381.70	474.08	0.147	0.60(0.60)	0.99	51931.1	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 867.89 Tc(MIN.) = 165.42
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 26510.52

****
FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610313T.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.76	33.47	0.60(0.58)	0.97	132.0	31300.00

TOTAL AREA(ACRES) = 132.0

****
FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	594.74	35.81	0.544	0.60(0.59)	0.99	2982.0	40510.00
2	566.22	41.31	0.503	0.60(0.59)	0.99	3773.3	31500.00
3	551.33	44.14	0.486	0.60(0.59)	0.99	4174.3	12730.00

4	543.91	45.51	0.479	0.60(0.59)	0.99	4361.4	12710.00
5	496.60	53.93	0.431	0.60(0.59)	0.99	5443.8	31600.00
6	489.94	55.08	0.425	0.60(0.59)	0.99	5583.9	31810.00
7	501.83	74.61	0.368	0.60(0.59)	0.99	8495.3	31400.00
8	507.57	86.15	0.345	0.60(0.59)	0.99	10135.1	40100.00
9	552.10	98.84	0.319	0.60(0.59)	0.99	11867.6	11831.00
10	658.26	122.69	0.274	0.60(0.59)	0.99	15562.7	11530.00
11	750.74	142.63	0.254	0.60(0.60)	0.99	19719.4	11000.00
12	867.89	165.42	0.232	0.60(0.60)	0.99	26510.5	10850.00
13	796.02	180.80	0.217	0.60(0.60)	0.99	29858.1	11220.00
14	740.45	191.94	0.213	0.60(0.60)	0.99	31613.4	10910.00
15	593.27	231.62	0.200	0.60(0.60)	0.99	38197.3	12410.00
16	559.93	264.31	0.189	0.60(0.59)	0.99	44275.6	12261.00
17	549.36	277.11	0.185	0.60(0.59)	0.99	45760.4	10410.00
18	538.91	289.21	0.181	0.60(0.59)	0.99	46866.1	12101.10
19	527.07	298.86	0.177	0.60(0.59)	0.99	47695.8	10700.00
20	515.32	316.41	0.172	0.60(0.59)	0.99	49243.9	10200.00
21	503.13	329.68	0.167	0.60(0.59)	0.99	50183.6	12010.00
22	491.37	339.89	0.164	0.60(0.59)	0.99	50555.3	10300.00
23	466.97	358.73	0.157	0.60(0.59)	0.99	50861.0	10210.00
24	413.18	407.39	0.153	0.60(0.59)	0.99	51362.7	12000.00
25	381.70	474.08	0.147	0.60(0.60)	0.99	51931.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.76	33.47	0.563	0.60(0.58)	0.97	132.0	31300.00

LONGEST FLOWPATH FROM NODE 31300.00 TO NODE 12741.00 = 5775.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	582.94	33.47	0.563	0.60(0.59)	0.99	2918.5	31300.00
2	602.24	35.81	0.544	0.60(0.59)	0.99	3114.0	40510.00
3	573.14	41.31	0.503	0.60(0.59)	0.99	3905.3	31500.00
4	558.03	44.14	0.486	0.60(0.59)	0.99	4306.3	12730.00
5	550.51	45.51	0.479	0.60(0.59)	0.99	4493.4	12710.00
6	502.54	53.93	0.431	0.60(0.59)	0.99	5575.8	31600.00
7	495.79	55.08	0.425	0.60(0.59)	0.99	5715.9	31810.00
8	506.90	74.61	0.368	0.60(0.59)	0.99	8627.3	31400.00
9	512.32	86.15	0.345	0.60(0.59)	0.99	10267.1	40100.00
10	556.50	98.84	0.319	0.60(0.59)	0.99	11999.5	11831.00
11	662.04	122.69	0.274	0.60(0.59)	0.99	15694.7	11530.00
12	754.25	142.63	0.254	0.60(0.60)	0.99	19851.4	11000.00
13	871.08	165.42	0.232	0.60(0.60)	0.99	26642.5	10850.00
14	799.01	180.80	0.217	0.60(0.60)	0.99	29990.1	11220.00
15	743.39	191.94	0.213	0.60(0.60)	0.99	31745.3	10910.00
16	596.02	231.62	0.200	0.60(0.60)	0.99	38329.3	12410.00
17	562.53	264.31	0.189	0.60(0.59)	0.99	44407.6	12261.00
18	551.90	277.11	0.185	0.60(0.59)	0.99	45892.3	10410.00
19	541.40	289.21	0.181	0.60(0.59)	0.99	46998.1	12101.10
20	529.52	298.86	0.177	0.60(0.59)	0.99	47827.7	10700.00
21	517.68	316.41	0.172	0.60(0.59)	0.99	49375.9	10200.00
22	505.43	329.68	0.167	0.60(0.59)	0.99	50315.6	12010.00
23	493.62	339.89	0.164	0.60(0.59)	0.99	50687.2	10300.00
24	469.14	358.73	0.157	0.60(0.59)	0.99	50993.0	10210.00
25	415.29	407.39	0.153	0.60(0.59)	0.99	51494.7	12000.00

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    26      383.72  474.08    0.147  0.60( 0.60) 0.99   52063.1   10100.00
   TOTAL AREA(ACRES) =     52063.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      871.08  Tc(MIN.) =  165.422
  EFFECTIVE AREA(ACRES) =  26642.49  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    52063.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12800.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    247.00  DOWNSTREAM(FEET) =    240.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   819.00   CHANNEL SLOPE =  0.0085
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.230
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.31      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     871.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.90
  AVERAGE FLOW DEPTH(FEET) =   5.71   TRAVEL TIME(MIN.) =   1.53
  Tc(MIN.) =  166.96
  SUBAREA AREA(ACRES) =    17.31       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  26659.80     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    52080.4         PEAK FLOW RATE(CFS) =     871.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.71   FLOW VELOCITY(FEET/SEC.) =   8.90
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      582.94   35.16    0.549  0.60( 0.59) 0.99    2935.8   31300.00
      2      602.24   37.49    0.530  0.60( 0.59) 0.99    3131.3   40510.00
      3      573.14   43.02    0.493  0.60( 0.59) 0.99    3922.6   31500.00
      4      558.03   45.86    0.477  0.60( 0.59) 0.99    4323.6   12730.00
      5      550.51   47.23    0.469  0.60( 0.59) 0.99    4510.7   12710.00
      6      502.54   55.70    0.421  0.60( 0.59) 0.99    5593.1   31600.00
      7      495.79   56.84    0.415  0.60( 0.59) 0.99    5733.2   31810.00
      8      506.90   76.37    0.364  0.60( 0.59) 0.99    8644.6   31400.00
      9      512.32   87.90    0.341  0.60( 0.59) 0.99   10284.4   40100.00
     10      556.50  100.56    0.316  0.60( 0.59) 0.99   12016.9   11831.00
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     11      662.04  124.34    0.273  0.60( 0.59) 0.99   15712.0   11530.00
     12      754.25  144.22    0.253  0.60( 0.60) 0.99   19868.7   11000.00
     13      871.08  166.96    0.230  0.60( 0.60) 0.99   26659.8   10850.00
     14      799.01  182.36    0.216  0.60( 0.60) 0.99   30007.4   11220.00
     15      743.39  193.53    0.212  0.60( 0.60) 0.99   31762.6   10910.00
     16      596.02  233.31    0.199  0.60( 0.60) 0.99   38346.6   12410.00
     17      562.53  266.02    0.188  0.60( 0.59) 0.99   44424.9   12261.00
     18      551.90  278.83    0.184  0.60( 0.59) 0.99   45909.6   10410.00
     19      541.40  290.93    0.180  0.60( 0.59) 0.99   47015.4   12101.10
     20      529.52  300.60    0.177  0.60( 0.59) 0.99   47845.0   10700.00
     21      517.68  318.15    0.171  0.60( 0.59) 0.99   49393.2   10200.00
     22      505.43  331.44    0.167  0.60( 0.59) 0.99   50332.9   12010.00
     23      493.62  341.66    0.163  0.60( 0.59) 0.99   50704.6   10300.00
     24      469.14  360.52    0.157  0.60( 0.59) 0.99   51010.3   10210.00
     25      415.29  409.24    0.153  0.60( 0.59) 0.99   51512.0   12000.00
     26      383.72  475.96    0.147  0.60( 0.60) 0.99   52080.4   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     871.08  Tc(MIN.) =  166.96
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   26659.80
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    52080.4  TC(MIN.) =    166.96
  EFFECTIVE AREA(ACRES) =  26659.80  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.994
  PEAK FLOW RATE(CFS)   =     871.08

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      582.94   35.16    0.549  0.60( 0.59) 0.99    2935.8   31300.00
      2      602.24   37.49    0.530  0.60( 0.59) 0.99    3131.3   40510.00
      3      573.14   43.02    0.493  0.60( 0.59) 0.99    3922.6   31500.00
      4      558.03   45.86    0.477  0.60( 0.59) 0.99    4323.6   12730.00
      5      550.51   47.23    0.469  0.60( 0.59) 0.99    4510.7   12710.00
      6      502.54   55.70    0.421  0.60( 0.59) 0.99    5593.1   31600.00
      7      495.79   56.84    0.415  0.60( 0.59) 0.99    5733.2   31810.00
      8      506.90   76.37    0.364  0.60( 0.59) 0.99    8644.6   31400.00
      9      512.32   87.90    0.341  0.60( 0.59) 0.99   10284.4   40100.00
     10      556.50  100.56    0.316  0.60( 0.59) 0.99   12016.9   11831.00
     11      662.04  124.34    0.273  0.60( 0.59) 0.99   15712.0   11530.00
     12      754.25  144.22    0.253  0.60( 0.60) 0.99   19868.7   11000.00
     13      871.08  166.96    0.230  0.60( 0.60) 0.99   26659.8   10850.00
     14      799.01  182.36    0.216  0.60( 0.60) 0.99   30007.4   11220.00
     15      743.39  193.53    0.212  0.60( 0.60) 0.99   31762.6   10910.00
     16      596.02  233.31    0.199  0.60( 0.60) 0.99   38346.6   12410.00
     17      562.53  266.02    0.188  0.60( 0.59) 0.99   44424.9   12261.00
     18      551.90  278.83    0.184  0.60( 0.59) 0.99   45909.6   10410.00
     19      541.40  290.93    0.180  0.60( 0.59) 0.99   47015.4   12101.10
     20      529.52  300.60    0.177  0.60( 0.59) 0.99   47845.0   10700.00
     21      517.68  318.15    0.171  0.60( 0.59) 0.99   49393.2   10200.00
     22      505.43  331.44    0.167  0.60( 0.59) 0.99   50332.9   12010.00
     23      493.62  341.66    0.163  0.60( 0.59) 0.99   50704.6   10300.00
     24      469.14  360.52    0.157  0.60( 0.59) 0.99   51010.3   10210.00
     25      415.29  409.24    0.153  0.60( 0.59) 0.99   51512.0   12000.00
     26      383.72  475.96    0.147  0.60( 0.60) 0.99   52080.4   10100.00
============================================================================
============================================================================
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S28.DAT
  TIME/DATE OF STUDY: 07:54 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.860
   2)   10.00;  1.240
   3)   15.00;  0.945
   4)   20.00;  0.774
   5)   25.00;  0.667
   6)   30.00;  0.591
   7)   40.00;  0.510
   8)   50.00;  0.453
   9)   60.00;  0.399
  10)   90.00;  0.345
  11)  120.00;  0.289
  12)  180.00;  0.235
  13)  360.00;  0.179
  14) 1200.00;  0.083
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610501T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       71.25   40.57  0.60( 0.59) 0.98    1023.7   50120.00
      2       56.82   44.15  0.60( 0.59) 0.98    1046.4   50150.00
      3       24.29   51.88  0.60( 0.59) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       71.25   40.57  0.60( 0.59) 0.98    1023.7   50120.00
      2       56.82   44.15  0.60( 0.59) 0.98    1046.4   50150.00
      3       24.29   51.88  0.60( 0.59) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =      1063.4
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     1063.4  TC(MIN.) =     40.57
  EFFECTIVE AREA(ACRES) =   1023.70  AREA-AVERAGED Fm(INCH/HR)=  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.981
  PEAK FLOW RATE(CFS)   =      71.25

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       71.25   40.57    0.507  0.60( 0.59) 0.98    1023.7   50120.00
      2       56.82   44.15    0.486  0.60( 0.59) 0.98    1046.4   50150.00
      3       24.29   51.88    0.443  0.60( 0.59) 0.98    1063.4   50100.00
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S29.DAT
  TIME/DATE OF STUDY: 07:57 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.854
   2)   10.00;  1.237
   3)   15.00;  0.943
   4)   20.00;  0.773
   5)   25.00;  0.666
   6)   30.00;  0.591
   7)   40.00;  0.509
   8)   50.00;  0.452
   9)   60.00;  0.396
  10)   90.00;  0.339
  11)  120.00;  0.285
  12)  180.00;  0.229
  13)  360.00;  0.175
  14) 1200.00;  0.082
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S27.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      602.24   37.49  0.60( 0.59) 0.99    3131.3   40510.00
      2      502.54   55.70  0.60( 0.59) 0.99    5593.1   31600.00
      3      506.90   76.37  0.60( 0.59) 0.99    8644.6   31400.00
      4      512.32   87.90  0.60( 0.59) 0.99   10284.4   40100.00
      5      556.50  100.56  0.60( 0.59) 0.99   12016.9   11831.00
      6      662.04  124.34  0.60( 0.59) 0.99   15712.0   11530.00
      7      754.25  144.22  0.60( 0.60) 0.99   19868.7   11000.00
      8      871.08  166.96  0.60( 0.60) 0.99   26659.8   10850.00
      9      799.01  182.36  0.60( 0.60) 0.99   30007.4   11220.00
     10      743.39  193.53  0.60( 0.60) 0.99   31762.6   10910.00
     11      596.02  233.31  0.60( 0.60) 0.99   38346.6   12410.00
     12      562.53  266.02  0.60( 0.59) 0.99   44424.9   12261.00
     13      551.90  278.83  0.60( 0.59) 0.99   45909.6   10410.00
     14      541.40  290.93  0.60( 0.59) 0.99   47015.4   12101.10
     15      517.68  318.15  0.60( 0.59) 0.99   49393.2   10200.00
     16      505.43  331.44  0.60( 0.59) 0.99   50332.9   12010.00
     17      493.62  341.66  0.60( 0.59) 0.99   50704.6   10300.00
     18      469.14  360.52  0.60( 0.59) 0.99   51010.3   10210.00
     19      415.29  409.24  0.60( 0.59) 0.99   51512.0   12000.00
     20      383.72  475.96  0.60( 0.60) 0.99   52080.4   10100.00
    TOTAL AREA(ACRES) =    52080.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S28.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       71.25   40.57  0.60( 0.59) 0.98    1023.7   50120.00
      2       56.82   44.15  0.60( 0.59) 0.98    1046.4   50150.00
      3       24.29   51.88  0.60( 0.59) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       71.25   40.57  0.60( 0.59) 0.98    1023.7   50120.00
      2       56.82   44.15  0.60( 0.59) 0.98    1046.4   50150.00
      3       24.29   51.88  0.60( 0.59) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =      1063.4
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       71.25   40.57    0.506  0.60( 0.59) 0.98    1023.7   50120.00
      2       56.82   44.15    0.485  0.60( 0.59) 0.98    1046.4   50150.00
      3       24.29   51.88    0.441  0.60( 0.59) 0.98    1063.4   50100.00
  LONGEST FLOWPATH FROM NODE  50150.00 TO NODE  12800.00 =   11349.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      602.24   37.49    0.530  0.60( 0.59) 0.99    3131.3   40510.00
      2      502.54   55.70    0.420  0.60( 0.59) 0.99    5593.1   31600.00
      3      506.90   76.37    0.365  0.60( 0.59) 0.99    8644.6   31400.00
      4      512.32   87.90    0.343  0.60( 0.59) 0.99   10284.4   40100.00
      5      556.50  100.56    0.320  0.60( 0.59) 0.99   12016.9   11831.00
      6      662.04  124.34    0.281  0.60( 0.59) 0.99   15712.0   11530.00
      7      754.25  144.22    0.262  0.60( 0.60) 0.99   19868.7   11000.00
      8      871.08  166.96    0.241  0.60( 0.60) 0.99   26659.8   10850.00
      9      799.01  182.36    0.228  0.60( 0.60) 0.99   30007.4   11220.00
     10      743.39  193.53    0.225  0.60( 0.60) 0.99   31762.6   10910.00
     11      596.02  233.31    0.213  0.60( 0.60) 0.99   38346.6   12410.00
     12      562.53  266.02    0.203  0.60( 0.59) 0.99   44424.9   12261.00
     13      551.90  278.83    0.199  0.60( 0.59) 0.99   45909.6   10410.00
     14      541.40  290.93    0.196  0.60( 0.59) 0.99   47015.4   12101.10
     15      517.68  318.15    0.188  0.60( 0.59) 0.99   49393.2   10200.00
     16      505.43  331.44    0.184  0.60( 0.59) 0.99   50332.9   12010.00
     17      493.62  341.66    0.181  0.60( 0.59) 0.99   50704.6   10300.00
     18      469.14  360.52    0.175  0.60( 0.59) 0.99   51010.3   10210.00
     19      415.29  409.24    0.170  0.60( 0.59) 0.99   51512.0   12000.00
     20      383.72  475.96    0.162  0.60( 0.60) 0.99   52080.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      671.19   37.49    0.530  0.60( 0.59) 0.99    4077.3   40510.00
      2      656.63   40.57    0.506  0.60( 0.59) 0.99    4571.4   50120.00
      3      622.61   44.15    0.485  0.60( 0.59) 0.99    5077.8   50150.00
      4      547.74   51.88    0.441  0.60( 0.59) 0.99    6140.3   50100.00
      5      525.66   55.70    0.420  0.60( 0.59) 0.99    6656.5   31600.00
      6      526.98   76.37    0.365  0.60( 0.59) 0.99    9708.0   31400.00
      7      531.20   87.90    0.343  0.60( 0.59) 0.99   11347.8   40100.00
      8      574.11  100.56    0.320  0.60( 0.59) 0.99   13080.2   11831.00
      9      677.50  124.34    0.281  0.60( 0.59) 0.99   16775.4   11530.00
     10      768.69  144.22    0.262  0.60( 0.59) 0.99   20932.1   11000.00
     11      884.35  166.96    0.241  0.60( 0.60) 0.99   27723.2   10850.00
     12      811.57  182.36    0.228  0.60( 0.60) 0.99   31070.8   11220.00
     13      755.77  193.53    0.225  0.60( 0.60) 0.99   32826.0   10910.00
     14      607.75  233.31    0.213  0.60( 0.60) 0.99   39410.0   12410.00
     15      573.71  266.02    0.203  0.60( 0.59) 0.99   45488.3   12261.00
```



```
     16      562.87  278.83    0.199  0.60( 0.59) 0.99   46973.0   10410.00
     17      552.17  290.93    0.196  0.60( 0.59) 0.99   48078.8   12101.10
     18      528.00  318.15    0.188  0.60( 0.59) 0.99   50456.6   10200.00
     19      515.53  331.44    0.184  0.60( 0.59) 0.99   51396.2   12010.00
     20      503.56  341.66    0.181  0.60( 0.59) 0.99   51767.9   10300.00
     21      478.77  360.52    0.175  0.60( 0.59) 0.99   52073.7   10210.00
     22      424.62  409.24    0.170  0.60( 0.59) 0.99   52575.4   12000.00
     23      392.65  475.96    0.162  0.60( 0.59) 0.99   53143.8   10100.00
   TOTAL AREA(ACRES) =     53143.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      884.35  Tc(MIN.) =  166.955
  EFFECTIVE AREA(ACRES) =  27723.18  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53143.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12801.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.00  DOWNSTREAM(FEET) =    234.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.96   CHANNEL SLOPE =  0.0054
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     884.35
  FLOW VELOCITY(FEET/SEC.) =   7.52   FLOW DEPTH(FEET) =   6.26
  TRAVEL TIME(MIN.) =   2.46   Tc(MIN.) =  169.42
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      671.19   40.13    0.508  0.60( 0.59) 0.99    4077.3   40510.00
      2      656.63   43.22    0.491  0.60( 0.59) 0.99    4571.4   50120.00
      3      622.61   46.84    0.470  0.60( 0.59) 0.99    5077.8   50150.00
      4      547.74   54.65    0.426  0.60( 0.59) 0.99    6140.3   50100.00
      5      525.66   58.50    0.404  0.60( 0.59) 0.99    6656.5   31600.00
      6      526.98   79.17    0.360  0.60( 0.59) 0.99    9708.0   31400.00
      7      531.20   90.70    0.338  0.60( 0.59) 0.99   11347.8   40100.00
      8      574.11  103.30    0.315  0.60( 0.59) 0.99   13080.2   11831.00
      9      677.50  126.97    0.278  0.60( 0.59) 0.99   16775.4   11530.00
     10      768.69  146.77    0.260  0.60( 0.59) 0.99   20932.1   11000.00
     11      884.35  169.42    0.239  0.60( 0.60) 0.99   27723.2   10850.00
     12      811.57  184.88    0.228  0.60( 0.60) 0.99   31070.8   11220.00
     13      755.77  196.09    0.224  0.60( 0.60) 0.99   32826.0   10910.00
     14      607.75  236.01    0.212  0.60( 0.60) 0.99   39410.0   12410.00
     15      573.71  268.76    0.202  0.60( 0.59) 0.99   45488.3   12261.00
     16      562.87  281.58    0.199  0.60( 0.59) 0.99   46973.0   10410.00
     17      552.17  293.70    0.195  0.60( 0.59) 0.99   48078.8   12101.10
     18      528.00  320.95    0.187  0.60( 0.59) 0.99   50456.6   10200.00
     19      515.53  334.25    0.183  0.60( 0.59) 0.99   51396.2   12010.00
     20      503.56  344.49    0.180  0.60( 0.59) 0.99   51767.9   10300.00
     21      478.77  363.38    0.175  0.60( 0.59) 0.99   52073.7   10210.00
     22      424.62  412.19    0.169  0.60( 0.59) 0.99   52575.4   12000.00
     23      392.65  478.98    0.162  0.60( 0.59) 0.99   53143.8   10100.00
```

```
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     884.35  Tc(MIN.) =  169.42
 AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   27723.18

****************************************************************************
 FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610502T.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
     1       14.59   11.93  0.60( 0.56) 0.94      28.9   50200.00
   TOTAL AREA(ACRES) =       28.9

****************************************************************************
 FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      671.19   40.13    0.508  0.60( 0.59) 0.99    4077.3   40510.00
     2      656.63   43.22    0.491  0.60( 0.59) 0.99    4571.4   50120.00
     3      622.61   46.84    0.470  0.60( 0.59) 0.99    5077.8   50150.00
     4      547.74   54.65    0.426  0.60( 0.59) 0.99    6140.3   50100.00
     5      525.66   58.50    0.404  0.60( 0.59) 0.99    6656.5   31600.00
     6      526.98   79.17    0.360  0.60( 0.59) 0.99    9708.0   31400.00
     7      531.20   90.70    0.338  0.60( 0.59) 0.99   11347.8   40100.00
     8      574.11  103.30    0.315  0.60( 0.59) 0.99   13080.2   11831.00
     9      677.50  126.97    0.278  0.60( 0.59) 0.99   16775.4   11530.00
    10      768.69  146.77    0.260  0.60( 0.59) 0.99   20932.1   11000.00
    11      884.35  169.42    0.239  0.60( 0.60) 0.99   27723.2   10850.00
    12      811.57  184.88    0.228  0.60( 0.60) 0.99   31070.8   11220.00
    13      755.77  196.09    0.224  0.60( 0.60) 0.99   32826.0   10910.00
    14      607.75  236.01    0.212  0.60( 0.60) 0.99   39410.0   12410.00
    15      573.71  268.76    0.202  0.60( 0.59) 0.99   45488.3   12261.00
    16      562.87  281.58    0.199  0.60( 0.59) 0.99   46973.0   10410.00
    17      552.17  293.70    0.195  0.60( 0.59) 0.99   48078.8   12101.10
    18      528.00  320.95    0.187  0.60( 0.59) 0.99   50456.6   10200.00
    19      515.53  334.25    0.183  0.60( 0.59) 0.99   51396.2   12010.00
    20      503.56  344.49    0.180  0.60( 0.59) 0.99   51767.9   10300.00
    21      478.77  363.38    0.175  0.60( 0.59) 0.99   52073.7   10210.00
    22      424.62  412.19    0.169  0.60( 0.59) 0.99   52575.4   12000.00
    23      392.65  478.98    0.162  0.60( 0.59) 0.99   53143.8   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
```



```
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       14.59   11.93    1.124  0.60( 0.56) 0.94      28.9   50200.00
 LONGEST FLOWPATH FROM NODE  50200.00 TO NODE  12801.00 =    1426.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      455.60   11.93    1.124  0.60( 0.59) 0.99    1240.5   50200.00
     2      672.03   40.13    0.508  0.60( 0.59) 0.99    4106.2   40510.00
     3      657.44   43.22    0.491  0.60( 0.59) 0.99    4600.3   50120.00
     4      623.39   46.84    0.470  0.60( 0.59) 0.99    5106.6   50150.00
     5      548.44   54.65    0.426  0.60( 0.59) 0.99    6169.2   50100.00
     6      526.33   58.50    0.404  0.60( 0.59) 0.99    6685.3   31600.00
     7      527.58   79.17    0.360  0.60( 0.59) 0.99    9736.8   31400.00
     8      531.75   90.70    0.338  0.60( 0.59) 0.99   11376.6   40100.00
     9      574.64  103.30    0.315  0.60( 0.59) 0.99   13109.1   11831.00
    10      677.96  126.97    0.278  0.60( 0.59) 0.99   16804.2   11530.00
    11      769.12  146.77    0.260  0.60( 0.59) 0.99   20961.0   11000.00
    12      884.75  169.42    0.239  0.60( 0.60) 0.99   27752.1   10850.00
    13      811.95  184.88    0.228  0.60( 0.60) 0.99   31099.7   11220.00
    14      756.14  196.09    0.224  0.60( 0.60) 0.99   32854.9   10910.00
    15      608.10  236.01    0.212  0.60( 0.60) 0.99   39438.9   12410.00
    16      574.05  268.76    0.202  0.60( 0.59) 0.99   45517.1   12261.00
    17      563.20  281.58    0.199  0.60( 0.59) 0.99   47001.9   10410.00
    18      552.49  293.70    0.195  0.60( 0.59) 0.99   48107.7   12101.10
    19      528.31  320.95    0.187  0.60( 0.59) 0.99   50485.5   10200.00
    20      515.84  334.25    0.183  0.60( 0.59) 0.99   51425.1   12010.00
    21      503.85  344.49    0.180  0.60( 0.59) 0.99   51796.8   10300.00
    22      479.06  363.38    0.175  0.60( 0.59) 0.99   52102.5   10210.00
    23      424.90  412.19    0.169  0.60( 0.59) 0.99   52604.2   12000.00
    24      392.92  478.98    0.162  0.60( 0.59) 0.99   53172.6   10100.00
   TOTAL AREA(ACRES) =     53172.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      884.75  Tc(MIN.) =  169.417
 EFFECTIVE AREA(ACRES) =  27752.05  AREA-AVERAGED Fm(INCH/HR) =  0.60
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    53172.6
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12801.00 TO NODE  12901.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    234.00  DOWNSTREAM(FEET) =    216.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2009.32   CHANNEL SLOPE =  0.0090
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 CHANNEL FLOW THRU SUBAREA(CFS) =     884.75
 FLOW VELOCITY(FEET/SEC.) =   9.10   FLOW DEPTH(FEET) =   5.69
 TRAVEL TIME(MIN.) =   3.68   Tc(MIN.) =  173.10
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	455.60	16.27	0.900	0.60(0.59)	0.99	1240.5	50200.00
2	672.03	44.08	0.486	0.60(0.59)	0.99	4106.2	40510.00
3	657.44	47.19	0.468	0.60(0.59)	0.99	4600.3	50120.00
4	623.39	50.86	0.447	0.60(0.59)	0.99	5106.6	50150.00
5	548.44	58.80	0.403	0.60(0.59)	0.99	6169.2	50100.00
6	526.33	62.69	0.391	0.60(0.59)	0.99	6685.3	31600.00
7	527.58	83.36	0.352	0.60(0.59)	0.99	9736.8	31400.00
8	531.75	94.88	0.330	0.60(0.59)	0.99	11376.6	40100.00
9	574.64	107.40	0.308	0.60(0.59)	0.99	13109.1	11831.00
10	677.96	130.90	0.275	0.60(0.59)	0.99	16804.2	11530.00
11	769.12	150.58	0.256	0.60(0.59)	0.99	20961.0	11000.00
12	884.75	173.10	0.235	0.60(0.60)	0.99	27752.1	10850.00
13	811.95	188.64	0.226	0.60(0.60)	0.99	31099.7	11220.00
14	756.14	199.92	0.223	0.60(0.60)	0.99	32854.9	10910.00
15	608.10	240.06	0.211	0.60(0.60)	0.99	39438.9	12410.00
16	574.05	272.86	0.201	0.60(0.59)	0.99	45517.1	12261.00
17	563.20	285.71	0.197	0.60(0.59)	0.99	47001.9	10410.00
18	552.49	297.85	0.194	0.60(0.59)	0.99	48107.7	12101.10
19	528.31	325.14	0.185	0.60(0.59)	0.99	50485.5	10200.00
20	515.84	338.47	0.181	0.60(0.59)	0.99	51425.1	12010.00
21	503.85	348.73	0.178	0.60(0.59)	0.99	51796.8	10300.00
22	479.06	367.68	0.174	0.60(0.59)	0.99	52102.5	10210.00
23	424.90	416.61	0.169	0.60(0.59)	0.99	52604.2	12000.00
24	392.92	483.49	0.161	0.60(0.59)	0.99	53172.6	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 884.75 Tc(MIN.) = 173.10
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 27752.05

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========

PEAK FLOWRATE TABLE FILE NAME: 0610312T.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.12	50.76	0.60(0.57)	0.96	385.8	31200.00

TOTAL AREA(ACRES) = 385.8

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	455.60	16.27	0.900	0.60(0.59)	0.99	1240.5	50200.00
2	672.03	44.08	0.486	0.60(0.59)	0.99	4106.2	40510.00
3	657.44	47.19	0.468	0.60(0.59)	0.99	4600.3	50120.00
4	623.39	50.86	0.447	0.60(0.59)	0.99	5106.6	50150.00
5	548.44	58.80	0.403	0.60(0.59)	0.99	6169.2	50100.00
6	526.33	62.69	0.391	0.60(0.59)	0.99	6685.3	31600.00
7	527.58	83.36	0.352	0.60(0.59)	0.99	9736.8	31400.00

8	531.75	94.88	0.330	0.60(0.59)	0.99	11376.6	40100.00
9	574.64	107.40	0.308	0.60(0.59)	0.99	13109.1	11831.00
10	677.96	130.90	0.275	0.60(0.59)	0.99	16804.2	11530.00
11	769.12	150.58	0.256	0.60(0.59)	0.99	20961.0	11000.00
12	884.75	173.10	0.235	0.60(0.60)	0.99	27752.1	10850.00
13	811.95	188.64	0.226	0.60(0.60)	0.99	31099.7	11220.00
14	756.14	199.92	0.223	0.60(0.60)	0.99	32854.9	10910.00
15	608.10	240.06	0.211	0.60(0.60)	0.99	39438.9	12410.00
16	574.05	272.86	0.201	0.60(0.59)	0.99	45517.1	12261.00
17	563.20	285.71	0.197	0.60(0.59)	0.99	47001.9	10410.00
18	552.49	297.85	0.194	0.60(0.59)	0.99	48107.7	12101.10
19	528.31	325.14	0.185	0.60(0.59)	0.99	50485.5	10200.00
20	515.84	338.47	0.181	0.60(0.59)	0.99	51425.1	12010.00
21	503.85	348.73	0.178	0.60(0.59)	0.99	51796.8	10300.00
22	479.06	367.68	0.174	0.60(0.59)	0.99	52102.5	10210.00
23	424.90	416.61	0.169	0.60(0.59)	0.99	52604.2	12000.00
24	392.92	483.49	0.161	0.60(0.59)	0.99	53172.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.12	50.76	0.448	0.60(0.57)	0.96	385.8	31200.00

LONGEST FLOWPATH FROM NODE 31200.00 TO NODE 12901.00 = 11169.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	472.72	16.27	0.900	0.60(0.59)	0.98	1364.1	50200.00
2	688.16	44.08	0.486	0.60(0.59)	0.98	4441.1	40510.00
3	674.08	47.19	0.468	0.60(0.59)	0.98	4958.9	50120.00
4	641.37	50.76	0.448	0.60(0.59)	0.99	5479.6	31200.00
5	640.49	50.86	0.447	0.60(0.59)	0.99	5492.4	50150.00
6	563.85	58.80	0.403	0.60(0.59)	0.99	6555.0	50100.00
7	541.28	62.69	0.391	0.60(0.59)	0.99	7071.1	31600.00
8	541.03	83.36	0.352	0.60(0.59)	0.99	10122.6	31400.00
9	544.38	94.88	0.330	0.60(0.59)	0.99	11762.4	40100.00
10	586.40	107.40	0.308	0.60(0.59)	0.99	13494.9	11831.00
11	688.47	130.90	0.275	0.60(0.59)	0.99	17190.0	11530.00
12	778.93	150.58	0.256	0.60(0.59)	0.99	21346.8	11000.00
13	893.75	173.10	0.235	0.60(0.60)	0.99	28137.8	10850.00
14	820.61	188.64	0.226	0.60(0.60)	0.99	31485.5	11220.00
15	764.67	199.92	0.223	0.60(0.60)	0.99	33240.7	10910.00
16	616.17	240.06	0.211	0.60(0.59)	0.99	39824.6	12410.00
17	581.74	272.86	0.201	0.60(0.59)	0.99	45902.9	12261.00
18	570.75	285.71	0.197	0.60(0.59)	0.99	47387.7	10410.00
19	559.90	297.85	0.194	0.60(0.59)	0.99	48493.4	12101.10
20	535.40	325.14	0.185	0.60(0.59)	0.99	50871.2	10200.00
21	522.78	338.47	0.181	0.60(0.59)	0.99	51810.9	12010.00
22	510.68	348.73	0.178	0.60(0.59)	0.99	52182.6	10300.00
23	485.72	367.68	0.174	0.60(0.59)	0.99	52488.3	10210.00
24	431.35	416.61	0.169	0.60(0.59)	0.99	52990.0	12000.00
25	399.09	483.49	0.161	0.60(0.59)	0.99	53558.4	10100.00

TOTAL AREA(ACRES) = 53558.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 893.75 Tc(MIN.) = 173.099
EFFECTIVE AREA(ACRES) = 28137.83 AREA-AVERAGED Fm(INCH/HR) = 0.60

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  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53558.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610503T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       19.18   36.15  0.60( 0.60) 0.99     366.1   50300.00
    TOTAL AREA(ACRES) =      366.1

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      472.72   16.27    0.900  0.60( 0.59) 0.98    1364.1   50200.00
      2      688.16   44.08    0.486  0.60( 0.59) 0.98    4441.1   40510.00
      3      674.08   47.19    0.468  0.60( 0.59) 0.98    4958.9   50120.00
      4      641.37   50.76    0.448  0.60( 0.59) 0.99    5479.6   31200.00
      5      640.49   50.86    0.447  0.60( 0.59) 0.99    5492.4   50150.00
      6      563.85   58.80    0.403  0.60( 0.59) 0.99    6555.0   50100.00
      7      541.28   62.69    0.391  0.60( 0.59) 0.99    7071.1   31600.00
      8      541.03   83.36    0.352  0.60( 0.59) 0.99   10122.6   31400.00
      9      544.38   94.88    0.330  0.60( 0.59) 0.99   11762.4   40100.00
     10      586.40  107.40    0.308  0.60( 0.59) 0.99   13494.9   11831.00
     11      688.47  130.90    0.275  0.60( 0.59) 0.99   17190.0   11530.00
     12      778.93  150.58    0.256  0.60( 0.59) 0.99   21346.8   11000.00
     13      893.75  173.10    0.235  0.60( 0.60) 0.99   28137.8   10850.00
     14      820.61  188.64    0.226  0.60( 0.60) 0.99   31485.5   11220.00
     15      764.67  199.92    0.223  0.60( 0.60) 0.99   33240.7   10910.00
     16      616.17  240.06    0.211  0.60( 0.59) 0.99   39824.6   12410.00
     17      581.74  272.86    0.201  0.60( 0.59) 0.99   45902.9   12261.00
     18      570.75  285.71    0.197  0.60( 0.59) 0.99   47387.7   10410.00
     19      559.90  297.85    0.194  0.60( 0.59) 0.99   48493.4   12101.10
     20      535.40  325.14    0.185  0.60( 0.59) 0.99   50871.2   10200.00
     21      522.78  338.47    0.181  0.60( 0.59) 0.99   51810.9   12010.00
     22      510.68  348.73    0.178  0.60( 0.59) 0.99   52182.6   10300.00
     23      485.72  367.68    0.174  0.60( 0.59) 0.99   52488.3   10210.00
     24      431.35  416.61    0.169  0.60( 0.59) 0.99   52990.0   12000.00
     25      399.09  483.49    0.161  0.60( 0.59) 0.99   53558.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.
```



```
  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       19.18   36.15    0.541  0.60( 0.60) 0.99     366.1   50300.00
  LONGEST FLOWPATH FROM NODE  50300.00 TO NODE  12901.00 =    8614.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      487.09   16.27    0.900  0.60( 0.59) 0.98    1528.9   50200.00
      2      645.94   36.15    0.541  0.60( 0.59) 0.98    3930.3   50300.00
      3      705.40   44.08    0.486  0.60( 0.59) 0.98    4807.2   40510.00
      4      690.69   47.19    0.468  0.60( 0.59) 0.99    5325.0   50120.00
      5      657.26   50.76    0.448  0.60( 0.59) 0.99    5845.7   31200.00
      6      656.36   50.86    0.447  0.60( 0.59) 0.99    5858.5   50150.00
      7      578.14   58.80    0.403  0.60( 0.59) 0.99    6921.1   50100.00
      8      555.15   62.69    0.391  0.60( 0.59) 0.99    7437.2   31600.00
      9      553.51   83.36    0.352  0.60( 0.59) 0.99   10488.7   31400.00
     10      556.10   94.88    0.330  0.60( 0.59) 0.99   12128.5   40100.00
     11      597.32  107.40    0.308  0.60( 0.59) 0.99   13861.0   11831.00
     12      698.23  130.90    0.275  0.60( 0.59) 0.99   17556.1   11530.00
     13      788.03  150.58    0.256  0.60( 0.59) 0.99   21712.9   11000.00
     14      902.11  173.10    0.235  0.60( 0.60) 0.99   28503.9   10850.00
     15      828.65  188.64    0.226  0.60( 0.60) 0.99   31851.6   11220.00
     16      772.58  199.92    0.223  0.60( 0.60) 0.99   33606.8   10910.00
     17      623.65  240.06    0.211  0.60( 0.59) 0.99   40190.7   12410.00
     18      588.88  272.86    0.201  0.60( 0.59) 0.99   46269.0   12261.00
     19      577.75  285.71    0.197  0.60( 0.59) 0.99   47753.8   10410.00
     20      566.77  297.85    0.194  0.60( 0.59) 0.99   48859.6   12101.10
     21      541.99  325.14    0.185  0.60( 0.59) 0.99   51237.3   10200.00
     22      529.22  338.47    0.181  0.60( 0.59) 0.99   52177.0   12010.00
     23      517.01  348.73    0.178  0.60( 0.59) 0.99   52548.7   10300.00
     24      491.90  367.68    0.174  0.60( 0.59) 0.99   52854.4   10210.00
     25      437.34  416.61    0.169  0.60( 0.59) 0.99   53356.1   12000.00
     26      404.81  483.49    0.161  0.60( 0.59) 0.99   53924.5   10100.00
    TOTAL AREA(ACRES) =     53924.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      902.11  Tc(MIN.) =  173.099
  EFFECTIVE AREA(ACRES) =  28503.94  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53924.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12902.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    216.00  DOWNSTREAM(FEET) =    215.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   122.04   CHANNEL SLOPE =  0.0082
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     902.11
  FLOW VELOCITY(FEET/SEC.) =   8.84   FLOW DEPTH(FEET) =   5.83
  TRAVEL TIME(MIN.) =   0.23   Tc(MIN.) =  173.33
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12902.00 =  115038.03 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      487.09   16.54    0.891  0.60( 0.59) 0.98    1528.9   50200.00
     2      645.94   36.40    0.539  0.60( 0.59) 0.98    3930.3   50300.00
     3      705.40   44.32    0.484  0.60( 0.59) 0.98    4807.2   40510.00
     4      690.69   47.43    0.467  0.60( 0.59) 0.99    5325.0   50120.00
     5      657.26   51.01    0.446  0.60( 0.59) 0.99    5845.7   31200.00
     6      656.36   51.11    0.446  0.60( 0.59) 0.99    5858.5   50150.00
     7      578.14   59.06    0.401  0.60( 0.59) 0.99    6921.1   50100.00
     8      555.15   62.95    0.390  0.60( 0.59) 0.99    7437.2   31600.00
     9      553.51   83.62    0.351  0.60( 0.59) 0.99   10488.7   31400.00
    10      556.10   95.14    0.330  0.60( 0.59) 0.99   12128.5   40100.00
    11      597.32  107.65    0.307  0.60( 0.59) 0.99   13861.0   11831.00
    12      698.23  131.15    0.275  0.60( 0.59) 0.99   17556.1   11530.00
    13      788.03  150.82    0.256  0.60( 0.59) 0.99   21712.9   11000.00
    14      902.11  173.33    0.235  0.60( 0.60) 0.99   28503.9   10850.00
    15      828.65  188.88    0.226  0.60( 0.60) 0.99   31851.6   11220.00
    16      772.58  200.16    0.223  0.60( 0.60) 0.99   33606.8   10910.00
    17      623.65  240.31    0.211  0.60( 0.59) 0.99   40190.7   12410.00
    18      588.88  273.12    0.201  0.60( 0.59) 0.99   46269.0   12261.00
    19      577.75  285.97    0.197  0.60( 0.59) 0.99   47753.8   10410.00
    20      566.77  298.10    0.194  0.60( 0.59) 0.99   48859.6   12101.10
    21      541.99  325.41    0.185  0.60( 0.59) 0.99   51237.3   10200.00
    22      529.22  338.73    0.181  0.60( 0.59) 0.99   52177.0   12010.00
    23      517.01  348.99    0.178  0.60( 0.59) 0.99   52548.7   10300.00
    24      491.90  367.95    0.174  0.60( 0.59) 0.99   52854.4   10210.00
    25      437.34  416.89    0.169  0.60( 0.59) 0.99   53356.1   12000.00
    26      404.81  483.77    0.161  0.60( 0.59) 0.99   53924.5   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     902.11  Tc(MIN.) =  173.33
 AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   28503.94

****************************************************************************
 FLOW PROCESS FROM NODE  12902.00 TO NODE  12902.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12902.00 TO NODE  12903.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    215.00  DOWNSTREAM(FEET) =    214.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   895.53   CHANNEL SLOPE =  0.0011
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 CHANNEL FLOW THRU SUBAREA(CFS) =     902.11
 FLOW VELOCITY(FEET/SEC.) =   4.19   FLOW DEPTH(FEET) =   8.47
 TRAVEL TIME(MIN.) =   3.56   Tc(MIN.) =  176.89
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12903.00 =  115933.56 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      487.09   20.69    0.758  0.60( 0.59) 0.98    1528.9   50200.00
     2      645.94   40.28    0.507  0.60( 0.59) 0.98    3930.3   50300.00
     3      705.40   48.11    0.463  0.60( 0.59) 0.98    4807.2   40510.00
     4      690.69   51.25    0.445  0.60( 0.59) 0.99    5325.0   50120.00
     5      657.26   54.87    0.425  0.60( 0.59) 0.99    5845.7   31200.00
     6      656.36   54.97    0.424  0.60( 0.59) 0.99    5858.5   50150.00
     7      578.14   63.05    0.390  0.60( 0.59) 0.99    6921.1   50100.00
     8      555.15   66.98    0.383  0.60( 0.59) 0.99    7437.2   31600.00
     9      553.51   87.65    0.343  0.60( 0.59) 0.99   10488.7   31400.00
    10      556.10   99.16    0.323  0.60( 0.59) 0.99   12128.5   40100.00
    11      597.32  111.60    0.300  0.60( 0.59) 0.99   13861.0   11831.00
    12      698.23  134.95    0.271  0.60( 0.59) 0.99   17556.1   11530.00
    13      788.03  154.51    0.253  0.60( 0.59) 0.99   21712.9   11000.00
    14      902.11  176.89    0.232  0.60( 0.60) 0.99   28503.9   10850.00
    15      828.65  192.52    0.225  0.60( 0.60) 0.99   31851.6   11220.00
    16      772.58  203.87    0.222  0.60( 0.60) 0.99   33606.8   10910.00
    17      623.65  244.22    0.210  0.60( 0.59) 0.99   40190.7   12410.00
    18      588.88  277.09    0.200  0.60( 0.59) 0.99   46269.0   12261.00
    19      577.75  289.96    0.196  0.60( 0.59) 0.99   47753.8   10410.00
    20      566.77  302.11    0.192  0.60( 0.59) 0.99   48859.6   12101.10
    21      541.99  329.45    0.184  0.60( 0.59) 0.99   51237.3   10200.00
    22      529.22  342.80    0.180  0.60( 0.59) 0.99   52177.0   12010.00
    23      517.01  353.09    0.177  0.60( 0.59) 0.99   52548.7   10300.00
    24      491.90  372.10    0.174  0.60( 0.59) 0.99   52854.4   10210.00
    25      437.34  421.16    0.168  0.60( 0.59) 0.99   53356.1   12000.00
    26      404.81  488.13    0.161  0.60( 0.59) 0.99   53924.5   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     902.11  Tc(MIN.) =  176.89
 AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   28503.94

****************************************************************************
 FLOW PROCESS FROM NODE  12902.00 TO NODE  12903.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12903.00 TO NODE  12903.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610504T.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
     1       12.19   20.43  0.60( 0.58) 0.97      70.7   50400.00
   TOTAL AREA(ACRES) =       70.7

****************************************************************************
 FLOW PROCESS FROM NODE  12903.00 TO NODE  12903.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	487.09	20.69	0.758	0.60(0.59)	0.98	1528.9	50200.00
2	645.94	40.28	0.507	0.60(0.59)	0.98	3930.3	50300.00
3	705.40	48.11	0.463	0.60(0.59)	0.98	4807.2	40510.00
4	690.69	51.25	0.445	0.60(0.59)	0.99	5325.0	50120.00
5	657.26	54.87	0.425	0.60(0.59)	0.99	5845.7	31200.00
6	656.36	54.97	0.424	0.60(0.59)	0.99	5858.5	50150.00
7	578.14	63.05	0.390	0.60(0.59)	0.99	6921.1	50100.00
8	555.15	66.98	0.383	0.60(0.59)	0.99	7437.2	31600.00
9	553.51	87.65	0.343	0.60(0.59)	0.99	10488.7	31400.00
10	556.10	99.16	0.323	0.60(0.59)	0.99	12128.5	40100.00
11	597.32	111.60	0.300	0.60(0.59)	0.99	13861.0	11831.00
12	698.23	134.95	0.271	0.60(0.59)	0.99	17556.1	11530.00
13	788.03	154.51	0.253	0.60(0.59)	0.99	21712.9	11000.00
14	902.11	176.89	0.232	0.60(0.60)	0.99	28503.9	10850.00
15	828.65	192.52	0.225	0.60(0.60)	0.99	31851.6	11220.00
16	772.58	203.87	0.222	0.60(0.60)	0.99	33606.8	10910.00
17	623.65	244.22	0.210	0.60(0.59)	0.99	40190.7	12410.00
18	588.88	277.09	0.200	0.60(0.59)	0.99	46269.0	12261.00
19	577.75	289.96	0.196	0.60(0.59)	0.99	47753.8	10410.00
20	566.77	302.11	0.192	0.60(0.59)	0.99	48859.6	12101.10
21	541.99	329.45	0.184	0.60(0.59)	0.99	51237.3	10200.00
22	529.22	342.80	0.180	0.60(0.59)	0.99	52177.0	12010.00
23	517.01	353.09	0.177	0.60(0.59)	0.99	52548.7	10300.00
24	491.90	372.10	0.174	0.60(0.59)	0.99	52854.4	10210.00
25	437.34	421.16	0.168	0.60(0.59)	0.99	53356.1	12000.00
26	404.81	488.13	0.161	0.60(0.59)	0.99	53924.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.19	20.43	0.764	0.60(0.58)	0.97	70.7	50400.00

LONGEST FLOWPATH FROM NODE 50400.00 TO NODE 12903.00 = 3607.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	499.28	20.43	0.764	0.60(0.59)	0.98	1580.2	50400.00
2	498.90	20.69	0.758	0.60(0.59)	0.98	1599.6	50200.00
3	646.82	40.28	0.507	0.60(0.59)	0.98	4000.9	50300.00
4	706.20	48.11	0.463	0.60(0.59)	0.98	4877.9	40510.00
5	691.46	51.25	0.445	0.60(0.59)	0.98	5395.7	50120.00
6	658.00	54.87	0.425	0.60(0.59)	0.99	5916.4	31200.00
7	657.10	54.97	0.424	0.60(0.59)	0.99	5929.2	50150.00
8	578.81	63.05	0.390	0.60(0.59)	0.99	6991.8	50100.00
9	555.82	66.98	0.383	0.60(0.59)	0.99	7507.9	31600.00
10	554.10	87.65	0.343	0.60(0.59)	0.99	10559.4	31400.00
11	556.66	99.16	0.323	0.60(0.59)	0.99	12199.2	40100.00
12	597.84	111.60	0.300	0.60(0.59)	0.99	13931.7	11831.00
13	698.70	134.95	0.271	0.60(0.59)	0.99	17626.8	11530.00
14	788.47	154.51	0.253	0.60(0.59)	0.99	21783.5	11000.00
15	902.51	176.89	0.232	0.60(0.60)	0.99	28574.6	10850.00
16	829.04	192.52	0.225	0.60(0.60)	0.99	31922.2	11220.00
17	772.97	203.87	0.222	0.60(0.60)	0.99	33677.5	10910.00
18	624.02	244.22	0.210	0.60(0.59)	0.99	40261.4	12410.00
19	589.23	277.09	0.200	0.60(0.59)	0.99	46339.7	12261.00
20	578.09	289.96	0.196	0.60(0.59)	0.99	47824.5	10410.00

21	567.10	302.11	0.192	0.60(0.59)	0.99	48930.2	12101.10
22	542.30	329.45	0.184	0.60(0.59)	0.99	51308.0	10200.00
23	529.53	342.80	0.180	0.60(0.59)	0.99	52247.7	12010.00
24	517.31	353.09	0.177	0.60(0.59)	0.99	52619.4	10300.00
25	492.20	372.10	0.174	0.60(0.59)	0.99	52925.1	10210.00
26	437.63	421.16	0.168	0.60(0.59)	0.99	53426.8	12000.00
27	405.09	488.13	0.161	0.60(0.59)	0.99	53995.2	10100.00

TOTAL AREA(ACRES) = 53995.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 902.51 Tc(MIN.) = 176.893
EFFECTIVE AREA(ACRES) = 28574.62 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53995.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12904.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 214.00 DOWNSTREAM(FEET) = 213.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 767.57 CHANNEL SLOPE = 0.0013
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 902.51
FLOW VELOCITY(FEET/SEC.) = 4.43 FLOW DEPTH(FEET) = 8.24
TRAVEL TIME(MIN.) = 2.89 Tc(MIN.) = 179.78
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	499.28	23.78	0.692	0.60(0.59)	0.98	1580.2	50400.00
2	498.90	24.04	0.687	0.60(0.59)	0.98	1599.6	50200.00
3	646.82	43.41	0.490	0.60(0.59)	0.98	4000.9	50300.00
4	706.20	51.18	0.445	0.60(0.59)	0.98	4877.9	40510.00
5	691.46	54.33	0.428	0.60(0.59)	0.98	5395.7	50120.00
6	658.00	57.99	0.407	0.60(0.59)	0.99	5916.4	31200.00
7	657.10	58.09	0.407	0.60(0.59)	0.99	5929.2	50150.00
8	578.81	66.27	0.384	0.60(0.59)	0.99	6991.8	50100.00
9	555.82	70.24	0.377	0.60(0.59)	0.99	7507.9	31600.00
10	554.10	90.91	0.337	0.60(0.59)	0.99	10559.4	31400.00
11	556.66	102.42	0.317	0.60(0.59)	0.99	12199.2	40100.00
12	597.84	114.80	0.294	0.60(0.59)	0.99	13931.7	11831.00
13	698.70	138.03	0.268	0.60(0.59)	0.99	17626.8	11530.00
14	788.47	157.50	0.250	0.60(0.59)	0.99	21783.5	11000.00
15	902.51	179.78	0.229	0.60(0.60)	0.99	28574.6	10850.00
16	829.04	195.47	0.224	0.60(0.60)	0.99	31922.2	11220.00
17	772.97	206.87	0.221	0.60(0.60)	0.99	33677.5	10910.00
18	624.02	247.39	0.209	0.60(0.59)	0.99	40261.4	12410.00
19	589.23	280.30	0.199	0.60(0.59)	0.99	46339.7	12261.00
20	578.09	293.18	0.195	0.60(0.59)	0.99	47824.5	10410.00
21	567.10	305.35	0.191	0.60(0.59)	0.99	48930.2	12101.10
22	542.30	332.73	0.183	0.60(0.59)	0.99	51308.0	10200.00
23	529.53	346.10	0.179	0.60(0.59)	0.99	52247.7	12010.00
24	517.31	356.41	0.176	0.60(0.59)	0.99	52619.4	10300.00

```
    25      492.20  375.45    0.173  0.60( 0.59) 0.99   52925.1   10210.00
    26      437.63  424.61    0.168  0.60( 0.59) 0.99   53426.8   12000.00
    27      405.09  491.65    0.160  0.60( 0.59) 0.99   53995.2   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     902.51  Tc(MIN.) =  179.78
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   28574.62

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610311T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM        Q       Tc       Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.)   (INCH/HR)           (ACRES)     NODE
      1         4.65   43.71   0.60( 0.58) 0.97      114.8   31100.00
    TOTAL AREA(ACRES) =       114.8

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q       Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR)  (INCH/HR)           (ACRES)     NODE
      1       499.28   23.78     0.692  0.60( 0.59) 0.98    1580.2   50400.00
      2       498.90   24.04     0.687  0.60( 0.59) 0.98    1599.6   50200.00
      3       646.82   43.41     0.490  0.60( 0.59) 0.98    4000.9   50300.00
      4       706.20   51.18     0.445  0.60( 0.59) 0.98    4877.9   40510.00
      5       691.46   54.33     0.428  0.60( 0.59) 0.98    5395.7   50120.00
      6       658.00   57.99     0.407  0.60( 0.59) 0.99    5916.4   31200.00
      7       657.10   58.09     0.407  0.60( 0.59) 0.99    5929.2   50150.00
      8       578.81   66.27     0.384  0.60( 0.59) 0.99    6991.8   50100.00
      9       555.82   70.24     0.377  0.60( 0.59) 0.99    7507.9   31600.00
     10       554.10   90.91     0.337  0.60( 0.59) 0.99   10559.4   31400.00
     11       556.66  102.42     0.317  0.60( 0.59) 0.99   12199.2   40100.00
     12       597.84  114.80     0.294  0.60( 0.59) 0.99   13931.7   11831.00
     13       698.70  138.03     0.268  0.60( 0.59) 0.99   17626.8   11530.00
     14       788.47  157.50     0.250  0.60( 0.59) 0.99   21783.5   11000.00
     15       902.51  179.78     0.229  0.60( 0.60) 0.99   28574.6   10850.00
     16       829.04  195.47     0.224  0.60( 0.60) 0.99   31922.2   11220.00
     17       772.97  206.87     0.221  0.60( 0.60) 0.99   33677.5   10910.00
     18       624.02  247.39     0.209  0.60( 0.59) 0.99   40261.4   12410.00
     19       589.23  280.30     0.199  0.60( 0.59) 0.99   46339.7   12261.00
     20       578.09  293.18     0.195  0.60( 0.59) 0.99   47824.5   10410.00
     21       567.10  305.35     0.191  0.60( 0.59) 0.99   48930.2   12101.10
     22       542.30  332.73     0.183  0.60( 0.59) 0.99   51308.0   10200.00
     23       529.53  346.10     0.179  0.60( 0.59) 0.99   52247.7   12010.00
```



```
    24      517.31  356.41    0.176  0.60( 0.59) 0.99   52619.4   10300.00
    25      492.20  375.45    0.173  0.60( 0.59) 0.99   52925.1   10210.00
    26      437.63  424.61    0.168  0.60( 0.59) 0.99   53426.8   12000.00
    27      405.09  491.65    0.160  0.60( 0.59) 0.99   53995.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12904.00 =  116701.13 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM        Q       Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR)  (INCH/HR)           (ACRES)     NODE
      1         4.65   43.71     0.488  0.60( 0.58) 0.97      114.8   31100.00
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  12904.00 =    6503.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q       Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR)  (INCH/HR)           (ACRES)     NODE
      1       503.93   23.78     0.692  0.60( 0.59) 0.98    1642.7   50400.00
      2       503.55   24.04     0.687  0.60( 0.59) 0.98    1662.7   50200.00
      3       651.45   43.41     0.490  0.60( 0.59) 0.98    4115.0   50300.00
      4       653.77   43.71     0.488  0.60( 0.59) 0.98    4149.8   31100.00
      5       710.45   51.18     0.445  0.60( 0.59) 0.98    4992.7   40510.00
      6       695.54   54.33     0.428  0.60( 0.59) 0.98    5510.5   50120.00
      7       661.88   57.99     0.407  0.60( 0.59) 0.99    6031.2   31200.00
      8       660.97   58.09     0.407  0.60( 0.59) 0.99    6044.0   50150.00
      9       582.48   66.27     0.384  0.60( 0.59) 0.99    7106.6   50100.00
     10       559.40   70.24     0.377  0.60( 0.59) 0.99    7622.7   31600.00
     11       557.32   90.91     0.337  0.60( 0.59) 0.99   10674.2   31400.00
     12       559.68  102.42     0.317  0.60( 0.59) 0.99   12314.0   40100.00
     13       600.65  114.80     0.294  0.60( 0.59) 0.99   14046.5   11831.00
     14       701.25  138.03     0.268  0.60( 0.59) 0.99   17741.6   11530.00
     15       790.85  157.50     0.250  0.60( 0.59) 0.99   21898.4   11000.00
     16       904.69  179.78     0.229  0.60( 0.60) 0.99   28689.4   10850.00
     17       831.17  195.47     0.224  0.60( 0.60) 0.99   32037.1   11220.00
     18       775.07  206.87     0.221  0.60( 0.60) 0.99   33792.3   10910.00
     19       626.01  247.39     0.209  0.60( 0.59) 0.99   40376.2   12410.00
     20       591.12  280.30     0.199  0.60( 0.59) 0.99   46454.5   12261.00
     21       579.95  293.18     0.195  0.60( 0.59) 0.99   47939.3   10410.00
     22       568.93  305.35     0.191  0.60( 0.59) 0.99   49045.1   12101.10
     23       544.05  332.73     0.183  0.60( 0.59) 0.99   51422.8   10200.00
     24       531.24  346.10     0.179  0.60( 0.59) 0.99   52362.5   12010.00
     25       518.99  356.41     0.176  0.60( 0.59) 0.99   52734.2   10300.00
     26       493.85  375.45     0.173  0.60( 0.59) 0.99   53039.9   10210.00
     27       439.23  424.61     0.168  0.60( 0.59) 0.99   53541.6   12000.00
     28       406.62  491.65     0.160  0.60( 0.59) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =     54110.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      904.69  Tc(MIN.) =  179.779
  EFFECTIVE AREA(ACRES) =  28689.43  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    54110.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12904.00 =  116701.13 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    54110.0  TC(MIN.) =    179.78
  EFFECTIVE AREA(ACRES) =  28689.43  AREA-AVERAGED Fm(INCH/HR)=  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.993
  PEAK FLOW RATE(CFS)   =     904.69
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	503.93	23.78	0.692	0.60(0.59)	0.98	1642.7	50400.00
2	503.55	24.04	0.687	0.60(0.59)	0.98	1662.7	50200.00
3	651.45	43.41	0.490	0.60(0.59)	0.98	4115.0	50300.00
4	653.77	43.71	0.488	0.60(0.59)	0.98	4149.8	31100.00
5	710.45	51.18	0.445	0.60(0.59)	0.98	4992.7	40510.00
6	695.54	54.33	0.428	0.60(0.59)	0.98	5510.5	50120.00
7	661.88	57.99	0.407	0.60(0.59)	0.99	6031.2	31200.00
8	660.97	58.09	0.407	0.60(0.59)	0.99	6044.0	50150.00
9	582.48	66.27	0.384	0.60(0.59)	0.99	7106.6	50100.00
10	559.40	70.24	0.377	0.60(0.59)	0.99	7622.7	31600.00
11	557.32	90.91	0.337	0.60(0.59)	0.99	10674.2	31400.00
12	559.68	102.42	0.317	0.60(0.59)	0.99	12314.0	40100.00
13	600.65	114.80	0.294	0.60(0.59)	0.99	14046.5	11831.00
14	701.25	138.03	0.268	0.60(0.59)	0.99	17741.6	11530.00
15	790.85	157.50	0.250	0.60(0.59)	0.99	21898.4	11000.00
16	904.69	179.78	0.229	0.60(0.60)	0.99	28689.4	10850.00
17	831.17	195.47	0.224	0.60(0.60)	0.99	32037.1	11220.00
18	775.07	206.87	0.221	0.60(0.60)	0.99	33792.3	10910.00
19	626.01	247.39	0.209	0.60(0.59)	0.99	40376.2	12410.00
20	591.12	280.30	0.199	0.60(0.59)	0.99	46454.5	12261.00
21	579.95	293.18	0.195	0.60(0.59)	0.99	47939.3	10410.00
22	568.93	305.35	0.191	0.60(0.59)	0.99	49045.1	12101.10
23	544.05	332.73	0.183	0.60(0.59)	0.99	51422.8	10200.00
24	531.24	346.10	0.179	0.60(0.59)	0.99	52362.5	12010.00
25	518.99	356.41	0.176	0.60(0.59)	0.99	52734.2	10300.00
26	493.85	375.45	0.173	0.60(0.59)	0.99	53039.9	10210.00
27	439.23	424.61	0.168	0.60(0.59)	0.99	53541.6	12000.00
28	406.62	491.65	0.160	0.60(0.59)	0.99	54110.0	10100.00

END OF RATIONAL METHOD ANALYSIS

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S30.DAT
  TIME/DATE OF STUDY: 14:37 04/03/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.596
   2)   10.00;  1.064
   3)   15.00;  0.843
   4)   20.00;  0.715
   5)   25.00;  0.629
   6)   30.00;  0.560
   7)   40.00;  0.480
   8)   50.00;  0.423
   9)   60.00;  0.371
  10)   90.00;  0.302
  11)  120.00;  0.256
  12)  180.00;  0.208
  13)  360.00;  0.142
  14) 1440.00;  0.060
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  13000.00 TO NODE  13001.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   279.24
  ELEVATION DATA: UPSTREAM(FEET) =   1187.54  DOWNSTREAM(FEET) =   1104.45

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.560
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.217
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.65      0.60     1.000     0    8.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.65   PEAK FLOW RATE(CFS) =      0.36

 ************************************************************************
  FLOW PROCESS FROM NODE  13001.00 TO NODE  13002.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1104.45  DOWNSTREAM(FEET) =   1034.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   736.73   CHANNEL SLOPE =  0.0945
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.036
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       19.74      0.60     0.968     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.968
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.91
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   2.08
  Tc(MIN.) =   10.64
  SUBAREA AREA(ACRES) =    19.74       SUBAREA RUNOFF(CFS) =    8.09
  EFFECTIVE AREA(ACRES) =     20.39     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =       8.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   6.87
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13002.00 =    1015.97 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  13002.00 TO NODE  13003.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1034.82  DOWNSTREAM(FEET) =    986.71
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1305.95   CHANNEL SLOPE =  0.0368
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.878
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       83.90      0.60     0.904     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.28
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
 AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   3.57
 Tc(MIN.) =   14.21
 SUBAREA AREA(ACRES) =    83.90       SUBAREA RUNOFF(CFS) =   25.35
 EFFECTIVE AREA(ACRES) =    104.29     AREA-AVERAGED Fm(INCH/HR) =   0.55
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.92
 TOTAL AREA(ACRES) =      104.3         PEAK FLOW RATE(CFS) =      30.79

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.24   FLOW VELOCITY(FEET/SEC.) =   6.67
 LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13003.00 =    2321.92 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13003.00 TO NODE  13004.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    986.71  DOWNSTREAM(FEET) =    939.06
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.54   CHANNEL SLOPE =  0.0361
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.782
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       47.44      0.60     0.871     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.871
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.34
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.90
 AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   3.18
 Tc(MIN.) =   17.39
 SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   11.07
 EFFECTIVE AREA(ACRES) =    151.73     AREA-AVERAGED Fm(INCH/HR) =   0.54
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.90
 TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =      32.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.28   FLOW VELOCITY(FEET/SEC.) =   6.71
 LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13004.00 =    3640.46 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



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 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    939.06  DOWNSTREAM(FEET) =    861.53
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1954.61   CHANNEL SLOPE =  0.0397
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.683
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       77.87      0.60     0.856     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.856
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.82
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.29
 AVERAGE FLOW DEPTH(FEET) =   1.33   TRAVEL TIME(MIN.) =   4.47
 Tc(MIN.) =   21.86
 SUBAREA AREA(ACRES) =    77.87       SUBAREA RUNOFF(CFS) =   11.88
 EFFECTIVE AREA(ACRES) =    229.60     AREA-AVERAGED Fm(INCH/HR) =   0.53
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.89
 TOTAL AREA(ACRES) =      229.6         PEAK FLOW RATE(CFS) =      32.84
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) =   6.96
 LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13020.00 =    5595.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   21.86
 RAINFALL INTENSITY(INCH/HR) =   0.68
 AREA-AVERAGED Fm(INCH/HR) =  0.53
 AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.89
 EFFECTIVE STREAM AREA(ACRES) =     229.60
 TOTAL STREAM AREA(ACRES) =     229.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      32.84

****************************************************************************
 FLOW PROCESS FROM NODE  13010.00 TO NODE  13011.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   284.64
 ELEVATION DATA: UPSTREAM(FEET) =   1190.91  DOWNSTREAM(FEET) =   1110.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.716
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.201
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.91      0.60     1.000     0    8.72
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.49
  TOTAL AREA(ACRES) =      0.91   PEAK FLOW RATE(CFS) =      0.49

****************************************************************************
  FLOW PROCESS FROM NODE  13011.00 TO NODE  13012.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1110.50  DOWNSTREAM ELEVATION(FEET) = 1068.16
  STREET LENGTH(FEET) =   581.12   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.53
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    2.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
  STREET FLOW TRAVEL TIME(MIN.) =   1.65   Tc(MIN.) =   10.37
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.048
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.46      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   10.46      SUBAREA RUNOFF(CFS) =    4.22
  EFFECTIVE AREA(ACRES) =     11.37    AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =       11.4        PEAK FLOW RATE(CFS) =       4.58

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   5.47
  FLOW VELOCITY(FEET/SEC.) =  4.97   DEPTH*VELOCITY(FT*FT/SEC.) =   1.29
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13012.00 =     865.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13012.00 TO NODE  13013.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1068.16  DOWNSTREAM ELEVATION(FEET) =  994.58
  STREET LENGTH(FEET) =  1505.98   CURB HEIGHT(INCHES) =  8.0
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  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =    9.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.75
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.56
  STREET FLOW TRAVEL TIME(MIN.) =   5.29   Tc(MIN.) =   15.65
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.826
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.49      0.60     0.901     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.901
  SUBAREA AREA(ACRES) =   35.49      SUBAREA RUNOFF(CFS) =    9.13
  EFFECTIVE AREA(ACRES) =     46.86    AREA-AVERAGED Fm(INCH/HR) =  0.55
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.93
  TOTAL AREA(ACRES) =       46.9        PEAK FLOW RATE(CFS) =      11.44

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =  10.35
  FLOW VELOCITY(FEET/SEC.) =  4.97   DEPTH*VELOCITY(FT*FT/SEC.) =   1.73
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13013.00 =    2371.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13013.00 TO NODE  13014.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    994.58  DOWNSTREAM(FEET) =    944.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1798.86   CHANNEL SLOPE =  0.0276
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.696
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.31      0.60     0.616     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.616
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.52
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   5.44
  Tc(MIN.) =   21.09
  SUBAREA AREA(ACRES) =    73.31       SUBAREA RUNOFF(CFS) =   21.56
  EFFECTIVE AREA(ACRES) =    120.17     AREA-AVERAGED Fm(INCH/HR) =   0.44
```

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  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.74
  TOTAL AREA(ACRES) =      120.2         PEAK FLOW RATE(CFS) =      27.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   5.82
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13014.00 =    4170.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    944.96  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1519.40   CHANNEL SLOPE =  0.0549
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.641
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.22      0.60     0.810     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.810
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.87
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =   24.31
  SUBAREA AREA(ACRES) =    80.22       SUBAREA RUNOFF(CFS) =   11.19
  EFFECTIVE AREA(ACRES) =    200.39     AREA-AVERAGED Fm(INCH/HR) =   0.46
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      200.4         PEAK FLOW RATE(CFS) =      32.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.18   FLOW VELOCITY(FEET/SEC.) =   7.86
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.31
  RAINFALL INTENSITY(INCH/HR) =   0.64
  AREA-AVERAGED Fm(INCH/HR) =  0.46
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.77
  EFFECTIVE STREAM AREA(ACRES) =     200.39
  TOTAL STREAM AREA(ACRES) =     200.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      32.72

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       32.84   21.86    0.683  0.60( 0.53) 0.89     229.6   13000.00
```



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      2       32.72   24.31    0.641  0.60( 0.46) 0.77     200.4   13010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       65.56   21.86    0.683  0.60( 0.50) 0.83     409.8   13000.00
      2       56.41   24.31    0.641  0.60( 0.50) 0.83     430.0   13010.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      65.56    Tc(MIN.) =    21.86
  EFFECTIVE AREA(ACRES) =     409.81   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =      430.0
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13020.00 TO NODE  13021.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    861.53  DOWNSTREAM(FEET) =    843.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1274.71   CHANNEL SLOPE =  0.0139
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.621
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.78      0.60     0.818     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.818
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.67
  AVERAGE FLOW DEPTH(FEET) =   2.03   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   25.60
  SUBAREA AREA(ACRES) =    80.78       SUBAREA RUNOFF(CFS) =    9.45
  EFFECTIVE AREA(ACRES) =    490.59     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =      510.8         PEAK FLOW RATE(CFS) =      65.56
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.98   FLOW VELOCITY(FEET/SEC.) =   5.58
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13021.00 =    6964.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       65.56   25.60    0.621  0.60( 0.50) 0.83     490.6   13000.00
      2       56.41   28.20    0.585  0.60( 0.50) 0.83     510.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      65.56  Tc(MIN.) =   25.60
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     490.59
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13021.00 TO NODE  13022.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    843.84  DOWNSTREAM(FEET) =    842.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1448.62   CHANNEL SLOPE =  0.0012
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.510
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.44      0.60     0.803     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.803
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      71.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.26
  AVERAGE FLOW DEPTH(FEET) =   3.24   TRAVEL TIME(MIN.) =  10.68
  Tc(MIN.) =   36.28
  SUBAREA AREA(ACRES) =   124.44       SUBAREA RUNOFF(CFS) =   11.25
  EFFECTIVE AREA(ACRES) =    615.03     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.83
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      635.2         PEAK FLOW RATE(CFS) =      65.56
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.14   FLOW VELOCITY(FEET/SEC.) =   2.22
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13022.00 =    8413.33 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       65.56   36.28    0.510  0.60( 0.50) 0.83     615.0   13000.00
      2       56.41   39.26    0.486  0.60( 0.49) 0.82     635.2   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      65.56  Tc(MIN.) =   36.28
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     615.03

****************************************************************************
  FLOW PROCESS FROM NODE  13022.00 TO NODE  13023.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    842.14  DOWNSTREAM(FEET) =    806.85
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.95   CHANNEL SLOPE =  0.0246
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.484
  SUBAREA LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      324.46      0.60     0.786     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.786
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      80.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.30
  AVERAGE FLOW DEPTH(FEET) =   1.92   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   39.56
  SUBAREA AREA(ACRES) =   324.46       SUBAREA RUNOFF(CFS) =   30.22
  EFFECTIVE AREA(ACRES) =    939.49     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.81
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      959.7         PEAK FLOW RATE(CFS) =      76.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.89   FLOW VELOCITY(FEET/SEC.) =   7.20
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13023.00 =    9846.28 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       76.96   39.56    0.484  0.60( 0.49) 0.81     939.5   13000.00
      2       75.98   42.64    0.465  0.60( 0.49) 0.81     959.7   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      76.96  Tc(MIN.) =   39.56
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =     939.49

****************************************************************************
  FLOW PROCESS FROM NODE  13023.00 TO NODE  13024.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    806.85  DOWNSTREAM(FEET) =    767.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.17   CHANNEL SLOPE =  0.0423
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.473
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      367.12      0.60     0.795     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.795
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      92.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.27
  AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   1.69
  Tc(MIN.) =   41.25
  SUBAREA AREA(ACRES) =   367.12       SUBAREA RUNOFF(CFS) =   32.03
  EFFECTIVE AREA(ACRES) =   1306.61     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.81
```

```
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1326.8         PEAK FLOW RATE(CFS) =     107.30

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   9.63
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13024.00 =   10786.45 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      107.30   41.25    0.473  0.60( 0.48) 0.81    1306.6   13000.00
     2      105.24   44.34    0.455  0.60( 0.48) 0.81    1326.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     107.30  Tc(MIN.) =   41.25
 AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1306.61

****************************************************************************
 FLOW PROCESS FROM NODE  13024.00 TO NODE  13025.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    767.07  DOWNSTREAM(FEET) =    697.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3026.62   CHANNEL SLOPE =  0.0230
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.436
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      315.24      0.60     0.867     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     115.53
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.79
 AVERAGE FLOW DEPTH(FEET) =   2.22   TRAVEL TIME(MIN.) =   6.47
 Tc(MIN.) =   47.72
 SUBAREA AREA(ACRES) =   315.24       SUBAREA RUNOFF(CFS) =   16.45
 EFFECTIVE AREA(ACRES) =   1621.85     AREA-AVERAGED Fm(INCH/HR) =   0.49
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.82
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     1642.0         PEAK FLOW RATE(CFS) =     115.38

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.22   FLOW VELOCITY(FEET/SEC.) =   7.78
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13025.00 =   13813.07 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      115.38   47.72    0.436  0.60( 0.49) 0.82    1621.8   13000.00
     2      112.54   50.86    0.419  0.60( 0.49) 0.82    1642.0   13010.00
 NEW PEAK FLOW DATA ARE:
```



```
 PEAK FLOW RATE(CFS) =     115.38  Tc(MIN.) =   47.72
 AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    1621.85

****************************************************************************
 FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    697.38  DOWNSTREAM(FEET) =    662.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.69   CHANNEL SLOPE =  0.0147
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.405
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      374.11      0.60     0.748     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.748
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     132.54
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.82
 AVERAGE FLOW DEPTH(FEET) =   2.55   TRAVEL TIME(MIN.) =   5.77
 Tc(MIN.) =   53.49
 SUBAREA AREA(ACRES) =   374.11       SUBAREA RUNOFF(CFS) =   34.35
 EFFECTIVE AREA(ACRES) =   1995.96     AREA-AVERAGED Fm(INCH/HR) =   0.48
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.81
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     2016.1         PEAK FLOW RATE(CFS) =     141.48

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.61   FLOW VELOCITY(FEET/SEC.) =   6.91
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13026.00 =   16175.76 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      141.48   53.49    0.405  0.60( 0.48) 0.81    1996.0   13000.00
     2      137.35   56.68    0.388  0.60( 0.48) 0.81    2016.1   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     141.48  Tc(MIN.) =   53.49
 AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1995.96
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     2016.1  TC(MIN.) =     53.49
 EFFECTIVE AREA(ACRES) =   1995.96  AREA-AVERAGED Fm(INCH/HR)=  0.48
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.805
 PEAK FLOW RATE(CFS)   =     141.48

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      141.48   53.49    0.405  0.60( 0.48) 0.81    1996.0   13000.00
```

```
      2      137.35    56.68     0.388  0.60( 0.48) 0.81     2016.1    13010.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S31.DAT
  TIME/DATE OF STUDY: 14:37 04/03/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.596
   2)   10.00;  1.064
   3)   15.00;  0.843
   4)   20.00;  0.715
   5)   25.00;  0.629
   6)   30.00;  0.560
   7)   40.00;  0.480
   8)   50.00;  0.423
   9)   60.00;  0.371
  10)   90.00;  0.302
  11)  120.00;  0.256
  12)  180.00;  0.208
  13)  360.00;  0.142
  14) 1440.00;  0.060
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  13100.00 TO NODE  13101.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   282.58
  ELEVATION DATA: UPSTREAM(FEET) =   1069.66  DOWNSTREAM(FEET) =    969.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.312
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.244
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.94      0.60     1.000     0    8.31
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.94   PEAK FLOW RATE(CFS) =      0.54

 ************************************************************************
  FLOW PROCESS FROM NODE  13101.00 TO NODE  13102.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    969.92  DOWNSTREAM(FEET) =    807.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.89   CHANNEL SLOPE =  0.2444
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.018
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.67      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.07
  AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   11.04
  SUBAREA AREA(ACRES) =     7.67       SUBAREA RUNOFF(CFS) =    2.89
  EFFECTIVE AREA(ACRES) =      8.61     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.6         PEAK FLOW RATE(CFS) =       3.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   4.58
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13102.00 =     948.47 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  13102.00 TO NODE  13103.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    807.20  DOWNSTREAM(FEET) =    769.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   691.01   CHANNEL SLOPE =  0.0539
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.849
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       20.65      0.60     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.01
  AVERAGE FLOW DEPTH(FEET) =   0.79   TRAVEL TIME(MIN.) =   3.83
  Tc(MIN.) =   14.87
  SUBAREA AREA(ACRES) =    20.65       SUBAREA RUNOFF(CFS) =    4.64
  EFFECTIVE AREA(ACRES) =     29.26     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3         PEAK FLOW RATE(CFS) =       6.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) =   3.13
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13103.00 =    1639.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   769.94  DOWNSTREAM(FEET) =   693.88
  FLOW LENGTH(FEET) =  1563.10   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   5.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.10
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.57
  PIPE TRAVEL TIME(MIN.) =   2.58    Tc(MIN.) =   17.45
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13104.00 =    3202.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.45
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.780
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.00      0.60     0.750     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.750
  SUBAREA AREA(ACRES) =   28.00      SUBAREA RUNOFF(CFS) =    8.33
  EFFECTIVE AREA(ACRES) =     57.26   AREA-AVERAGED Fm(INCH/HR) =  0.53
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =       57.3       PEAK FLOW RATE(CFS) =      13.09
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   693.88  DOWNSTREAM(FEET) =   645.69
  FLOW LENGTH(FEET) =  1068.98   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.06
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.09
  PIPE TRAVEL TIME(MIN.) =   1.48    Tc(MIN.) =   18.92
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13105.00 =    4271.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.92
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.743
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.28      0.60     0.867     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
  SUBAREA AREA(ACRES) =   35.28      SUBAREA RUNOFF(CFS) =    7.06
  EFFECTIVE AREA(ACRES) =     92.54   AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =       92.5       PEAK FLOW RATE(CFS) =      18.21

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.69  DOWNSTREAM(FEET) =   608.48
  FLOW LENGTH(FEET) =  1127.55   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.88
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.21
  PIPE TRAVEL TIME(MIN.) =   1.58    Tc(MIN.) =   20.50
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.50
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.706
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       37.68      0.60      0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  SUBAREA AREA(ACRES) =   37.68      SUBAREA RUNOFF(CFS) =    5.87
  EFFECTIVE AREA(ACRES) =    130.22   AREA-AVERAGED Fm(INCH/HR) =  0.53
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =      130.2       PEAK FLOW RATE(CFS) =      21.06

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S30.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      141.48   53.49  0.60( 0.48) 0.81    1996.0   13000.00
      2      137.35   56.68  0.60( 0.48) 0.81    2016.1   13010.00
    TOTAL AREA(ACRES) =     2016.1

****************************************************************************
  FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      141.48   53.49  0.60( 0.48) 0.81    1996.0   13000.00
      2      137.35   56.68  0.60( 0.48) 0.81    2016.1   13010.00
    TOTAL AREA(ACRES) =      2016.1

****************************************************************************
  FLOW PROCESS FROM NODE  13026.00 TO NODE  13106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    662.66  DOWNSTREAM(FEET) =    608.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3098.88   CHANNEL SLOPE =  0.0175
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.370
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       75.28      0.60      0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     144.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.44
  AVERAGE FLOW DEPTH(FEET) =   2.55   TRAVEL TIME(MIN.) =   6.94
  Tc(MIN.) =   60.44
  SUBAREA AREA(ACRES) =    75.28       SUBAREA RUNOFF(CFS) =    6.14
  EFFECTIVE AREA(ACRES) =   2071.24     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.80
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2091.4         PEAK FLOW RATE(CFS) =     141.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.53   FLOW VELOCITY(FEET/SEC.) =   7.38
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      141.48   60.44    0.370  0.60( 0.48) 0.80    2071.2   13000.00
      2      137.35   63.69    0.363  0.60( 0.48) 0.80    2091.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     141.48  Tc(MIN.) =   60.44
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    2071.24

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      141.48   60.44    0.370  0.60( 0.48) 0.80    2071.2   13000.00
      2      137.35   63.69    0.363  0.60( 0.48) 0.80    2091.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       21.06   20.50    0.706  0.60( 0.53) 0.88     130.2   13100.00
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      162.54   20.50    0.706  0.60( 0.49) 0.82     832.9   13100.00
      2      146.77   60.44    0.370  0.60( 0.48) 0.81    2201.5   13000.00
      3      142.54   63.69    0.363  0.60( 0.48) 0.81    2221.6   13010.00
    TOTAL AREA(ACRES) =      2221.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      162.54  Tc(MIN.) =   20.504
```

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  EFFECTIVE AREA(ACRES) =    832.90  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     2221.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13106.00 TO NODE  13107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    608.48  DOWNSTREAM(FEET) =    584.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1650.20   CHANNEL SLOPE =  0.0147
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.642
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      190.45      0.60     0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     178.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.33
  AVERAGE FLOW DEPTH(FEET) =   2.85   TRAVEL TIME(MIN.) =   3.75
  Tc(MIN.) =   24.25
  SUBAREA AREA(ACRES) =   190.45       SUBAREA RUNOFF(CFS) =   32.38
  EFFECTIVE AREA(ACRES) =   1023.35     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     2412.1         PEAK FLOW RATE(CFS) =     162.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.75   FLOW VELOCITY(FEET/SEC.) =   7.16
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13107.00 =   20924.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      162.54   24.25    0.642  0.60( 0.48) 0.80    1023.4   13100.00
      2      152.50   64.33    0.361  0.60( 0.48) 0.80    2391.9   13000.00
      3      150.82   67.60    0.354  0.60( 0.48) 0.80    2412.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     162.54  Tc(MIN.) =   24.25
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    1023.35

****************************************************************************
  FLOW PROCESS FROM NODE  13107.00 TO NODE  13108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.29  DOWNSTREAM(FEET) =    563.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1061.67   CHANNEL SLOPE =  0.0193
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.609
```



```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      314.12      0.60     0.939     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.939
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     169.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.02
  AVERAGE FLOW DEPTH(FEET) =   2.65   TRAVEL TIME(MIN.) =   2.21
  Tc(MIN.) =   26.46
  SUBAREA AREA(ACRES) =   314.12       SUBAREA RUNOFF(CFS) =   12.89
  EFFECTIVE AREA(ACRES) =   1337.47     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     2726.2         PEAK FLOW RATE(CFS) =     162.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.61   FLOW VELOCITY(FEET/SEC.) =   7.94
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13108.00 =   21986.51 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      162.54   26.46    0.609  0.60( 0.50) 0.84    1337.5   13100.00
      2      156.45   66.58    0.356  0.60( 0.49) 0.82    2706.0   13000.00
      3      154.61   69.86    0.348  0.60( 0.49) 0.82    2726.2   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     162.54  Tc(MIN.) =   26.46
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =    1337.47

****************************************************************************
  FLOW PROCESS FROM NODE  13108.00 TO NODE  13109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    563.78  DOWNSTREAM(FEET) =    541.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1657.28   CHANNEL SLOPE =  0.0134
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.557
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      203.63      0.60     0.785     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.785
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     173.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.04
  AVERAGE FLOW DEPTH(FEET) =   2.87   TRAVEL TIME(MIN.) =   3.92
  Tc(MIN.) =   30.38
  SUBAREA AREA(ACRES) =   203.63       SUBAREA RUNOFF(CFS) =   21.95
  EFFECTIVE AREA(ACRES) =   1541.10     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.83
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
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  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2929.8         PEAK FLOW RATE(CFS) =     162.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.80   FLOW VELOCITY(FEET/SEC.) =   6.92
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13109.00 =   23643.79 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      162.54   30.38    0.557  0.60( 0.50) 0.83    1541.1   13100.00
      2      166.08   70.57    0.347  0.60( 0.49) 0.82    2909.7   13000.00
      3      163.89   73.86    0.339  0.60( 0.49) 0.82    2929.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     166.08  Tc(MIN.) =   70.57
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2909.66

****************************************************************************
  FLOW PROCESS FROM NODE  13109.00 TO NODE  13110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    541.61  DOWNSTREAM(FEET) =    509.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2016.96   CHANNEL SLOPE =  0.0157
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.336
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      283.06      0.60     0.791     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.791
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     175.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.50
  AVERAGE FLOW DEPTH(FEET) =   2.79   TRAVEL TIME(MIN.) =   4.48
  Tc(MIN.) =   75.05
  SUBAREA AREA(ACRES) =   283.06       SUBAREA RUNOFF(CFS) =   17.91
  EFFECTIVE AREA(ACRES) =   3192.72     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.81
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3212.9         PEAK FLOW RATE(CFS) =     179.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.82   FLOW VELOCITY(FEET/SEC.) =   7.52
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13110.00 =   25660.75 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      162.54   34.87    0.521  0.60( 0.49) 0.82    1824.2   13100.00
      2      179.05   75.05    0.336  0.60( 0.49) 0.81    3192.7   13000.00
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      3      176.37   78.38    0.329  0.60( 0.49) 0.81    3212.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     179.05  Tc(MIN.) =   75.05
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3192.72

****************************************************************************
  FLOW PROCESS FROM NODE  13110.00 TO NODE  13111.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    509.94  DOWNSTREAM(FEET) =    461.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3058.95   CHANNEL SLOPE =  0.0160
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.321
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      248.05      0.60     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     186.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.66
  AVERAGE FLOW DEPTH(FEET) =   2.85   TRAVEL TIME(MIN.) =   6.65
  Tc(MIN.) =   81.70
  SUBAREA AREA(ACRES) =   248.05       SUBAREA RUNOFF(CFS) =   15.55
  EFFECTIVE AREA(ACRES) =   3440.77     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.81
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3460.9         PEAK FLOW RATE(CFS) =     186.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.85   FLOW VELOCITY(FEET/SEC.) =   7.65
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13111.00 =   28719.70 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      162.54   41.64    0.471  0.60( 0.49) 0.82    2072.2   13100.00
      2      186.46   81.70    0.321  0.60( 0.49) 0.81    3440.8   13000.00
      3      183.31   85.06    0.313  0.60( 0.49) 0.81    3460.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     186.46  Tc(MIN.) =   81.70
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3440.77

****************************************************************************
  FLOW PROCESS FROM NODE  13111.00 TO NODE  13112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    461.07  DOWNSTREAM(FEET) =    452.77
```

```
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1781.78   CHANNEL SLOPE =  0.0047
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.307
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      179.91      0.60     0.694     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.694
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     194.06
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.87
 AVERAGE FLOW DEPTH(FEET) =   3.64   TRAVEL TIME(MIN.) =   6.10
 Tc(MIN.) =   87.80
 SUBAREA AREA(ACRES) =   179.91       SUBAREA RUNOFF(CFS) =   15.21
 EFFECTIVE AREA(ACRES) =   3620.68     AREA-AVERAGED Fm(INCH/HR) =   0.48
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.81
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     3640.9         PEAK FLOW RATE(CFS) =     193.53

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.64   FLOW VELOCITY(FEET/SEC.) =   4.86
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13112.00 =   30501.48 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      168.92   47.91    0.435  0.60( 0.48) 0.81    2252.1   13100.00
     2      193.53   87.80    0.307  0.60( 0.48) 0.81    3620.7   13000.00
     3      190.47   91.18    0.300  0.60( 0.48) 0.81    3640.9   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     193.53  Tc(MIN.) =   87.80
 AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3620.68

****************************************************************************
 FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    452.77  DOWNSTREAM(FEET) =    427.51
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1625.01   CHANNEL SLOPE =  0.0155
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.300
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      155.96      0.60     0.836     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.836
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     196.98
```



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 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.68
 AVERAGE FLOW DEPTH(FEET) =   2.92   TRAVEL TIME(MIN.) =   3.53
 Tc(MIN.) =   91.33
 SUBAREA AREA(ACRES) =   155.96       SUBAREA RUNOFF(CFS) =    6.91
 EFFECTIVE AREA(ACRES) =   3776.64     AREA-AVERAGED Fm(INCH/HR) =   0.48
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.81
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     3796.8         PEAK FLOW RATE(CFS) =     195.96

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.92   FLOW VELOCITY(FEET/SEC.) =   7.68
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      170.71   51.55    0.415  0.60( 0.49) 0.81    2408.1   13100.00
     2      195.96   91.33    0.300  0.60( 0.48) 0.81    3776.6   13000.00
     3      193.82   94.72    0.295  0.60( 0.48) 0.81    3796.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     195.96  Tc(MIN.) =   91.33
 AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3776.64
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     3796.8  TC(MIN.) =     91.33
 EFFECTIVE AREA(ACRES) =   3776.64  AREA-AVERAGED Fm(INCH/HR)=  0.48
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.808
 PEAK FLOW RATE(CFS)   =     195.96

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      170.71   51.55    0.415  0.60( 0.49) 0.81    2408.1   13100.00
     2      195.96   91.33    0.300  0.60( 0.48) 0.81    3776.6   13000.00
     3      193.82   94.72    0.295  0.60( 0.48) 0.81    3796.8   13010.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S32.DAT
  TIME/DATE OF STUDY: 14:37 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.596
   2)   10.00;  1.064
   3)   15.00;  0.843
   4)   20.00;  0.715
   5)   25.00;  0.629
   6)   30.00;  0.560
   7)   40.00;  0.480
   8)   50.00;  0.423
   9)   60.00;  0.371
  10)   90.00;  0.302
  11)  120.00;  0.256
  12)  180.00;  0.208
  13)  360.00;  0.142
  14) 1440.00;  0.060
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13200.00 TO NODE  13201.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.57
  ELEVATION DATA: UPSTREAM(FEET) =   1069.04  DOWNSTREAM(FEET) =   1005.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.410
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.127
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.67      0.60     1.000     0    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      0.32

**************************************************************************
  FLOW PROCESS FROM NODE  13201.00 TO NODE  13202.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.76  DOWNSTREAM(FEET) =    896.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   747.55   CHANNEL SLOPE =  0.1455
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.910
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.41      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.05
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   4.08
  Tc(MIN.) =   13.49
  SUBAREA AREA(ACRES) =     7.41       SUBAREA RUNOFF(CFS) =    2.07
  EFFECTIVE AREA(ACRES) =      8.08     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.1         PEAK FLOW RATE(CFS) =       2.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.47   FLOW VELOCITY(FEET/SEC.) =   3.43
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13202.00 =    1046.12 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   896.98  DOWNSTREAM(FEET) =   840.27
 FLOW LENGTH(FEET) =  1789.59   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
 DEPTH OF FLOW IN  36.0 INCH PIPE IS   3.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.31
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.25
 PIPE TRAVEL TIME(MIN.) =   4.73    Tc(MIN.) =   18.22
 LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13203.00 =    2835.71 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   18.22
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.761
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       38.89      0.60     0.731     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.731
 SUBAREA AREA(ACRES) =   38.89      SUBAREA RUNOFF(CFS) =   11.28
 EFFECTIVE AREA(ACRES) =     46.97   AREA-AVERAGED Fm(INCH/HR) =  0.47
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.78
 TOTAL AREA(ACRES) =       47.0       PEAK FLOW RATE(CFS) =      12.44

****************************************************************************
 FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   840.27  DOWNSTREAM(FEET) =   782.97
 FLOW LENGTH(FEET) =   992.54   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
 DEPTH OF FLOW IN  36.0 INCH PIPE IS   7.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.97
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.44
 PIPE TRAVEL TIME(MIN.) =   1.28    Tc(MIN.) =   19.49
 LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13204.00 =    3828.25 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   19.49
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.728
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       83.09      0.60     0.645     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.645
 SUBAREA AREA(ACRES) =   83.09      SUBAREA RUNOFF(CFS) =   25.51
```



```
 EFFECTIVE AREA(ACRES) =    130.06   AREA-AVERAGED Fm(INCH/HR) =  0.42
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.69
 TOTAL AREA(ACRES) =      130.1       PEAK FLOW RATE(CFS) =      36.57

****************************************************************************
 FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   782.97  DOWNSTREAM(FEET) =   692.52
 FLOW LENGTH(FEET) =  2046.57   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  12.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.06
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      36.57
 PIPE TRAVEL TIME(MIN.) =   2.12    Tc(MIN.) =   21.62
 LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13205.00 =    5874.82 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   21.62
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.687
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       88.51      0.60     0.679     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.679
 SUBAREA AREA(ACRES) =   88.51      SUBAREA RUNOFF(CFS) =   22.30
 EFFECTIVE AREA(ACRES) =    218.57   AREA-AVERAGED Fm(INCH/HR) =  0.41
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.69
 TOTAL AREA(ACRES) =      218.6       PEAK FLOW RATE(CFS) =      54.09

****************************************************************************
 FLOW PROCESS FROM NODE  13205.00 TO NODE  13206.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    692.52  DOWNSTREAM(FEET) =    605.24
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2704.69   CHANNEL SLOPE =  0.0323
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.573
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      163.73      0.60     0.858     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.14
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.05
  AVERAGE FLOW DEPTH(FEET) =   1.82   TRAVEL TIME(MIN.) =   7.45
  Tc(MIN.) =   29.07
  SUBAREA AREA(ACRES) =   163.73       SUBAREA RUNOFF(CFS) =   11.99
  EFFECTIVE AREA(ACRES) =    382.30     AREA-AVERAGED Fm(INCH/HR) =   0.46
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.76
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      382.3         PEAK FLOW RATE(CFS) =      54.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.75   FLOW VELOCITY(FEET/SEC.) =   5.89
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13206.00 =    8579.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13206.00 TO NODE  13207.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.24  DOWNSTREAM(FEET) =    555.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2479.15   CHANNEL SLOPE =  0.0201
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.502
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      143.41      0.60     0.888     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.888
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.02
  AVERAGE FLOW DEPTH(FEET) =   1.96   TRAVEL TIME(MIN.) =   8.23
  Tc(MIN.) =   37.30
  SUBAREA AREA(ACRES) =   143.41       SUBAREA RUNOFF(CFS) =    7.25
  EFFECTIVE AREA(ACRES) =    525.71     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.80
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      525.7         PEAK FLOW RATE(CFS) =      54.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.91   FLOW VELOCITY(FEET/SEC.) =   4.93
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13207.00 =   11058.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    555.41  DOWNSTREAM(FEET) =    505.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1734.55   CHANNEL SLOPE =  0.0287
```



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  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.467
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.56      0.60     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.73
  AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   5.05
  Tc(MIN.) =   42.35
  SUBAREA AREA(ACRES) =   123.56       SUBAREA RUNOFF(CFS) =    7.37
  EFFECTIVE AREA(ACRES) =    649.27     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.81
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      649.3         PEAK FLOW RATE(CFS) =      54.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.79   FLOW VELOCITY(FEET/SEC.) =   5.64
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   42.35
  RAINFALL INTENSITY(INCH/HR) =   0.47
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.81
  EFFECTIVE STREAM AREA(ACRES) =     649.27
  TOTAL STREAM AREA(ACRES) =     649.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      54.09

****************************************************************************
  FLOW PROCESS FROM NODE  13210.00 TO NODE  13211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   314.51
  ELEVATION DATA: UPSTREAM(FEET) =    949.80  DOWNSTREAM(FEET) =    828.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.525
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.221
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  NATURAL FAIR COVER
  "OPEN BRUSH"                -       1.96      0.60     1.000     0    8.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.10
  TOTAL AREA(ACRES) =      1.96   PEAK FLOW RATE(CFS) =      1.10

****************************************************************************
  FLOW PROCESS FROM NODE  13211.00 TO NODE  13212.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    828.64  DOWNSTREAM(FEET) =    767.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   652.49   CHANNEL SLOPE =  0.0930
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.979
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.95      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.20
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   3.40
  Tc(MIN.) =   11.92
  SUBAREA AREA(ACRES) =    11.95       SUBAREA RUNOFF(CFS) =    4.08
  EFFECTIVE AREA(ACRES) =     13.91     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.9         PEAK FLOW RATE(CFS) =       4.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   3.54
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13212.00 =     967.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13212.00 TO NODE  13213.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    767.94  DOWNSTREAM(FEET) =    706.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.91   CHANNEL SLOPE =  0.0635
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.801
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.07      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.41
  AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =   4.74
  Tc(MIN.) =   16.66
```



```
  SUBAREA AREA(ACRES) =    27.07       SUBAREA RUNOFF(CFS) =    4.89
  EFFECTIVE AREA(ACRES) =     40.98     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.0         PEAK FLOW RATE(CFS) =       7.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   3.42
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13213.00 =    1934.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13213.00 TO NODE  13214.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    706.43  DOWNSTREAM(FEET) =    659.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.11   CHANNEL SLOPE =  0.0497
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.688
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.09      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.20
  AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =   4.94
  Tc(MIN.) =   21.60
  SUBAREA AREA(ACRES) =    18.09       SUBAREA RUNOFF(CFS) =    1.43
  EFFECTIVE AREA(ACRES) =     59.07     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       59.1         PEAK FLOW RATE(CFS) =       7.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.89   FLOW VELOCITY(FEET/SEC.) =   3.12
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13214.00 =    2883.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13214.00 TO NODE  13215.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    659.31  DOWNSTREAM(FEET) =    628.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   970.24   CHANNEL SLOPE =  0.0313
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.591
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       71.42      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
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  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.61
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   6.19
  Tc(MIN.) =   27.79
  SUBAREA AREA(ACRES) =    71.42       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    130.49     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      130.5         PEAK FLOW RATE(CFS) =       7.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   2.61
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13215.00 =    3853.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13215.00 TO NODE  13216.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    628.91  DOWNSTREAM(FEET) =    598.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =   922.63   CHANNEL SLOPE =  0.0331
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.531
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.33      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.65
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   5.79
  Tc(MIN.) =   33.58
  SUBAREA AREA(ACRES) =    36.33       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    166.82     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      166.8         PEAK FLOW RATE(CFS) =       7.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   2.65
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13216.00 =    4775.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13216.00 TO NODE  13217.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    598.39  DOWNSTREAM(FEET) =    568.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   636.40   CHANNEL SLOPE =  0.0470
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.504
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       42.51      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.06
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   37.05
  SUBAREA AREA(ACRES) =    42.51       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    209.33     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      209.3         PEAK FLOW RATE(CFS) =       7.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   3.06
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13217.00 =    5412.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    568.48  DOWNSTREAM(FEET) =    505.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.50   CHANNEL SLOPE =  0.0331
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.431
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.24      0.60     0.951     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.73
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =  11.59
  Tc(MIN.) =   48.63
  SUBAREA AREA(ACRES) =    73.24       SUBAREA RUNOFF(CFS) =    1.39
  EFFECTIVE AREA(ACRES) =    282.57     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      282.6         PEAK FLOW RATE(CFS) =       7.40
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  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   2.69
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13220.00 =    7308.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   48.63
  RAINFALL INTENSITY(INCH/HR) =   0.43
  AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     282.57
  TOTAL STREAM AREA(ACRES) =     282.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.40

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.09   42.35    0.467  0.60( 0.48) 0.81     649.3   13200.00
      2        7.40   48.63    0.431  0.60( 0.59) 0.99     282.6   13210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       61.07   42.35    0.467  0.60( 0.51) 0.86     895.3   13200.00
      2       57.34   48.63    0.431  0.60( 0.52) 0.86     931.8   13210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      61.07    Tc(MIN.) =    42.35
  EFFECTIVE AREA(ACRES) =     895.33   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      931.8
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13220.00 TO NODE  13221.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    505.65  DOWNSTREAM(FEET) =    478.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1949.14   CHANNEL SLOPE =  0.0137
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.434
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
        LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                 -      108.50      0.60      0.637     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.637
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      68.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   2.02   TRAVEL TIME(MIN.) =   5.77
  Tc(MIN.) =   48.12
  SUBAREA AREA(ACRES) =   108.50       SUBAREA RUNOFF(CFS) =   15.37
  EFFECTIVE AREA(ACRES) =   1003.83     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.83
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1040.3         PEAK FLOW RATE(CFS) =      65.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.98   FLOW VELOCITY(FEET/SEC.) =   5.56
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13221.00 =   14742.35 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       65.48   48.12    0.434  0.60( 0.50) 0.83    1003.8   13200.00
      2       60.48   54.51    0.400  0.60( 0.50) 0.84    1040.3   13210.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      65.48  Tc(MIN.) =   48.12
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =    1003.83

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    478.94  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2078.70   CHANNEL SLOPE =  0.0247
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.407
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                 -       87.26      0.60      0.699     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.699
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.07
  AVERAGE FLOW DEPTH(FEET) =   1.82   TRAVEL TIME(MIN.) =   4.90
  Tc(MIN.) =   53.02
  SUBAREA AREA(ACRES) =    87.26       SUBAREA RUNOFF(CFS) =    9.63
  EFFECTIVE AREA(ACRES) =   1091.09     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.82
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
```

```
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1127.6         PEAK FLOW RATE(CFS) =      71.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =   7.09
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       71.12   53.02    0.407  0.60( 0.49) 0.82    1091.1   13200.00
      2       65.38   59.51    0.374  0.60( 0.50) 0.83    1127.6   13210.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      71.12  Tc(MIN.) =   53.02
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    1091.09
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1127.6  TC(MIN.) =     53.02
  EFFECTIVE AREA(ACRES) =   1091.09  AREA-AVERAGED Fm(INCH/HR)=  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.822
  PEAK FLOW RATE(CFS)   =      71.12

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       71.12   53.02    0.407  0.60( 0.49) 0.82    1091.1   13200.00
      2       65.38   59.51    0.374  0.60( 0.50) 0.83    1127.6   13210.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S33.DAT
  TIME/DATE OF STUDY: 07:57 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.824
   2)   10.00;  1.217
   3)   15.00;  0.932
   4)   20.00;  0.766
   5)   25.00;  0.662
   6)   30.00;  0.587
   7)   40.00;  0.506
   8)   50.00;  0.449
   9)   60.00;  0.406
  10)   90.00;  0.342
  11)  120.00;  0.298
  12)  180.00;  0.248
  13)  360.00;  0.182
  14) 1440.00;  0.080
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S31.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      170.71   51.55  0.60( 0.49) 0.81    2408.1   13100.00
      2      195.96   91.33  0.60( 0.48) 0.81    3776.6   13000.00
      3      193.82   94.72  0.60( 0.48) 0.81    3796.8   13010.00
    TOTAL AREA(ACRES) =     3796.8

**************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S32.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       71.12   53.02  0.60( 0.49) 0.82    1091.1   13200.00
      2       65.38   59.51  0.60( 0.50) 0.83    1127.6   13210.00
    TOTAL AREA(ACRES) =     1127.6

**************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       71.12   53.02  0.60( 0.49) 0.82    1091.1   13200.00
      2       65.38   59.51  0.60( 0.50) 0.83    1127.6   13210.00
    TOTAL AREA(ACRES) =      1127.6

**************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  11
--------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       71.12   53.02    0.436  0.60( 0.49) 0.82    1091.1   13200.00
      2       65.38   59.51    0.408  0.60( 0.50) 0.83    1127.6   13210.00
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      170.71   51.55    0.442  0.60( 0.49) 0.81    2408.1   13100.00
      2      195.96   91.33    0.340  0.60( 0.48) 0.81    3776.6   13000.00
```

```
      3      193.82   94.72    0.335  0.60( 0.48) 0.81    3796.8   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      240.85   51.55    0.442  0.60( 0.49) 0.81    3468.9   13100.00
      2      242.76   53.02    0.436  0.60( 0.49) 0.81    3549.8   13200.00
      3      241.14   59.51    0.408  0.60( 0.49) 0.81    3809.7   13210.00
      4      250.41   91.33    0.340  0.60( 0.49) 0.81    4904.2   13000.00
      5      247.47   94.72    0.335  0.60( 0.49) 0.81    4924.4   13010.00
    TOTAL AREA(ACRES) =      4924.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      250.41  Tc(MIN.) =   91.327
  EFFECTIVE AREA(ACRES) =   4904.24  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4924.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13223.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    416.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   864.00   CHANNEL SLOPE =  0.0129
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     250.41
  FLOW VELOCITY(FEET/SEC.) =   6.11   FLOW DEPTH(FEET) =   3.70
  TRAVEL TIME(MIN.) =   2.36   Tc(MIN.) =   93.68
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      251.15   53.92    0.432  0.60( 0.49) 0.81    3468.9   13100.00
      2      253.35   55.39    0.426  0.60( 0.49) 0.81    3549.8   13200.00
      3      255.22   61.89    0.402  0.60( 0.49) 0.81    3809.7   13210.00
      4      278.88   93.68    0.337  0.60( 0.49) 0.81    4904.2   13000.00
      5      276.13   97.07    0.332  0.60( 0.49) 0.81    4924.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     278.88  Tc(MIN.) =   93.68
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    4904.24

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
```



```
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610301T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       10.17   14.05  0.60( 0.60) 1.00      29.3   30100.00
      2        6.91   17.21  0.60( 0.60) 1.00      29.7   30110.00
    TOTAL AREA(ACRES) =       29.7

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      251.15   53.92    0.432  0.60( 0.49) 0.81    3468.9   13100.00
      2      253.35   55.39    0.426  0.60( 0.49) 0.81    3549.8   13200.00
      3      255.22   61.89    0.402  0.60( 0.49) 0.81    3809.7   13210.00
      4      278.88   93.68    0.337  0.60( 0.49) 0.81    4904.2   13000.00
      5      276.13   97.07    0.332  0.60( 0.49) 0.81    4924.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.17   14.05    0.986  0.60( 0.60) 1.00      29.3   30100.00
      2        6.91   17.21    0.859  0.60( 0.60) 1.00      29.7   30110.00
  LONGEST FLOWPATH FROM NODE  30110.00 TO NODE  13223.00 =    2058.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      261.31   14.05    0.986  0.60( 0.49) 0.82     933.2   30100.00
      2      258.05   17.21    0.859  0.60( 0.49) 0.82    1137.2   30110.00
      3      251.15   53.92    0.432  0.60( 0.49) 0.82    3498.6   13100.00
      4      253.35   55.39    0.426  0.60( 0.49) 0.82    3579.4   13200.00
      5      255.22   61.89    0.402  0.60( 0.49) 0.82    3839.4   13210.00
      6      278.88   93.68    0.337  0.60( 0.49) 0.81    4933.9   13000.00
      7      276.13   97.07    0.332  0.60( 0.49) 0.81    4954.1   13010.00
    TOTAL AREA(ACRES) =      4954.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      278.88  Tc(MIN.) =   93.683
  EFFECTIVE AREA(ACRES) =   4933.91  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4954.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13224.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    416.40  DOWNSTREAM(FEET) =    410.60
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   408.51   CHANNEL SLOPE =  0.0142
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     278.88
  FLOW VELOCITY(FEET/SEC.) =   6.53   FLOW DEPTH(FEET) =   3.77
  TRAVEL TIME(MIN.) =   1.04   Tc(MIN.) =   94.73
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      366.60   15.11    0.928  0.60( 0.49) 0.82     933.2   30100.00
      2      340.00   18.28    0.823  0.60( 0.49) 0.82    1137.2   30110.00
      3      251.15   54.99    0.428  0.60( 0.49) 0.82    3498.6   13100.00
      4      253.35   56.46    0.421  0.60( 0.49) 0.82    3579.4   13200.00
      5      255.22   62.95    0.400  0.60( 0.49) 0.82    3839.4   13210.00
      6      278.88   94.73    0.335  0.60( 0.49) 0.81    4933.9   13000.00
      7      276.13   98.12    0.330  0.60( 0.49) 0.81    4954.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     366.60  Tc(MIN.) =   15.11
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =     933.21

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610302T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        5.63   11.60  0.60( 0.60) 1.00      11.9   30210.00
      2        5.47   11.96  0.60( 0.60) 1.00      12.0   30200.00
    TOTAL AREA(ACRES) =       12.0

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      366.60   15.11    0.928  0.60( 0.49) 0.82     933.2   30100.00
      2      340.00   18.28    0.823  0.60( 0.49) 0.82    1137.2   30110.00
      3      251.15   54.99    0.428  0.60( 0.49) 0.82    3498.6   13100.00
      4      253.35   56.46    0.421  0.60( 0.49) 0.82    3579.4   13200.00
      5      255.22   62.95    0.400  0.60( 0.49) 0.82    3839.4   13210.00
      6      278.88   94.73    0.335  0.60( 0.49) 0.81    4933.9   13000.00
      7      276.13   98.12    0.330  0.60( 0.49) 0.81    4954.1   13010.00
```



```
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        5.63   11.60    1.126  0.60( 0.60) 1.00      11.9   30210.00
      2        5.47   11.96    1.105  0.60( 0.60) 1.00      12.0   30200.00
  LONGEST FLOWPATH FROM NODE  30200.00 TO NODE  13224.00 =    1209.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      372.23   11.60    1.126  0.60( 0.49) 0.82     728.2   30210.00
      2      372.07   11.96    1.105  0.60( 0.49) 0.82     750.5   30200.00
      3      370.15   15.11    0.928  0.60( 0.49) 0.82     945.2   30100.00
      4      342.42   18.28    0.823  0.60( 0.49) 0.82    1149.3   30110.00
      5      251.15   54.99    0.428  0.60( 0.49) 0.82    3510.6   13100.00
      6      253.35   56.46    0.421  0.60( 0.49) 0.82    3591.5   13200.00
      7      255.22   62.95    0.400  0.60( 0.49) 0.82    3851.4   13210.00
      8      278.88   94.73    0.335  0.60( 0.49) 0.81    4945.9   13000.00
      9      276.13   98.12    0.330  0.60( 0.49) 0.81    4966.1   13010.00
    TOTAL AREA(ACRES) =      4966.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      372.23  Tc(MIN.) =   11.598
  EFFECTIVE AREA(ACRES) =    728.24  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4966.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13301.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    410.60  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.70   CHANNEL SLOPE =  0.0227
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.983
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.66      0.60      0.998     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     382.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.42
  AVERAGE FLOW DEPTH(FEET) =   3.89   TRAVEL TIME(MIN.) =   2.50
  Tc(MIN.) =   14.09
  SUBAREA AREA(ACRES) =    61.66       SUBAREA RUNOFF(CFS) =   21.35
  EFFECTIVE AREA(ACRES) =    789.90     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     5027.8         PEAK FLOW RATE(CFS) =     372.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
 DEPTH(FEET) =  3.85   FLOW VELOCITY(FEET/SEC.) =   8.37
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.70 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      372.23   14.09    0.983  0.60( 0.50) 0.84     789.9   30210.00
     2      372.07   14.45    0.963  0.60( 0.50) 0.84     812.2   30200.00
     3      370.15   17.62    0.845  0.60( 0.50) 0.83    1006.9   30100.00
     4      342.42   20.84    0.749  0.60( 0.50) 0.83    1210.9   30110.00
     5      251.15   57.76    0.416  0.60( 0.49) 0.82    3572.3   13100.00
     6      253.35   59.23    0.410  0.60( 0.49) 0.82    3653.1   13200.00
     7      255.22   65.72    0.394  0.60( 0.49) 0.82    3913.1   13210.00
     8      278.88   97.43    0.331  0.60( 0.49) 0.82    5007.6   13000.00
     9      276.13  100.83    0.326  0.60( 0.49) 0.82    5027.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     372.23  Tc(MIN.) =   14.09
 AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =     789.90

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610303T.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       20.28   28.99  0.60( 0.60) 1.00     166.2   30300.00
   TOTAL AREA(ACRES) =      166.2

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      372.23   14.09    0.983  0.60( 0.50) 0.84     789.9   30210.00
     2      372.07   14.45    0.963  0.60( 0.50) 0.84     812.2   30200.00
     3      370.15   17.62    0.845  0.60( 0.50) 0.83    1006.9   30100.00
     4      342.42   20.84    0.749  0.60( 0.50) 0.83    1210.9   30110.00
     5      251.15   57.76    0.416  0.60( 0.49) 0.82    3572.3   13100.00
     6      253.35   59.23    0.410  0.60( 0.49) 0.82    3653.1   13200.00
     7      255.22   65.72    0.394  0.60( 0.49) 0.82    3913.1   13210.00
     8      278.88   97.43    0.331  0.60( 0.49) 0.82    5007.6   13000.00
     9      276.13  100.83    0.326  0.60( 0.49) 0.82    5027.8   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.70 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       20.28   28.99    0.602  0.60( 0.60) 1.00     166.2   30300.00
 LONGEST FLOWPATH FROM NODE  30300.00 TO NODE  13301.00 =    6391.00 FEET.
```



```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      388.33   14.09    0.983  0.60( 0.51) 0.85     870.7   30210.00
     2      388.23   14.45    0.963  0.60( 0.51) 0.85     895.1   30200.00
     3      387.44   17.62    0.845  0.60( 0.51) 0.85    1107.9   30100.00
     4      360.54   20.84    0.749  0.60( 0.51) 0.84    1330.4   30110.00
     5      342.55   28.99    0.602  0.60( 0.51) 0.84    1898.4   30300.00
     6      265.15   57.76    0.416  0.60( 0.50) 0.83    3738.5   13100.00
     7      267.14   59.23    0.410  0.60( 0.50) 0.83    3819.3   13200.00
     8      268.48   65.72    0.394  0.60( 0.50) 0.83    4079.3   13210.00
     9      290.03   97.43    0.331  0.60( 0.49) 0.82    5173.8   13000.00
    10      287.11  100.83    0.326  0.60( 0.49) 0.82    5194.0   13010.00
   TOTAL AREA(ACRES) =      5194.0

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      388.33  Tc(MIN.) =   14.094
 EFFECTIVE AREA(ACRES) =    870.72  AREA-AVERAGED Fm(INCH/HR) =  0.51
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.85
 TOTAL AREA(ACRES) =     5194.0
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.70 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13302.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    382.00  DOWNSTREAM(FEET) =    375.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1141.09   CHANNEL SLOPE =  0.0061
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.840
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        9.42      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     389.35
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.18
 AVERAGE FLOW DEPTH(FEET) =   5.01   TRAVEL TIME(MIN.) =   3.67
 Tc(MIN.) =   17.77
 SUBAREA AREA(ACRES) =     9.42       SUBAREA RUNOFF(CFS) =    2.04
 EFFECTIVE AREA(ACRES) =    880.14     AREA-AVERAGED Fm(INCH/HR) =   0.51
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.85
 TOTAL AREA(ACRES) =     5203.4         PEAK FLOW RATE(CFS) =     388.33
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.00   FLOW VELOCITY(FEET/SEC.) =   5.18
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.79 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      388.33   17.77    0.840  0.60( 0.51) 0.85     880.1   30210.00
     2      388.23   18.13    0.828  0.60( 0.51) 0.85     904.5   30200.00
```

```
      3      387.44   21.29    0.739  0.60( 0.51) 0.85    1117.3   30100.00
      4      360.54   24.58    0.671  0.60( 0.51) 0.85    1339.8   30110.00
      5      342.55   32.78    0.565  0.60( 0.51) 0.84    1907.8   30300.00
      6      265.15   61.81    0.402  0.60( 0.50) 0.83    3747.9   13100.00
      7      267.14   63.26    0.399  0.60( 0.50) 0.83    3828.8   13200.00
      8      268.48   69.74    0.385  0.60( 0.50) 0.83    4088.7   13210.00
      9      290.03  101.38    0.325  0.60( 0.49) 0.82    5183.2   13000.00
     10      287.11  104.79    0.320  0.60( 0.49) 0.82    5203.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     388.33  Tc(MIN.) =   17.77
  AREA-AVERAGED Fm(INCH/HR) =  0.51  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.85  EFFECTIVE AREA(ACRES) =     880.14

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13302.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610214T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        8.24   37.30  0.60( 0.60) 1.00     227.7   21400.00
    TOTAL AREA(ACRES) =      227.7

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      388.33   17.77    0.840  0.60( 0.51) 0.85     880.1   30210.00
      2      388.23   18.13    0.828  0.60( 0.51) 0.85     904.5   30200.00
      3      387.44   21.29    0.739  0.60( 0.51) 0.85    1117.3   30100.00
      4      360.54   24.58    0.671  0.60( 0.51) 0.85    1339.8   30110.00
      5      342.55   32.78    0.565  0.60( 0.51) 0.84    1907.8   30300.00
      6      265.15   61.81    0.402  0.60( 0.50) 0.83    3747.9   13100.00
      7      267.14   63.26    0.399  0.60( 0.50) 0.83    3828.8   13200.00
      8      268.48   69.74    0.385  0.60( 0.50) 0.83    4088.7   13210.00
      9      290.03  101.38    0.325  0.60( 0.49) 0.82    5183.2   13000.00
     10      287.11  104.79    0.320  0.60( 0.49) 0.82    5203.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.79 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        8.24   37.30    0.528  0.60( 0.60) 1.00     227.7   21400.00
  LONGEST FLOWPATH FROM NODE  21400.00 TO NODE  13302.00 =    6708.00 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      394.57   17.77    0.840  0.60( 0.52) 0.87     988.6   30210.00
      2      394.51   18.13    0.828  0.60( 0.52) 0.87    1015.1   30200.00
      3      394.03   21.29    0.739  0.60( 0.52) 0.86    1247.3   30100.00
      4      367.44   24.58    0.671  0.60( 0.52) 0.86    1489.8   30110.00
      5      350.29   32.78    0.565  0.60( 0.51) 0.86    2107.9   30300.00
      6      338.73   37.30    0.528  0.60( 0.51) 0.86    2422.2   21400.00
      7      271.43   61.81    0.402  0.60( 0.50) 0.84    3975.6   13100.00
      8      273.37   63.26    0.399  0.60( 0.50) 0.84    4056.4   13200.00
      9      274.50   69.74    0.385  0.60( 0.50) 0.84    4316.4   13210.00
     10      295.10  101.38    0.325  0.60( 0.50) 0.83    5410.9   13000.00
     11      292.11  104.79    0.320  0.60( 0.50) 0.83    5431.1   13010.00
    TOTAL AREA(ACRES) =      5431.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      394.57  Tc(MIN.) =   17.769
  EFFECTIVE AREA(ACRES) =    988.58  AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =     5431.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    375.00  DOWNSTREAM(FEET) =    355.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2193.96   CHANNEL SLOPE =  0.0091
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     394.57
  FLOW VELOCITY(FEET/SEC.) =   6.03   FLOW DEPTH(FEET) =   4.67
  TRAVEL TIME(MIN.) =   6.07   Tc(MIN.) =   23.84
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      394.57   23.84    0.686  0.60( 0.52) 0.87     988.6   30210.00
      2      394.51   24.20    0.679  0.60( 0.52) 0.87    1015.1   30200.00
      3      394.03   27.35    0.627  0.60( 0.52) 0.86    1247.3   30100.00
      4      367.44   30.76    0.581  0.60( 0.52) 0.86    1489.8   30110.00
      5      350.29   39.03    0.514  0.60( 0.51) 0.86    2107.9   30300.00
      6      338.73   43.61    0.485  0.60( 0.51) 0.86    2422.2   21400.00
      7      271.43   68.48    0.388  0.60( 0.50) 0.84    3975.6   13100.00
      8      273.37   69.91    0.385  0.60( 0.50) 0.84    4056.4   13200.00
      9      274.50   76.39    0.371  0.60( 0.50) 0.84    4316.4   13210.00
     10      295.10  107.91    0.316  0.60( 0.50) 0.83    5410.9   13000.00
     11      292.11  111.32    0.311  0.60( 0.50) 0.83    5431.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     394.57  Tc(MIN.) =   23.84
  AREA-AVERAGED Fm(INCH/HR) =  0.52  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =     988.58

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610213T.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       17.34   19.10  0.60( 0.60) 1.00      98.2   21300.00
   TOTAL AREA(ACRES) =       98.2

****************************************************************************
 FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      394.57   23.84    0.686  0.60( 0.52) 0.87     988.6   30210.00
     2      394.51   24.20    0.679  0.60( 0.52) 0.87    1015.1   30200.00
     3      394.03   27.35    0.627  0.60( 0.52) 0.86    1247.3   30100.00
     4      367.44   30.76    0.581  0.60( 0.52) 0.86    1489.8   30110.00
     5      350.29   39.03    0.514  0.60( 0.51) 0.86    2107.9   30300.00
     6      338.73   43.61    0.485  0.60( 0.51) 0.86    2422.2   21400.00
     7      271.43   68.48    0.388  0.60( 0.50) 0.84    3975.6   13100.00
     8      273.37   69.91    0.385  0.60( 0.50) 0.84    4056.4   13200.00
     9      274.50   76.39    0.371  0.60( 0.50) 0.84    4316.4   13210.00
    10      295.10  107.91    0.316  0.60( 0.50) 0.83    5410.9   13000.00
    11      292.11  111.32    0.311  0.60( 0.50) 0.83    5431.1   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       17.34   19.10    0.796  0.60( 0.60) 1.00      98.2   21300.00
 LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  13303.00 =    2988.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      411.91   19.10    0.796  0.60( 0.53) 0.88     890.4   21300.00
     2      402.21   23.84    0.686  0.60( 0.53) 0.88    1086.8   30210.00
     3      401.49   24.20    0.679  0.60( 0.53) 0.88    1113.3   30200.00
     4      396.41   27.35    0.627  0.60( 0.52) 0.87    1345.5   30100.00
     5      367.44   30.76    0.581  0.60( 0.52) 0.87    1588.0   30110.00
     6      350.29   39.03    0.514  0.60( 0.52) 0.86    2206.1   30300.00
     7      338.73   43.61    0.485  0.60( 0.52) 0.86    2520.4   21400.00
     8      271.43   68.48    0.388  0.60( 0.50) 0.84    4073.8   13100.00
     9      273.37   69.91    0.385  0.60( 0.50) 0.84    4154.6   13200.00
    10      274.50   76.39    0.371  0.60( 0.50) 0.84    4414.6   13210.00
```



```
    11      295.10  107.91    0.316  0.60( 0.50) 0.83    5509.1   13000.00
    12      292.11  111.32    0.311  0.60( 0.50) 0.83    5529.3   13010.00
  TOTAL AREA(ACRES) =      5529.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      411.91  Tc(MIN.) =   19.102
 EFFECTIVE AREA(ACRES) =    890.40  AREA-AVERAGED Fm(INCH/HR) =  0.53
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.83
 TOTAL AREA(ACRES) =     5529.3
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13303.00 TO NODE  13304.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    355.00  DOWNSTREAM(FEET) =    350.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   925.40   CHANNEL SLOPE =  0.0054
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.721
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       13.84      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     412.67
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.01
 AVERAGE FLOW DEPTH(FEET) =   5.24   TRAVEL TIME(MIN.) =   3.08
 Tc(MIN.) =   22.18
 SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =    1.51
 EFFECTIVE AREA(ACRES) =    904.24     AREA-AVERAGED Fm(INCH/HR) =   0.53
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.89
 TOTAL AREA(ACRES) =     5543.1         PEAK FLOW RATE(CFS) =     411.91
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.24   FLOW VELOCITY(FEET/SEC.) =   5.01
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      411.91   22.18    0.721  0.60( 0.53) 0.89     904.2   21300.00
     2      402.21   26.94    0.633  0.60( 0.53) 0.88    1100.6   30210.00
     3      401.49   27.29    0.628  0.60( 0.53) 0.88    1127.2   30200.00
     4      396.41   30.46    0.583  0.60( 0.53) 0.88    1359.3   30100.00
     5      367.44   33.93    0.555  0.60( 0.52) 0.87    1601.9   30110.00
     6      350.29   42.23    0.493  0.60( 0.52) 0.87    2219.9   30300.00
     7      338.73   46.84    0.467  0.60( 0.52) 0.86    2534.2   21400.00
     8      271.43   71.89    0.381  0.60( 0.51) 0.84    4087.6   13100.00
     9      273.37   73.32    0.378  0.60( 0.50) 0.84    4168.5   13200.00
    10      274.50   79.80    0.364  0.60( 0.50) 0.84    4428.4   13210.00
    11      295.10  111.26    0.311  0.60( 0.50) 0.83    5523.0   13000.00
    12      292.11  114.68    0.306  0.60( 0.50) 0.83    5543.1   13010.00
 NEW PEAK FLOW DATA ARE:
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```
  PEAK FLOW RATE(CFS) =     411.91  Tc(MIN.) =   22.18
  AREA-AVERAGED Fm(INCH/HR) =  0.53  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.89  EFFECTIVE AREA(ACRES) =     904.24

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610304T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       22.20   25.64  0.60( 0.60) 1.00     159.9   30410.00
      2       13.11   35.16  0.60( 0.60) 1.00     182.7   30400.00
    TOTAL AREA(ACRES) =      182.7

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      411.91   22.18    0.721  0.60( 0.53) 0.89     904.2   21300.00
      2      402.21   26.94    0.633  0.60( 0.53) 0.88    1100.6   30210.00
      3      401.49   27.29    0.628  0.60( 0.53) 0.88    1127.2   30200.00
      4      396.41   30.46    0.583  0.60( 0.53) 0.88    1359.3   30100.00
      5      367.44   33.93    0.555  0.60( 0.52) 0.87    1601.9   30110.00
      6      350.29   42.23    0.493  0.60( 0.52) 0.87    2219.9   30300.00
      7      338.73   46.84    0.467  0.60( 0.52) 0.86    2534.2   21400.00
      8      271.43   71.89    0.381  0.60( 0.51) 0.84    4087.6   13100.00
      9      273.37   73.32    0.378  0.60( 0.50) 0.84    4168.5   13200.00
     10      274.50   79.80    0.364  0.60( 0.50) 0.84    4428.4   13210.00
     11      295.10  111.26    0.311  0.60( 0.50) 0.83    5523.0   13000.00
     12      292.11  114.68    0.306  0.60( 0.50) 0.83    5543.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       22.20   25.64    0.653  0.60( 0.60) 1.00     159.9   30410.00
      2       13.11   35.16    0.545  0.60( 0.60) 1.00     182.7   30400.00
  LONGEST FLOWPATH FROM NODE  30400.00 TO NODE  13304.00 =    5899.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      434.11   22.18    0.721  0.60( 0.54) 0.90    1042.5   21300.00
      2      427.06   25.64    0.653  0.60( 0.54) 0.90    1206.8   30410.00
```



```
      3      423.17   26.94    0.633  0.60( 0.54) 0.90    1263.6   30210.00
      4      422.10   27.29    0.628  0.60( 0.54) 0.90    1291.0   30200.00
      5      414.00   30.46    0.583  0.60( 0.53) 0.89    1530.8   30100.00
      6      381.72   33.93    0.555  0.60( 0.53) 0.88    1781.6   30110.00
      7      378.00   35.16    0.545  0.60( 0.53) 0.88    1876.3   30400.00
      8      362.15   42.23    0.493  0.60( 0.53) 0.88    2402.6   30300.00
      9      349.95   46.84    0.467  0.60( 0.52) 0.87    2716.9   21400.00
     10      280.59   71.89    0.381  0.60( 0.51) 0.85    4270.3   13100.00
     11      282.46   73.32    0.378  0.60( 0.51) 0.85    4351.2   13200.00
     12      283.25   79.80    0.364  0.60( 0.51) 0.85    4611.2   13210.00
     13      302.57  111.26    0.311  0.60( 0.50) 0.84    5705.7   13000.00
     14      299.46  114.68    0.306  0.60( 0.50) 0.84    5725.8   13010.00
   TOTAL AREA(ACRES) =      5725.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      434.11  Tc(MIN.) =   22.179
  EFFECTIVE AREA(ACRES) =   1042.54  AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.90
  TOTAL AREA(ACRES) =     5725.8
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13305.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    350.00  DOWNSTREAM(FEET) =    315.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2966.27   CHANNEL SLOPE =  0.0118
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.595
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       27.39      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     434.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.80
  AVERAGE FLOW DEPTH(FEET) =   4.61   TRAVEL TIME(MIN.) =   7.27
  Tc(MIN.) =   29.45
  SUBAREA AREA(ACRES) =    27.39       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1069.93     AREA-AVERAGED Fm(INCH/HR) =   0.54
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.90
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     5753.2          PEAK FLOW RATE(CFS) =     434.11
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.61   FLOW VELOCITY(FEET/SEC.) =   6.80
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.42 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	434.11	29.45	0.595	0.60(0.54)	0.90	1069.9	21300.00
2	427.06	32.93	0.563	0.60(0.54)	0.90	1234.2	30410.00
3	423.17	34.25	0.553	0.60(0.54)	0.90	1291.0	30210.00
4	422.10	34.62	0.550	0.60(0.54)	0.90	1318.4	30200.00
5	414.00	37.81	0.524	0.60(0.54)	0.89	1558.2	30100.00
6	381.72	41.44	0.498	0.60(0.53)	0.89	1809.0	30110.00
7	378.00	42.70	0.490	0.60(0.53)	0.88	1903.7	30400.00
8	362.15	49.83	0.450	0.60(0.53)	0.88	2430.0	30300.00
9	349.95	54.51	0.430	0.60(0.52)	0.87	2744.3	21400.00
10	280.59	80.00	0.364	0.60(0.51)	0.85	4297.7	13100.00
11	282.46	81.42	0.361	0.60(0.51)	0.85	4378.6	13200.00
12	283.25	87.89	0.347	0.60(0.51)	0.85	4638.5	13210.00
13	302.57	119.23	0.299	0.60(0.50)	0.84	5733.1	13000.00
14	299.46	122.64	0.296	0.60(0.50)	0.84	5753.2	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 434.11 Tc(MIN.) = 29.45
AREA-AVERAGED Fm(INCH/HR) = 0.54 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.90 EFFECTIVE AREA(ACRES) = 1069.93

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610305T.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	45.73	33.03	0.60(0.60)	1.00	525.5	30520.00
2	41.97	36.79	0.60(0.60)	1.00	566.3	30540.00
3	40.10	38.12	0.60(0.60)	1.00	573.1	30510.00
4	32.81	41.91	0.60(0.60)	1.00	582.8	30500.00

TOTAL AREA(ACRES) = 582.8

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	434.11	29.45	0.595	0.60(0.54)	0.90	1069.9	21300.00
2	427.06	32.93	0.563	0.60(0.54)	0.90	1234.2	30410.00
3	423.17	34.25	0.553	0.60(0.54)	0.90	1291.0	30210.00
4	422.10	34.62	0.550	0.60(0.54)	0.90	1318.4	30200.00
5	414.00	37.81	0.524	0.60(0.54)	0.89	1558.2	30100.00
6	381.72	41.44	0.498	0.60(0.53)	0.89	1809.0	30110.00
7	378.00	42.70	0.490	0.60(0.53)	0.88	1903.7	30400.00
8	362.15	49.83	0.450	0.60(0.53)	0.88	2430.0	30300.00

9	349.95	54.51	0.430	0.60(0.52)	0.87	2744.3	21400.00
10	280.59	80.00	0.364	0.60(0.51)	0.85	4297.7	13100.00
11	282.46	81.42	0.361	0.60(0.51)	0.85	4378.6	13200.00
12	283.25	87.89	0.347	0.60(0.51)	0.85	4638.5	13210.00
13	302.57	119.23	0.299	0.60(0.50)	0.84	5733.1	13000.00
14	299.46	122.64	0.296	0.60(0.50)	0.84	5753.2	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	45.73	33.03	0.563	0.60(0.60)	1.00	525.5	30520.00
2	41.97	36.79	0.532	0.60(0.60)	1.00	566.3	30540.00
3	40.10	38.12	0.521	0.60(0.60)	1.00	573.1	30510.00
4	32.81	41.91	0.495	0.60(0.60)	1.00	582.8	30500.00

LONGEST FLOWPATH FROM NODE 30500.00 TO NODE 13305.00 = 9458.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	477.27	29.45	0.595	0.60(0.56)	0.93	1538.4	21300.00
2	472.72	32.93	0.563	0.60(0.56)	0.93	1758.1	30410.00
3	472.50	33.03	0.563	0.60(0.56)	0.93	1764.0	30520.00
4	467.68	34.25	0.553	0.60(0.56)	0.93	1829.7	30210.00
5	466.25	34.62	0.550	0.60(0.56)	0.93	1861.1	30200.00
6	458.56	36.79	0.532	0.60(0.55)	0.92	2047.9	30540.00
7	454.54	37.81	0.524	0.60(0.55)	0.92	2129.7	30100.00
8	451.34	38.12	0.521	0.60(0.55)	0.92	2152.8	30510.00
9	415.42	41.44	0.498	0.60(0.55)	0.91	2390.7	30110.00
10	413.15	41.91	0.495	0.60(0.55)	0.91	2427.0	30500.00
11	410.51	42.70	0.490	0.60(0.55)	0.91	2486.5	30400.00
12	391.96	49.83	0.450	0.60(0.54)	0.90	3012.9	30300.00
13	378.43	54.51	0.430	0.60(0.54)	0.89	3327.2	21400.00
14	304.68	80.00	0.364	0.60(0.52)	0.87	4880.6	13100.00
15	306.35	81.42	0.361	0.60(0.52)	0.87	4961.4	13200.00
16	306.23	87.89	0.347	0.60(0.52)	0.86	5221.4	13210.00
17	322.38	119.23	0.299	0.60(0.51)	0.85	6315.9	13000.00
18	319.05	122.64	0.296	0.60(0.51)	0.85	6336.1	13010.00

TOTAL AREA(ACRES) = 6336.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 477.27 Tc(MIN.) = 29.449
EFFECTIVE AREA(ACRES) = 1538.44 AREA-AVERAGED Fm(INCH/HR) = 0.56
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.93
TOTAL AREA(ACRES) = 6336.1
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.20 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 315.00 DOWNSTREAM(FEET) = 284.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1317.91 CHANNEL SLOPE = 0.0235
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 477.27

FLOW VELOCITY(FEET/SEC.) = 9.02 FLOW DEPTH(FEET) = 4.20
TRAVEL TIME(MIN.) = 2.43 Tc(MIN.) = 31.88
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	477.27	31.88	0.572	0.60(0.56)	0.93	1538.4	21300.00
2	472.72	35.37	0.544	0.60(0.56)	0.93	1758.1	30410.00
3	472.50	35.47	0.543	0.60(0.56)	0.93	1764.0	30520.00
4	467.68	36.69	0.533	0.60(0.56)	0.93	1829.7	30210.00
5	466.25	37.07	0.530	0.60(0.56)	0.93	1861.1	30200.00
6	458.56	39.25	0.512	0.60(0.55)	0.92	2047.9	30540.00
7	454.54	40.27	0.504	0.60(0.55)	0.92	2129.7	30100.00
8	451.34	40.59	0.502	0.60(0.55)	0.92	2152.8	30510.00
9	415.42	43.96	0.483	0.60(0.55)	0.91	2390.7	30110.00
10	413.15	44.43	0.481	0.60(0.55)	0.91	2427.0	30500.00
11	410.51	45.23	0.476	0.60(0.55)	0.91	2486.5	30400.00
12	391.96	52.39	0.439	0.60(0.54)	0.90	3012.9	30300.00
13	378.43	57.09	0.419	0.60(0.54)	0.89	3327.2	21400.00
14	304.68	82.73	0.358	0.60(0.52)	0.87	4880.6	13100.00
15	306.35	84.14	0.355	0.60(0.52)	0.87	4961.4	13200.00
16	306.23	90.62	0.341	0.60(0.52)	0.86	5221.4	13210.00
17	322.38	121.92	0.296	0.60(0.51)	0.85	6315.9	13000.00
18	319.05	125.34	0.293	0.60(0.51)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 477.27 Tc(MIN.) = 31.88
AREA-AVERAGED Fm(INCH/HR) = 0.56 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.93 EFFECTIVE AREA(ACRES) = 1538.44

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610306T.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.23	23.73	0.60(0.60)	1.00	40.4	30600.00

TOTAL AREA(ACRES) = 40.4

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	477.27	31.88	0.572	0.60(0.56)	0.93	1538.4	21300.00
2	472.72	35.37	0.544	0.60(0.56)	0.93	1758.1	30410.00
3	472.50	35.47	0.543	0.60(0.56)	0.93	1764.0	30520.00
4	467.68	36.69	0.533	0.60(0.56)	0.93	1829.7	30210.00
5	466.25	37.07	0.530	0.60(0.56)	0.93	1861.1	30200.00
6	458.56	39.25	0.512	0.60(0.55)	0.92	2047.9	30540.00
7	454.54	40.27	0.504	0.60(0.55)	0.92	2129.7	30100.00
8	451.34	40.59	0.502	0.60(0.55)	0.92	2152.8	30510.00
9	415.42	43.96	0.483	0.60(0.55)	0.91	2390.7	30110.00
10	413.15	44.43	0.481	0.60(0.55)	0.91	2427.0	30500.00
11	410.51	45.23	0.476	0.60(0.55)	0.91	2486.5	30400.00
12	391.96	52.39	0.439	0.60(0.54)	0.90	3012.9	30300.00
13	378.43	57.09	0.419	0.60(0.54)	0.89	3327.2	21400.00
14	304.68	82.73	0.358	0.60(0.52)	0.87	4880.6	13100.00
15	306.35	84.14	0.355	0.60(0.52)	0.87	4961.4	13200.00
16	306.23	90.62	0.341	0.60(0.52)	0.86	5221.4	13210.00
17	322.38	121.92	0.296	0.60(0.51)	0.85	6315.9	13000.00
18	319.05	125.34	0.293	0.60(0.51)	0.85	6336.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.23	23.73	0.689	0.60(0.60)	1.00	40.4	30600.00

LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 = 2948.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	480.50	23.73	0.689	0.60(0.56)	0.93	1185.4	30600.00
2	477.27	31.88	0.572	0.60(0.56)	0.93	1578.8	21300.00
3	472.72	35.37	0.544	0.60(0.56)	0.93	1798.4	30410.00
4	472.50	35.47	0.543	0.60(0.56)	0.93	1804.3	30520.00
5	467.68	36.69	0.533	0.60(0.56)	0.93	1870.0	30210.00
6	466.25	37.07	0.530	0.60(0.56)	0.93	1901.4	30200.00
7	458.56	39.25	0.512	0.60(0.55)	0.92	2088.2	30540.00
8	454.54	40.27	0.504	0.60(0.55)	0.92	2170.0	30100.00
9	451.34	40.59	0.502	0.60(0.55)	0.92	2193.1	30510.00
10	415.42	43.96	0.483	0.60(0.55)	0.92	2431.0	30110.00
11	413.15	44.43	0.481	0.60(0.55)	0.91	2467.3	30500.00
12	410.51	45.23	0.476	0.60(0.55)	0.91	2526.9	30400.00
13	391.96	52.39	0.439	0.60(0.54)	0.90	3053.2	30300.00
14	378.43	57.09	0.419	0.60(0.54)	0.90	3367.5	21400.00
15	304.68	82.73	0.358	0.60(0.52)	0.87	4920.9	13100.00
16	306.35	84.14	0.355	0.60(0.52)	0.87	5001.8	13200.00
17	306.23	90.62	0.341	0.60(0.52)	0.87	5261.7	13210.00
18	322.38	121.92	0.296	0.60(0.51)	0.86	6356.2	13000.00
19	319.05	125.34	0.293	0.60(0.51)	0.85	6376.4	13010.00

TOTAL AREA(ACRES) = 6376.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 480.50 Tc(MIN.) = 23.730
EFFECTIVE AREA(ACRES) = 1185.40 AREA-AVERAGED Fm(INCH/HR) = 0.56
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 6376.4
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.40 IS CODE = 51

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    284.00  DOWNSTREAM(FEET) =    274.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   826.37   CHANNEL SLOPE =  0.0121
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     480.50
  FLOW VELOCITY(FEET/SEC.) =   7.04   FLOW DEPTH(FEET) =   4.77
  TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =   25.69
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      480.50   25.69    0.652  0.60( 0.56) 0.93    1185.4   30600.00
      2      477.27   33.84    0.556  0.60( 0.56) 0.93    1578.8   21300.00
      3      472.72   37.33    0.528  0.60( 0.56) 0.93    1798.4   30410.00
      4      472.50   37.43    0.527  0.60( 0.56) 0.93    1804.3   30520.00
      5      467.68   38.66    0.517  0.60( 0.56) 0.93    1870.0   30210.00
      6      466.25   39.04    0.514  0.60( 0.56) 0.93    1901.4   30200.00
      7      458.56   41.23    0.499  0.60( 0.55) 0.92    2088.2   30540.00
      8      454.54   42.26    0.493  0.60( 0.55) 0.92    2170.0   30100.00
      9      451.34   42.58    0.491  0.60( 0.55) 0.92    2193.1   30510.00
     10      415.42   45.99    0.472  0.60( 0.55) 0.92    2431.0   30110.00
     11      413.15   46.46    0.469  0.60( 0.55) 0.91    2467.3   30500.00
     12      410.51   47.26    0.464  0.60( 0.55) 0.91    2526.9   30400.00
     13      391.96   54.45    0.430  0.60( 0.54) 0.90    3053.2   30300.00
     14      378.43   59.17    0.410  0.60( 0.54) 0.90    3367.5   21400.00
     15      304.68   84.91    0.353  0.60( 0.52) 0.87    4920.9   13100.00
     16      306.35   86.33    0.350  0.60( 0.52) 0.87    5001.8   13200.00
     17      306.23   92.80    0.338  0.60( 0.52) 0.87    5261.7   13210.00
     18      322.38  124.08    0.294  0.60( 0.51) 0.86    6356.2   13000.00
     19      319.05  127.51    0.292  0.60( 0.51) 0.85    6376.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     480.50  Tc(MIN.) =   25.69
  AREA-AVERAGED Fm(INCH/HR) =  0.56  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.93  EFFECTIVE AREA(ACRES) =    1185.40

********************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE = 15.1
--------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610307T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       12.33   24.09  0.60( 0.60) 1.00      98.0   30700.00
    TOTAL AREA(ACRES) =       98.0
```



```
********************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      480.50   25.69    0.652  0.60( 0.56) 0.93    1185.4   30600.00
      2      477.27   33.84    0.556  0.60( 0.56) 0.93    1578.8   21300.00
      3      472.72   37.33    0.528  0.60( 0.56) 0.93    1798.4   30410.00
      4      472.50   37.43    0.527  0.60( 0.56) 0.93    1804.3   30520.00
      5      467.68   38.66    0.517  0.60( 0.56) 0.93    1870.0   30210.00
      6      466.25   39.04    0.514  0.60( 0.56) 0.93    1901.4   30200.00
      7      458.56   41.23    0.499  0.60( 0.55) 0.92    2088.2   30540.00
      8      454.54   42.26    0.493  0.60( 0.55) 0.92    2170.0   30100.00
      9      451.34   42.58    0.491  0.60( 0.55) 0.92    2193.1   30510.00
     10      415.42   45.99    0.472  0.60( 0.55) 0.92    2431.0   30110.00
     11      413.15   46.46    0.469  0.60( 0.55) 0.91    2467.3   30500.00
     12      410.51   47.26    0.464  0.60( 0.55) 0.91    2526.9   30400.00
     13      391.96   54.45    0.430  0.60( 0.54) 0.90    3053.2   30300.00
     14      378.43   59.17    0.410  0.60( 0.54) 0.90    3367.5   21400.00
     15      304.68   84.91    0.353  0.60( 0.52) 0.87    4920.9   13100.00
     16      306.35   86.33    0.350  0.60( 0.52) 0.87    5001.8   13200.00
     17      306.23   92.80    0.338  0.60( 0.52) 0.87    5261.7   13210.00
     18      322.38  124.08    0.294  0.60( 0.51) 0.86    6356.2   13000.00
     19      319.05  127.51    0.292  0.60( 0.51) 0.85    6376.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       12.33   24.09    0.681  0.60( 0.60) 1.00      98.0   30700.00
  LONGEST FLOWPATH FROM NODE  30700.00 TO NODE  13305.40 =    5192.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      492.83   24.09    0.681  0.60( 0.56) 0.94    1209.7   30700.00
      2      488.38   25.69    0.652  0.60( 0.56) 0.94    1283.4   30600.00
      3      477.27   33.84    0.556  0.60( 0.56) 0.94    1676.8   21300.00
      4      472.72   37.33    0.528  0.60( 0.56) 0.94    1896.4   30410.00
      5      472.50   37.43    0.527  0.60( 0.56) 0.94    1902.3   30520.00
      6      467.68   38.66    0.517  0.60( 0.56) 0.93    1968.0   30210.00
      7      466.25   39.04    0.514  0.60( 0.56) 0.93    1999.4   30200.00
      8      458.56   41.23    0.499  0.60( 0.56) 0.93    2186.2   30540.00
      9      454.54   42.26    0.493  0.60( 0.56) 0.93    2268.0   30100.00
     10      451.34   42.58    0.491  0.60( 0.55) 0.93    2291.1   30510.00
     11      415.42   45.99    0.472  0.60( 0.55) 0.92    2529.0   30110.00
     12      413.15   46.46    0.469  0.60( 0.55) 0.92    2565.3   30500.00
     13      410.51   47.26    0.464  0.60( 0.55) 0.92    2624.9   30400.00
     14      391.96   54.45    0.430  0.60( 0.54) 0.91    3151.2   30300.00
     15      378.42   59.17    0.410  0.60( 0.54) 0.90    3465.5   21400.00
     16      304.68   84.91    0.353  0.60( 0.52) 0.87    5018.9   13100.00
     17      306.35   86.33    0.350  0.60( 0.52) 0.87    5099.8   13200.00
     18      306.23   92.80    0.338  0.60( 0.52) 0.87    5359.7   13210.00
     19      322.38  124.08    0.294  0.60( 0.51) 0.86    6454.2   13000.00
```

```
    20      319.05  127.51    0.292  0.60( 0.51) 0.86    6474.4   13010.00
   TOTAL AREA(ACRES) =      6474.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      492.83  Tc(MIN.) =   24.090
  EFFECTIVE AREA(ACRES) =   1209.68  AREA-AVERAGED Fm(INCH/HR) =  0.56
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =     6474.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.60 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    274.00  DOWNSTREAM(FEET) =    258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   733.85   CHANNEL SLOPE =  0.0218
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     492.83
  FLOW VELOCITY(FEET/SEC.) =   8.83   FLOW DEPTH(FEET) =   4.31
  TRAVEL TIME(MIN.) =   1.39   Tc(MIN.) =   25.48
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      492.83   25.48    0.655  0.60( 0.56) 0.94    1209.7   30700.00
      2      488.38   27.08    0.631  0.60( 0.56) 0.94    1283.4   30600.00
      3      477.27   35.24    0.545  0.60( 0.56) 0.94    1676.8   21300.00
      4      472.72   38.73    0.516  0.60( 0.56) 0.94    1896.4   30410.00
      5      472.50   38.83    0.515  0.60( 0.56) 0.94    1902.3   30520.00
      6      467.68   40.07    0.505  0.60( 0.56) 0.93    1968.0   30210.00
      7      466.25   40.44    0.503  0.60( 0.56) 0.93    1999.4   30200.00
      8      458.56   42.64    0.491  0.60( 0.56) 0.93    2186.2   30540.00
      9      454.54   43.67    0.485  0.60( 0.56) 0.93    2268.0   30100.00
     10      451.34   43.99    0.483  0.60( 0.55) 0.93    2291.1   30510.00
     11      415.42   47.44    0.463  0.60( 0.55) 0.92    2529.0   30110.00
     12      413.15   47.91    0.461  0.60( 0.55) 0.92    2565.3   30500.00
     13      410.51   48.71    0.456  0.60( 0.55) 0.92    2624.9   30400.00
     14      391.96   55.91    0.424  0.60( 0.54) 0.91    3151.2   30300.00
     15      378.42   60.65    0.405  0.60( 0.54) 0.90    3465.5   21400.00
     16      304.68   86.47    0.350  0.60( 0.52) 0.87    5018.9   13100.00
     17      306.35   87.88    0.347  0.60( 0.52) 0.87    5099.8   13200.00
     18      306.23   94.36    0.336  0.60( 0.52) 0.87    5359.7   13210.00
     19      322.38  125.62    0.293  0.60( 0.51) 0.86    6454.2   13000.00
     20      319.05  129.05    0.290  0.60( 0.51) 0.86    6474.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     492.83  Tc(MIN.) =   25.48
  AREA-AVERAGED Fm(INCH/HR) =  0.56  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.94  EFFECTIVE AREA(ACRES) =    1209.68

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.60 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.60 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610308T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        8.26   22.38  0.60( 0.60) 1.00      64.8   30800.00
    TOTAL AREA(ACRES) =       64.8

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.60 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      492.83   25.48    0.655  0.60( 0.56) 0.94    1209.7   30700.00
      2      488.38   27.08    0.631  0.60( 0.56) 0.94    1283.4   30600.00
      3      477.27   35.24    0.545  0.60( 0.56) 0.94    1676.8   21300.00
      4      472.72   38.73    0.516  0.60( 0.56) 0.94    1896.4   30410.00
      5      472.50   38.83    0.515  0.60( 0.56) 0.94    1902.3   30520.00
      6      467.68   40.07    0.505  0.60( 0.56) 0.93    1968.0   30210.00
      7      466.25   40.44    0.503  0.60( 0.56) 0.93    1999.4   30200.00
      8      458.56   42.64    0.491  0.60( 0.56) 0.93    2186.2   30540.00
      9      454.54   43.67    0.485  0.60( 0.56) 0.93    2268.0   30100.00
     10      451.34   43.99    0.483  0.60( 0.55) 0.93    2291.1   30510.00
     11      415.42   47.44    0.463  0.60( 0.55) 0.92    2529.0   30110.00
     12      413.15   47.91    0.461  0.60( 0.55) 0.92    2565.3   30500.00
     13      410.51   48.71    0.456  0.60( 0.55) 0.92    2624.9   30400.00
     14      391.96   55.91    0.424  0.60( 0.54) 0.91    3151.2   30300.00
     15      378.42   60.65    0.405  0.60( 0.54) 0.90    3465.5   21400.00
     16      304.68   86.47    0.350  0.60( 0.52) 0.87    5018.9   13100.00
     17      306.35   87.88    0.347  0.60( 0.52) 0.87    5099.8   13200.00
     18      306.23   94.36    0.336  0.60( 0.52) 0.87    5359.7   13210.00
     19      322.38  125.62    0.293  0.60( 0.51) 0.86    6454.2   13000.00
     20      319.05  129.05    0.290  0.60( 0.51) 0.86    6474.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        8.26   22.38    0.717  0.60( 0.60) 1.00      64.8   30800.00
  LONGEST FLOWPATH FROM NODE  30800.00 TO NODE  13305.60 =    4165.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      501.09   22.38    0.717  0.60( 0.57) 0.94    1127.6   30800.00
      2      496.72   25.48    0.655  0.60( 0.57) 0.94    1274.5   30700.00
      3      490.58   27.08    0.631  0.60( 0.57) 0.94    1348.2   30600.00
      4      477.27   35.24    0.545  0.60( 0.56) 0.94    1741.6   21300.00
      5      472.72   38.73    0.516  0.60( 0.56) 0.94    1961.3   30410.00
```

```
      6      472.50   38.83    0.515  0.60( 0.56) 0.94    1967.2   30520.00
      7      467.68   40.07    0.505  0.60( 0.56) 0.94    2032.9   30210.00
      8      466.25   40.44    0.503  0.60( 0.56) 0.94    2064.3   30200.00
      9      458.56   42.64    0.491  0.60( 0.56) 0.93    2251.0   30540.00
     10      454.54   43.67    0.485  0.60( 0.56) 0.93    2332.9   30100.00
     11      451.34   43.99    0.483  0.60( 0.56) 0.93    2356.0   30510.00
     12      415.42   47.44    0.463  0.60( 0.55) 0.92    2593.8   30110.00
     13      413.15   47.91    0.461  0.60( 0.55) 0.92    2630.1   30500.00
     14      410.51   48.71    0.456  0.60( 0.55) 0.92    2689.7   30400.00
     15      391.96   55.91    0.424  0.60( 0.54) 0.91    3216.1   30300.00
     16      378.42   60.65    0.405  0.60( 0.54) 0.90    3530.3   21400.00
     17      304.68   86.47    0.350  0.60( 0.52) 0.87    5083.8   13100.00
     18      306.35   87.88    0.347  0.60( 0.52) 0.87    5164.6   13200.00
     19      306.23   94.36    0.336  0.60( 0.52) 0.87    5424.6   13210.00
     20      322.38  125.62    0.293  0.60( 0.52) 0.86    6519.1   13000.00
     21      319.05  129.05    0.290  0.60( 0.51) 0.86    6539.3   13010.00
   TOTAL AREA(ACRES) =      6539.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      501.09  Tc(MIN.) =   22.382
  EFFECTIVE AREA(ACRES) =   1127.60  AREA-AVERAGED Fm(INCH/HR) =  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =     6539.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.80 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    254.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.16   CHANNEL SLOPE =  0.0042
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     501.09
  FLOW VELOCITY(FEET/SEC.) =   4.79   FLOW DEPTH(FEET) =   5.90
  TRAVEL TIME(MIN.) =   3.29   Tc(MIN.) =   25.67
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.80 =   45711.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      501.09   25.67    0.652  0.60( 0.57) 0.94    1127.6   30800.00
      2      496.72   28.78    0.605  0.60( 0.57) 0.94    1274.5   30700.00
      3      490.58   30.38    0.584  0.60( 0.57) 0.94    1348.2   30600.00
      4      477.27   38.57    0.517  0.60( 0.56) 0.94    1741.6   21300.00
      5      472.72   42.07    0.494  0.60( 0.56) 0.94    1961.3   30410.00
      6      472.50   42.17    0.493  0.60( 0.56) 0.94    1967.2   30520.00
      7      467.68   43.41    0.486  0.60( 0.56) 0.94    2032.9   30210.00
      8      466.25   43.79    0.484  0.60( 0.56) 0.94    2064.3   30200.00
      9      458.56   46.01    0.472  0.60( 0.56) 0.93    2251.0   30540.00
     10      454.54   47.04    0.466  0.60( 0.56) 0.93    2332.9   30100.00
     11      451.34   47.37    0.464  0.60( 0.56) 0.93    2356.0   30510.00
     12      415.42   50.89    0.445  0.60( 0.55) 0.92    2593.8   30110.00
     13      413.15   51.36    0.443  0.60( 0.55) 0.92    2630.1   30500.00
     14      410.51   52.17    0.440  0.60( 0.55) 0.92    2689.7   30400.00
     15      391.96   59.41    0.409  0.60( 0.54) 0.91    3216.1   30300.00
```



```
     16      378.42   64.18    0.397  0.60( 0.54) 0.90    3530.3   21400.00
     17      304.68   90.20    0.342  0.60( 0.52) 0.87    5083.8   13100.00
     18      306.35   91.61    0.340  0.60( 0.52) 0.87    5164.6   13200.00
     19      306.23   98.09    0.330  0.60( 0.52) 0.87    5424.6   13210.00
     20      322.38  129.29    0.290  0.60( 0.52) 0.86    6519.1   13000.00
     21      319.05  132.74    0.287  0.60( 0.51) 0.86    6539.3   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     501.09  Tc(MIN.) =   25.67
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.94  EFFECTIVE AREA(ACRES) =    1127.60

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610309T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       10.80   21.16  0.60( 0.60) 1.00      65.9   30900.00
      2       10.79   21.17  0.60( 0.60) 1.00      65.9   30910.00
    TOTAL AREA(ACRES) =       65.9

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      501.09   25.67    0.652  0.60( 0.57) 0.94    1127.6   30800.00
      2      496.72   28.78    0.605  0.60( 0.57) 0.94    1274.5   30700.00
      3      490.58   30.38    0.584  0.60( 0.57) 0.94    1348.2   30600.00
      4      477.27   38.57    0.517  0.60( 0.56) 0.94    1741.6   21300.00
      5      472.72   42.07    0.494  0.60( 0.56) 0.94    1961.3   30410.00
      6      472.50   42.17    0.493  0.60( 0.56) 0.94    1967.2   30520.00
      7      467.68   43.41    0.486  0.60( 0.56) 0.94    2032.9   30210.00
      8      466.25   43.79    0.484  0.60( 0.56) 0.94    2064.3   30200.00
      9      458.56   46.01    0.472  0.60( 0.56) 0.93    2251.0   30540.00
     10      454.54   47.04    0.466  0.60( 0.56) 0.93    2332.9   30100.00
     11      451.34   47.37    0.464  0.60( 0.56) 0.93    2356.0   30510.00
     12      415.42   50.89    0.445  0.60( 0.55) 0.92    2593.8   30110.00
     13      413.15   51.36    0.443  0.60( 0.55) 0.92    2630.1   30500.00
     14      410.51   52.17    0.440  0.60( 0.55) 0.92    2689.7   30400.00
     15      391.96   59.41    0.409  0.60( 0.54) 0.91    3216.1   30300.00
     16      378.42   64.18    0.397  0.60( 0.54) 0.90    3530.3   21400.00
     17      304.68   90.20    0.342  0.60( 0.52) 0.87    5083.8   13100.00
     18      306.35   91.61    0.340  0.60( 0.52) 0.87    5164.6   13200.00
     19      306.23   98.09    0.330  0.60( 0.52) 0.87    5424.6   13210.00
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    20      322.38  129.29    0.290  0.60( 0.52) 0.86    6519.1   13000.00
    21      319.05  132.74    0.287  0.60( 0.51) 0.86    6539.3   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.80 =   45711.71 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.80   21.16    0.742  0.60( 0.60) 1.00      65.9   30900.00
      2       10.79   21.17    0.742  0.60( 0.60) 1.00      65.9   30910.00
  LONGEST FLOWPATH FROM NODE  30900.00 TO NODE  13305.80 =    3403.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      511.89   21.16    0.742  0.60( 0.57) 0.95     995.2   30900.00
      2      511.88   21.17    0.742  0.60( 0.57) 0.95     995.6   30910.00
      3      505.05   25.67    0.652  0.60( 0.57) 0.95    1193.5   30800.00
      4      497.15   28.78    0.605  0.60( 0.57) 0.95    1340.4   30700.00
      5      490.58   30.38    0.584  0.60( 0.57) 0.95    1414.1   30600.00
      6      477.27   38.57    0.517  0.60( 0.57) 0.94    1807.5   21300.00
      7      472.72   42.07    0.494  0.60( 0.56) 0.94    2027.2   30410.00
      8      472.50   42.17    0.493  0.60( 0.56) 0.94    2033.1   30520.00
      9      467.68   43.41    0.486  0.60( 0.56) 0.94    2098.8   30210.00
     10      466.25   43.79    0.484  0.60( 0.56) 0.94    2130.2   30200.00
     11      458.56   46.01    0.472  0.60( 0.56) 0.93    2317.0   30540.00
     12      454.54   47.04    0.466  0.60( 0.56) 0.93    2398.8   30100.00
     13      451.34   47.37    0.464  0.60( 0.56) 0.93    2421.9   30510.00
     14      415.42   50.89    0.445  0.60( 0.55) 0.92    2659.8   30110.00
     15      413.15   51.36    0.443  0.60( 0.55) 0.92    2696.1   30500.00
     16      410.51   52.17    0.440  0.60( 0.55) 0.92    2755.6   30400.00
     17      391.96   59.41    0.409  0.60( 0.55) 0.91    3282.0   30300.00
     18      378.42   64.18    0.397  0.60( 0.54) 0.90    3596.3   21400.00
     19      304.68   90.20    0.342  0.60( 0.52) 0.87    5149.7   13100.00
     20      306.35   91.61    0.340  0.60( 0.52) 0.87    5230.5   13200.00
     21      306.23   98.09    0.330  0.60( 0.52) 0.87    5490.5   13210.00
     22      322.38  129.29    0.290  0.60( 0.52) 0.86    6585.0   13000.00
     23      319.05  132.74    0.287  0.60( 0.52) 0.86    6605.2   13010.00
    TOTAL AREA(ACRES) =      6605.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      511.89  Tc(MIN.) =   21.158
  EFFECTIVE AREA(ACRES) =    995.17  AREA-AVERAGED Fm(INCH/HR) =  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =     6605.2
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.80 =   45711.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13306.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    254.00  DOWNSTREAM(FEET) =    245.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   583.12   CHANNEL SLOPE =  0.0146
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.716
  SUBAREA LOSS RATE DATA(AMC  II):
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```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       68.77      0.60      0.998     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     515.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.69
  AVERAGE FLOW DEPTH(FEET) =   4.73   TRAVEL TIME(MIN.) =   1.26
  Tc(MIN.) =   22.42
  SUBAREA AREA(ACRES) =    68.77       SUBAREA RUNOFF(CFS) =    7.25
  EFFECTIVE AREA(ACRES) =   1063.94     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =     6673.9         PEAK FLOW RATE(CFS) =     511.89
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.72   FLOW VELOCITY(FEET/SEC.) =   7.67
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13306.00 =   46294.83 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      511.89   22.42    0.716  0.60( 0.57) 0.95    1063.9   30900.00
      2      511.88   22.43    0.716  0.60( 0.57) 0.95    1064.4   30910.00
      3      505.05   26.95    0.633  0.60( 0.57) 0.95    1262.3   30800.00
      4      497.15   30.05    0.587  0.60( 0.57) 0.95    1409.2   30700.00
      5      490.58   31.66    0.574  0.60( 0.57) 0.95    1482.9   30600.00
      6      477.27   39.86    0.507  0.60( 0.57) 0.94    1876.3   21300.00
      7      472.72   43.36    0.487  0.60( 0.56) 0.94    2095.9   30410.00
      8      472.50   43.46    0.486  0.60( 0.56) 0.94    2101.8   30520.00
      9      467.68   44.71    0.479  0.60( 0.56) 0.94    2167.5   30210.00
     10      466.25   45.09    0.477  0.60( 0.56) 0.94    2198.9   30200.00
     11      458.56   47.31    0.464  0.60( 0.56) 0.93    2385.7   30540.00
     12      454.54   48.35    0.458  0.60( 0.56) 0.93    2467.5   30100.00
     13      451.34   48.68    0.456  0.60( 0.56) 0.93    2490.6   30510.00
     14      415.42   52.22    0.439  0.60( 0.55) 0.92    2728.5   30110.00
     15      413.15   52.70    0.437  0.60( 0.55) 0.92    2764.8   30500.00
     16      410.51   53.51    0.434  0.60( 0.55) 0.92    2824.4   30400.00
     17      391.96   60.77    0.405  0.60( 0.55) 0.91    3350.7   30300.00
     18      378.42   65.54    0.394  0.60( 0.54) 0.90    3665.0   21400.00
     19      304.68   91.64    0.340  0.60( 0.53) 0.88    5218.4   13100.00
     20      306.35   93.05    0.338  0.60( 0.52) 0.88    5299.3   13200.00
     21      306.23   99.52    0.328  0.60( 0.52) 0.87    5559.3   13210.00
     22      322.38  130.71    0.289  0.60( 0.52) 0.86    6653.8   13000.00
     23      319.05  134.16    0.286  0.60( 0.52) 0.86    6673.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     511.89  Tc(MIN.) =   22.42
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1063.94

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13307.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    245.50  DOWNSTREAM(FEET) =    220.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1543.21   CHANNEL SLOPE =  0.0165
```

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 511.89
FLOW VELOCITY(FEET/SEC.) = 8.05 FLOW DEPTH(FEET) = 4.61
TRAVEL TIME(MIN.) = 3.20 Tc(MIN.) = 25.62
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	511.89	25.62	0.653	0.60(0.57)	0.95	1063.9	30900.00
2	511.88	25.63	0.653	0.60(0.57)	0.95	1064.4	30910.00
3	505.05	30.15	0.586	0.60(0.57)	0.95	1262.3	30800.00
4	497.15	33.28	0.561	0.60(0.57)	0.95	1409.2	30700.00
5	490.58	34.90	0.547	0.60(0.57)	0.95	1482.9	30600.00
6	477.27	43.12	0.488	0.60(0.57)	0.94	1876.3	21300.00
7	472.72	46.63	0.468	0.60(0.56)	0.94	2095.9	30410.00
8	472.50	46.72	0.467	0.60(0.56)	0.94	2101.8	30520.00
9	467.68	47.98	0.460	0.60(0.56)	0.94	2167.5	30210.00
10	466.25	48.36	0.458	0.60(0.56)	0.94	2198.9	30200.00
11	458.56	50.60	0.446	0.60(0.56)	0.93	2385.7	30540.00
12	454.54	51.64	0.442	0.60(0.56)	0.93	2467.5	30100.00
13	451.34	51.98	0.440	0.60(0.56)	0.93	2490.6	30510.00
14	415.42	55.60	0.425	0.60(0.55)	0.92	2728.5	30110.00
15	413.15	56.07	0.423	0.60(0.55)	0.92	2764.8	30500.00
16	410.51	56.89	0.420	0.60(0.55)	0.92	2824.4	30400.00
17	391.96	64.19	0.397	0.60(0.55)	0.91	3350.7	30300.00
18	378.42	69.00	0.387	0.60(0.54)	0.90	3665.0	21400.00
19	304.68	95.29	0.334	0.60(0.53)	0.88	5218.4	13100.00
20	306.35	96.69	0.332	0.60(0.52)	0.88	5299.3	13200.00
21	306.23	103.16	0.323	0.60(0.52)	0.87	5559.3	13210.00
22	322.38	134.30	0.286	0.60(0.52)	0.86	6653.8	13000.00
23	319.05	137.76	0.283	0.60(0.52)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 511.89 Tc(MIN.) = 25.62
AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1063.94

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610310T.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.13	31.23	0.60(0.60)	1.00	97.9	31000.00

TOTAL AREA(ACRES) = 97.9

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	511.89	25.62	0.653	0.60(0.57)	0.95	1063.9	30900.00
2	511.88	25.63	0.653	0.60(0.57)	0.95	1064.4	30910.00
3	505.05	30.15	0.586	0.60(0.57)	0.95	1262.3	30800.00
4	497.15	33.28	0.561	0.60(0.57)	0.95	1409.2	30700.00
5	490.58	34.90	0.547	0.60(0.57)	0.95	1482.9	30600.00
6	477.27	43.12	0.488	0.60(0.57)	0.94	1876.3	21300.00
7	472.72	46.63	0.468	0.60(0.56)	0.94	2095.9	30410.00
8	472.50	46.72	0.467	0.60(0.56)	0.94	2101.8	30520.00
9	467.68	47.98	0.460	0.60(0.56)	0.94	2167.5	30210.00
10	466.25	48.36	0.458	0.60(0.56)	0.94	2198.9	30200.00
11	458.56	50.60	0.446	0.60(0.56)	0.93	2385.7	30540.00
12	454.54	51.64	0.442	0.60(0.56)	0.93	2467.5	30100.00
13	451.34	51.98	0.440	0.60(0.56)	0.93	2490.6	30510.00
14	415.42	55.60	0.425	0.60(0.55)	0.92	2728.5	30110.00
15	413.15	56.07	0.423	0.60(0.55)	0.92	2764.8	30500.00
16	410.51	56.89	0.420	0.60(0.55)	0.92	2824.4	30400.00
17	391.96	64.19	0.397	0.60(0.55)	0.91	3350.7	30300.00
18	378.42	69.00	0.387	0.60(0.54)	0.90	3665.0	21400.00
19	304.68	95.29	0.334	0.60(0.53)	0.88	5218.4	13100.00
20	306.35	96.69	0.332	0.60(0.52)	0.88	5299.3	13200.00
21	306.23	103.16	0.323	0.60(0.52)	0.87	5559.3	13210.00
22	322.38	134.30	0.286	0.60(0.52)	0.86	6653.8	13000.00
23	319.05	137.76	0.283	0.60(0.52)	0.86	6673.9	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.13	31.23	0.577	0.60(0.60)	1.00	97.9	31000.00

LONGEST FLOWPATH FROM NODE 31000.00 TO NODE 13307.00 = 5162.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	515.72	25.62	0.653	0.60(0.57)	0.95	1144.2	30900.00
2	515.71	25.63	0.653	0.60(0.57)	0.95	1144.7	30910.00
3	509.09	30.15	0.586	0.60(0.57)	0.95	1356.8	30800.00
4	506.46	31.23	0.577	0.60(0.57)	0.95	1410.7	31000.00
5	501.16	33.28	0.561	0.60(0.57)	0.95	1507.1	30700.00
6	494.50	34.90	0.547	0.60(0.57)	0.95	1580.8	30600.00
7	480.76	43.12	0.488	0.60(0.57)	0.95	1974.2	21300.00
8	476.07	46.63	0.468	0.60(0.57)	0.94	2193.8	30410.00
9	475.84	46.72	0.467	0.60(0.57)	0.94	2199.7	30520.00
10	470.97	47.98	0.460	0.60(0.57)	0.94	2265.4	30210.00
11	469.52	48.36	0.458	0.60(0.56)	0.94	2296.8	30200.00
12	461.74	50.60	0.446	0.60(0.56)	0.94	2483.6	30540.00
13	457.70	51.64	0.442	0.60(0.56)	0.93	2565.4	30100.00
14	454.48	51.98	0.440	0.60(0.56)	0.93	2588.5	30510.00
15	418.46	55.60	0.425	0.60(0.56)	0.93	2826.4	30110.00
16	416.17	56.07	0.423	0.60(0.56)	0.93	2862.7	30500.00
17	413.51	56.89	0.420	0.60(0.55)	0.92	2922.3	30400.00

18	394.80	64.19	0.397	0.60(0.55)	0.91	3448.6	30300.00
19	381.19	69.00	0.387	0.60(0.54)	0.91	3762.9	21400.00
20	307.07	95.29	0.334	0.60(0.53)	0.88	5316.3	13100.00
21	308.73	96.69	0.332	0.60(0.53)	0.88	5397.2	13200.00
22	308.53	103.16	0.323	0.60(0.53)	0.88	5657.1	13210.00
23	324.43	134.30	0.286	0.60(0.52)	0.86	6751.6	13000.00
24	321.07	137.76	0.283	0.60(0.52)	0.86	6771.8	13010.00

TOTAL AREA(ACRES) = 6771.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 515.72 Tc(MIN.) = 25.619
EFFECTIVE AREA(ACRES) = 1144.24 AREA-AVERAGED Fm(INCH/HR) = 0.57
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95
TOTAL AREA(ACRES) = 6771.8
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 220.00 DOWNSTREAM(FEET) = 212.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 925.62 CHANNEL SLOPE = 0.0086
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 515.72
FLOW VELOCITY(FEET/SEC.) = 6.32 FLOW DEPTH(FEET) = 5.22
TRAVEL TIME(MIN.) = 2.44 Tc(MIN.) = 28.06
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	515.72	28.06	0.616	0.60(0.57)	0.95	1144.2	30900.00
2	515.71	28.07	0.616	0.60(0.57)	0.95	1144.7	30910.00
3	509.09	32.60	0.566	0.60(0.57)	0.95	1356.8	30800.00
4	506.46	33.68	0.557	0.60(0.57)	0.95	1410.7	31000.00
5	501.16	35.74	0.541	0.60(0.57)	0.95	1507.1	30700.00
6	494.50	37.37	0.527	0.60(0.57)	0.95	1580.8	30600.00
7	480.76	45.60	0.474	0.60(0.57)	0.95	1974.2	21300.00
8	476.07	49.12	0.454	0.60(0.57)	0.94	2193.8	30410.00
9	475.84	49.22	0.453	0.60(0.57)	0.94	2199.7	30520.00
10	470.97	50.48	0.447	0.60(0.57)	0.94	2265.4	30210.00
11	469.52	50.86	0.445	0.60(0.56)	0.94	2296.8	30200.00
12	461.74	53.11	0.436	0.60(0.56)	0.94	2483.6	30540.00
13	457.70	54.16	0.431	0.60(0.56)	0.93	2565.4	30100.00
14	454.48	54.50	0.430	0.60(0.56)	0.93	2588.5	30510.00
15	418.46	58.17	0.414	0.60(0.56)	0.93	2826.4	30110.00
16	416.17	58.65	0.412	0.60(0.56)	0.93	2862.7	30500.00
17	413.51	59.47	0.409	0.60(0.55)	0.92	2922.3	30400.00
18	394.80	66.80	0.392	0.60(0.55)	0.91	3448.6	30300.00
19	381.19	71.63	0.381	0.60(0.54)	0.91	3762.9	21400.00
20	307.07	98.06	0.330	0.60(0.53)	0.88	5316.3	13100.00
21	308.73	99.47	0.328	0.60(0.53)	0.88	5397.2	13200.00
22	308.53	105.93	0.319	0.60(0.53)	0.88	5657.1	13210.00
23	324.43	137.04	0.284	0.60(0.52)	0.86	6751.6	13000.00
24	321.07	140.51	0.281	0.60(0.52)	0.86	6771.8	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 515.72 Tc(MIN.) = 28.06
AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1144.24

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610212T.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.29	62.94	0.60(0.60)	1.00	342.8	21200.00

TOTAL AREA(ACRES) = 342.8

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	515.72	28.06	0.616	0.60(0.57)	0.95	1144.2	30900.00
2	515.71	28.07	0.616	0.60(0.57)	0.95	1144.7	30910.00
3	509.09	32.60	0.566	0.60(0.57)	0.95	1356.8	30800.00
4	506.46	33.68	0.557	0.60(0.57)	0.95	1410.7	31000.00
5	501.16	35.74	0.541	0.60(0.57)	0.95	1507.1	30700.00
6	494.50	37.37	0.527	0.60(0.57)	0.95	1580.8	30600.00
7	480.76	45.60	0.474	0.60(0.57)	0.95	1974.2	21300.00
8	476.07	49.12	0.454	0.60(0.57)	0.94	2193.8	30410.00
9	475.84	49.22	0.453	0.60(0.57)	0.94	2199.7	30520.00
10	470.97	50.48	0.447	0.60(0.57)	0.94	2265.4	30210.00
11	469.52	50.86	0.445	0.60(0.56)	0.94	2296.8	30200.00
12	461.74	53.11	0.436	0.60(0.56)	0.94	2483.6	30540.00
13	457.70	54.16	0.431	0.60(0.56)	0.93	2565.4	30100.00
14	454.48	54.50	0.430	0.60(0.56)	0.93	2588.5	30510.00
15	418.46	58.17	0.414	0.60(0.56)	0.93	2826.4	30110.00
16	416.17	58.65	0.412	0.60(0.56)	0.93	2862.7	30500.00
17	413.51	59.47	0.409	0.60(0.55)	0.92	2922.3	30400.00
18	394.80	66.80	0.392	0.60(0.55)	0.91	3448.6	30300.00
19	381.19	71.63	0.381	0.60(0.54)	0.91	3762.9	21400.00
20	307.07	98.06	0.330	0.60(0.53)	0.88	5316.3	13100.00
21	308.73	99.47	0.328	0.60(0.53)	0.88	5397.2	13200.00
22	308.53	105.93	0.319	0.60(0.53)	0.88	5657.1	13210.00
23	324.43	137.04	0.284	0.60(0.52)	0.86	6751.6	13000.00
24	321.07	140.51	0.281	0.60(0.52)	0.86	6771.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

```
 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM        Q      Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1         8.29   62.94     0.400  0.60( 0.60) 1.00      342.8   21200.00
 LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  13308.00 =   11049.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1       521.42   28.06     0.616  0.60( 0.58) 0.96    1297.1   30900.00
     2       521.41   28.07     0.616  0.60( 0.58) 0.96    1297.6   30910.00
     3       515.17   32.60     0.566  0.60( 0.57) 0.96    1534.4   30800.00
     4       512.64   33.68     0.557  0.60( 0.57) 0.96    1594.2   31000.00
     5       507.52   35.74     0.541  0.60( 0.57) 0.96    1701.7   30700.00
     6       500.99   37.37     0.527  0.60( 0.57) 0.96    1784.3   30600.00
     7       487.88   45.60     0.474  0.60( 0.57) 0.95    2222.5   21300.00
     8       483.41   49.12     0.454  0.60( 0.57) 0.95    2461.3   30410.00
     9       483.19   49.22     0.453  0.60( 0.57) 0.95    2467.8   30520.00
    10       478.40   50.48     0.447  0.60( 0.57) 0.95    2540.3   30210.00
    11       476.98   50.86     0.445  0.60( 0.57) 0.95    2573.8   30200.00
    12       469.36   53.11     0.436  0.60( 0.57) 0.94    2772.8   30540.00
    13       465.39   54.16     0.431  0.60( 0.56) 0.94    2860.4   30100.00
    14       462.20   54.50     0.430  0.60( 0.56) 0.94    2885.3   30510.00
    15       426.39   58.17     0.414  0.60( 0.56) 0.93    3143.2   30110.00
    16       424.13   58.65     0.412  0.60( 0.56) 0.93    3182.1   30500.00
    17       421.51   59.47     0.409  0.60( 0.56) 0.93    3246.1   30400.00
    18       412.94   62.94     0.400  0.60( 0.56) 0.93    3514.4   21200.00
    19       402.92   66.80     0.392  0.60( 0.55) 0.92    3791.4   30300.00
    20       389.10   71.63     0.381  0.60( 0.55) 0.91    4105.7   21400.00
    21       313.92   98.06     0.330  0.60( 0.53) 0.89    5659.1   13100.00
    22       315.53   99.47     0.328  0.60( 0.53) 0.88    5740.0   13200.00
    23       315.14  105.93     0.319  0.60( 0.53) 0.88    5999.9   13210.00
    24       330.31  137.04     0.284  0.60( 0.52) 0.87    7094.4   13000.00
    25       326.89  140.51     0.281  0.60( 0.52) 0.87    7114.6   13010.00
   TOTAL AREA(ACRES) =      7114.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      521.42  Tc(MIN.) =   28.060
 EFFECTIVE AREA(ACRES) =   1297.06  AREA-AVERAGED Fm(INCH/HR) =  0.58
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     7114.6
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  12
----------------------------------------------------------------------------
```



```
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S29.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM        Q      Tc       Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)  (MIN.)   (INCH/HR)           (ACRES)     NODE
     1       503.93   23.78  0.60( 0.59) 0.98    1642.7   50400.00
     2       710.45   51.18  0.60( 0.59) 0.98    4992.7   40510.00
     3       582.48   66.27  0.60( 0.59) 0.99    7106.6   50100.00
     4       557.32   90.91  0.60( 0.59) 0.99   10674.2   31400.00
     5       559.68  102.42  0.60( 0.59) 0.99   12314.0   40100.00
     6       600.65  114.80  0.60( 0.59) 0.99   14046.5   11831.00
     7       701.25  138.03  0.60( 0.59) 0.99   17741.6   11530.00
     8       790.85  157.50  0.60( 0.59) 0.99   21898.4   11000.00
     9       904.69  179.78  0.60( 0.60) 0.99   28689.4   10850.00
    10       831.17  195.47  0.60( 0.60) 0.99   32037.1   11220.00
    11       775.07  206.87  0.60( 0.60) 0.99   33792.3   10910.00
    12       626.01  247.39  0.60( 0.59) 0.99   40376.2   12410.00
    13       591.12  280.30  0.60( 0.59) 0.99   46454.5   12261.00
    14       579.95  293.18  0.60( 0.59) 0.99   47939.3   10410.00
    15       568.93  305.35  0.60( 0.59) 0.99   49045.1   12101.10
    16       544.05  332.73  0.60( 0.59) 0.99   51422.8   10200.00
    17       531.24  346.10  0.60( 0.59) 0.99   52362.5   12010.00
    18       493.85  375.45  0.60( 0.59) 0.99   53039.9   10210.00
    19       439.23  424.61  0.60( 0.59) 0.99   53541.6   12000.00
    20       406.62  491.65  0.60( 0.59) 0.99   54110.0   10100.00
   TOTAL AREA(ACRES) =    54110.0

****************************************************************************
 FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM        Q      Tc       Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)  (MIN.)   (INCH/HR)           (ACRES)     NODE
     1       503.93   23.78  0.60( 0.59) 0.98    1642.7   50400.00
     2       710.45   51.18  0.60( 0.59) 0.98    4992.7   40510.00
     3       582.48   66.27  0.60( 0.59) 0.99    7106.6   50100.00
     4       557.32   90.91  0.60( 0.59) 0.99   10674.2   31400.00
     5       559.68  102.42  0.60( 0.59) 0.99   12314.0   40100.00
     6       600.65  114.80  0.60( 0.59) 0.99   14046.5   11831.00
     7       701.25  138.03  0.60( 0.59) 0.99   17741.6   11530.00
     8       790.85  157.50  0.60( 0.59) 0.99   21898.4   11000.00
     9       904.69  179.78  0.60( 0.60) 0.99   28689.4   10850.00
    10       831.17  195.47  0.60( 0.60) 0.99   32037.1   11220.00
    11       775.07  206.87  0.60( 0.60) 0.99   33792.3   10910.00
    12       626.01  247.39  0.60( 0.59) 0.99   40376.2   12410.00
    13       591.12  280.30  0.60( 0.59) 0.99   46454.5   12261.00
    14       579.95  293.18  0.60( 0.59) 0.99   47939.3   10410.00
    15       568.93  305.35  0.60( 0.59) 0.99   49045.1   12101.10
```

```
    16      544.05  332.73  0.60( 0.59) 0.99   51422.8   10200.00
    17      531.24  346.10  0.60( 0.59) 0.99   52362.5   12010.00
    18      493.85  375.45  0.60( 0.59) 0.99   53039.9   10210.00
    19      439.23  424.61  0.60( 0.59) 0.99   53541.6   12000.00
    20      406.62  491.65  0.60( 0.59) 0.99   54110.0   10100.00
   TOTAL AREA(ACRES) =     54110.0

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  13308.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    213.00  DOWNSTREAM(FEET) =    212.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1389.52   CHANNEL SLOPE =  0.0007
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     904.69
  FLOW VELOCITY(FEET/SEC.) =   3.55   FLOW DEPTH(FEET) =   9.21
  TRAVEL TIME(MIN.) =   6.52   Tc(MIN.) =  186.30
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      503.93   31.32    0.576  0.60( 0.59) 0.98    1642.7   50400.00
      2      710.45   58.11    0.414  0.60( 0.59) 0.98    4992.7   40510.00
      3      582.48   73.54    0.377  0.60( 0.59) 0.99    7106.6   50100.00
      4      557.32   98.28    0.330  0.60( 0.59) 0.99   10674.2   31400.00
      5      559.68  109.77    0.313  0.60( 0.59) 0.99   12314.0   40100.00
      6      600.65  122.02    0.296  0.60( 0.59) 0.99   14046.5   11831.00
      7      701.25  144.98    0.277  0.60( 0.59) 0.99   17741.6   11530.00
      8      790.85  164.24    0.261  0.60( 0.59) 0.99   21898.4   11000.00
      9      904.69  186.30    0.246  0.60( 0.60) 0.99   28689.4   10850.00
     10      831.17  202.12    0.240  0.60( 0.60) 0.99   32037.1   11220.00
     11      775.07  213.64    0.236  0.60( 0.60) 0.99   33792.3   10910.00
     12      626.01  254.53    0.221  0.60( 0.59) 0.99   40376.2   12410.00
     13      591.12  287.55    0.209  0.60( 0.59) 0.99   46454.5   12261.00
     14      579.95  300.47    0.204  0.60( 0.59) 0.99   47939.3   10410.00
     15      568.93  312.67    0.199  0.60( 0.59) 0.99   49045.1   12101.10
     16      544.05  340.13    0.189  0.60( 0.59) 0.99   51422.8   10200.00
     17      531.24  353.55    0.184  0.60( 0.59) 0.99   52362.5   12010.00
     18      493.85  383.04    0.180  0.60( 0.59) 0.99   53039.9   10210.00
     19      439.23  432.43    0.175  0.60( 0.59) 0.99   53541.6   12000.00
     20      406.62  499.61    0.169  0.60( 0.59) 0.99   54110.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     904.69  Tc(MIN.) =  186.30
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   28689.43

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      503.93   31.32    0.576  0.60( 0.59) 0.98    1642.7   50400.00
      2      710.45   58.11    0.414  0.60( 0.59) 0.98    4992.7   40510.00
      3      582.48   73.54    0.377  0.60( 0.59) 0.99    7106.6   50100.00
      4      557.32   98.28    0.330  0.60( 0.59) 0.99   10674.2   31400.00
      5      559.68  109.77    0.313  0.60( 0.59) 0.99   12314.0   40100.00
      6      600.65  122.02    0.296  0.60( 0.59) 0.99   14046.5   11831.00
      7      701.25  144.98    0.277  0.60( 0.59) 0.99   17741.6   11530.00
      8      790.85  164.24    0.261  0.60( 0.59) 0.99   21898.4   11000.00
      9      904.69  186.30    0.246  0.60( 0.60) 0.99   28689.4   10850.00
     10      831.17  202.12    0.240  0.60( 0.60) 0.99   32037.1   11220.00
     11      775.07  213.64    0.236  0.60( 0.60) 0.99   33792.3   10910.00
     12      626.01  254.53    0.221  0.60( 0.59) 0.99   40376.2   12410.00
     13      591.12  287.55    0.209  0.60( 0.59) 0.99   46454.5   12261.00
     14      579.95  300.47    0.204  0.60( 0.59) 0.99   47939.3   10410.00
     15      568.93  312.67    0.199  0.60( 0.59) 0.99   49045.1   12101.10
     16      544.05  340.13    0.189  0.60( 0.59) 0.99   51422.8   10200.00
     17      531.24  353.55    0.184  0.60( 0.59) 0.99   52362.5   12010.00
     18      493.85  383.04    0.180  0.60( 0.59) 0.99   53039.9   10210.00
     19      439.23  432.43    0.175  0.60( 0.59) 0.99   53541.6   12000.00
     20      406.62  499.61    0.169  0.60( 0.59) 0.99   54110.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      521.42   28.06    0.616  0.60( 0.58) 0.96    1297.1   30900.00
      2      521.41   28.07    0.616  0.60( 0.58) 0.96    1297.6   30910.00
      3      515.17   32.60    0.566  0.60( 0.57) 0.96    1534.4   30800.00
      4      512.64   33.68    0.557  0.60( 0.57) 0.96    1594.2   31000.00
      5      507.52   35.74    0.541  0.60( 0.57) 0.96    1701.7   30700.00
      6      500.99   37.37    0.527  0.60( 0.57) 0.96    1784.3   30600.00
      7      487.88   45.60    0.474  0.60( 0.57) 0.95    2222.5   21300.00
      8      483.41   49.12    0.454  0.60( 0.57) 0.95    2461.3   30410.00
      9      483.19   49.22    0.453  0.60( 0.57) 0.95    2467.8   30520.00
     10      478.40   50.48    0.447  0.60( 0.57) 0.95    2540.3   30210.00
     11      476.98   50.86    0.445  0.60( 0.57) 0.95    2573.8   30200.00
     12      469.36   53.11    0.436  0.60( 0.57) 0.94    2772.8   30540.00
     13      465.39   54.16    0.431  0.60( 0.56) 0.94    2860.4   30100.00
     14      462.20   54.50    0.430  0.60( 0.56) 0.94    2885.3   30510.00
     15      426.39   58.17    0.414  0.60( 0.56) 0.93    3143.2   30110.00
     16      424.13   58.65    0.412  0.60( 0.56) 0.93    3182.1   30500.00
     17      421.51   59.47    0.409  0.60( 0.56) 0.93    3246.1   30400.00
     18      412.94   62.94    0.400  0.60( 0.56) 0.93    3514.4   21200.00
     19      402.92   66.80    0.392  0.60( 0.55) 0.92    3791.4   30300.00
     20      389.10   71.63    0.381  0.60( 0.55) 0.91    4105.7   21400.00
     21      313.92   98.06    0.330  0.60( 0.53) 0.89    5659.1   13100.00
     22      315.53   99.47    0.328  0.60( 0.53) 0.88    5740.0   13200.00
     23      315.14  105.93    0.319  0.60( 0.53) 0.88    5999.9   13210.00
     24      330.31  137.04    0.284  0.60( 0.52) 0.87    7094.4   13000.00
     25      326.89  140.51    0.281  0.60( 0.52) 0.87    7114.6   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1004.03   28.06    0.616  0.60( 0.58) 0.97    2768.6   30900.00
      2     1004.08   28.07    0.616  0.60( 0.58) 0.97    2769.6   30910.00
```

3	1020.86	31.32	0.576	0.60(0.58)	0.97	3110.1	50400.00
4	1028.97	32.60	0.566	0.60(0.58)	0.97	3337.1	30800.00
5	1034.76	33.68	0.557	0.60(0.58)	0.97	3532.0	31000.00
6	1045.48	35.74	0.541	0.60(0.58)	0.97	3896.4	30700.00
7	1051.53	37.37	0.527	0.60(0.58)	0.97	4183.2	30600.00
8	1101.87	45.60	0.474	0.60(0.58)	0.97	5650.6	21300.00
9	1124.52	49.12	0.454	0.60(0.58)	0.97	6329.3	30410.00
10	1125.06	49.22	0.453	0.60(0.58)	0.97	6348.1	30520.00
11	1129.99	50.48	0.447	0.60(0.58)	0.97	6578.4	30210.00
12	1131.50	50.86	0.445	0.60(0.58)	0.97	6659.4	30200.00
13	1141.23	53.11	0.436	0.60(0.58)	0.97	7139.7	30540.00
14	1145.35	54.16	0.431	0.60(0.58)	0.97	7358.6	30100.00
15	1144.79	54.50	0.430	0.60(0.58)	0.97	7426.3	30510.00
16	1137.41	58.11	0.414	0.60(0.58)	0.97	8131.8	40510.00
17	1136.35	58.17	0.414	0.60(0.58)	0.96	8144.0	30110.00
18	1130.12	58.65	0.412	0.60(0.58)	0.96	8248.5	30500.00
19	1120.73	59.47	0.409	0.60(0.58)	0.96	8424.4	30400.00
20	1083.34	62.94	0.400	0.60(0.58)	0.96	9168.6	21200.00
21	1041.30	66.80	0.392	0.60(0.58)	0.96	9974.6	30300.00
22	987.43	71.63	0.381	0.60(0.57)	0.96	10950.3	21400.00
23	966.14	73.54	0.377	0.60(0.57)	0.96	11324.6	50100.00
24	871.45	98.06	0.330	0.60(0.57)	0.95	16302.4	13100.00
25	871.48	98.28	0.330	0.60(0.57)	0.95	16345.6	31400.00
26	873.09	99.47	0.328	0.60(0.57)	0.95	16583.9	13200.00
27	874.03	105.93	0.319	0.60(0.57)	0.95	17766.1	13210.00
28	876.69	109.77	0.313	0.60(0.57)	0.95	18449.0	40100.00
29	923.63	122.02	0.296	0.60(0.57)	0.95	20612.6	11831.00
30	996.79	137.04	0.284	0.60(0.57)	0.95	23559.0	13000.00
31	1008.58	140.51	0.281	0.60(0.57)	0.95	24137.7	13010.00
32	1023.88	144.98	0.277	0.60(0.57)	0.96	24856.2	11530.00
33	1095.06	164.24	0.261	0.60(0.58)	0.96	29013.0	11000.00
34	1191.12	186.30	0.246	0.60(0.58)	0.97	35804.0	10850.00
35	1110.77	202.12	0.240	0.60(0.58)	0.97	39151.7	11220.00
36	1049.70	213.64	0.236	0.60(0.58)	0.97	40906.9	10910.00
37	883.01	254.53	0.221	0.60(0.58)	0.97	47490.8	12410.00
38	833.89	287.55	0.209	0.60(0.58)	0.97	53569.1	12261.00
39	817.14	300.47	0.204	0.60(0.58)	0.98	55053.9	10410.00
40	800.86	312.67	0.199	0.60(0.59)	0.98	56159.7	12101.10
41	764.14	340.13	0.189	0.60(0.59)	0.98	58537.4	10200.00
42	745.54	353.55	0.184	0.60(0.59)	0.98	59477.1	12010.00
43	702.85	383.04	0.180	0.60(0.59)	0.98	60154.5	10210.00
44	642.79	432.43	0.175	0.60(0.59)	0.98	60656.2	12000.00
45	602.79	499.61	0.169	0.60(0.59)	0.98	61224.6	10100.00

TOTAL AREA(ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1191.12 Tc(MIN.) = 186.298
EFFECTIVE AREA(ACRES) = 35804.04 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 61224.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 61224.6 TC(MIN.) = 186.30
EFFECTIVE AREA(ACRES) = 35804.04 AREA-AVERAGED Fm(INCH/HR)= 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.968
PEAK FLOW RATE(CFS) = 1191.12

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1004.03	28.06	0.616	0.60(0.58)	0.97	2768.6	30900.00
2	1004.08	28.07	0.616	0.60(0.58)	0.97	2769.6	30910.00
3	1020.86	31.32	0.576	0.60(0.58)	0.97	3110.1	50400.00
4	1028.97	32.60	0.566	0.60(0.58)	0.97	3337.1	30800.00
5	1034.76	33.68	0.557	0.60(0.58)	0.97	3532.0	31000.00
6	1045.48	35.74	0.541	0.60(0.58)	0.97	3896.4	30700.00
7	1051.53	37.37	0.527	0.60(0.58)	0.97	4183.2	30600.00
8	1101.87	45.60	0.474	0.60(0.58)	0.97	5650.6	21300.00
9	1124.52	49.12	0.454	0.60(0.58)	0.97	6329.3	30410.00
10	1125.06	49.22	0.453	0.60(0.58)	0.97	6348.1	30520.00
11	1129.99	50.48	0.447	0.60(0.58)	0.97	6578.4	30210.00
12	1131.50	50.86	0.445	0.60(0.58)	0.97	6659.4	30200.00
13	1141.23	53.11	0.436	0.60(0.58)	0.97	7139.7	30540.00
14	1145.35	54.16	0.431	0.60(0.58)	0.97	7358.6	30100.00
15	1144.79	54.50	0.430	0.60(0.58)	0.97	7426.3	30510.00
16	1137.41	58.11	0.414	0.60(0.58)	0.97	8131.8	40510.00
17	1136.35	58.17	0.414	0.60(0.58)	0.96	8144.0	30110.00
18	1130.12	58.65	0.412	0.60(0.58)	0.96	8248.5	30500.00
19	1120.73	59.47	0.409	0.60(0.58)	0.96	8424.4	30400.00
20	1083.34	62.94	0.400	0.60(0.58)	0.96	9168.6	21200.00
21	1041.30	66.80	0.392	0.60(0.58)	0.96	9974.6	30300.00
22	987.43	71.63	0.381	0.60(0.57)	0.96	10950.3	21400.00
23	966.14	73.54	0.377	0.60(0.57)	0.96	11324.6	50100.00
24	871.45	98.06	0.330	0.60(0.57)	0.95	16302.4	13100.00
25	871.48	98.28	0.330	0.60(0.57)	0.95	16345.6	31400.00
26	873.09	99.47	0.328	0.60(0.57)	0.95	16583.9	13200.00
27	874.03	105.93	0.319	0.60(0.57)	0.95	17766.1	13210.00
28	876.69	109.77	0.313	0.60(0.57)	0.95	18449.0	40100.00
29	923.63	122.02	0.296	0.60(0.57)	0.95	20612.6	11831.00
30	996.79	137.04	0.284	0.60(0.57)	0.95	23559.0	13000.00
31	1008.58	140.51	0.281	0.60(0.57)	0.95	24137.7	13010.00
32	1023.88	144.98	0.277	0.60(0.57)	0.96	24856.2	11530.00
33	1095.06	164.24	0.261	0.60(0.58)	0.96	29013.0	11000.00
34	1191.12	186.30	0.246	0.60(0.58)	0.97	35804.0	10850.00
35	1110.77	202.12	0.240	0.60(0.58)	0.97	39151.7	11220.00
36	1049.70	213.64	0.236	0.60(0.58)	0.97	40906.9	10910.00
37	883.01	254.53	0.221	0.60(0.58)	0.97	47490.8	12410.00
38	833.89	287.55	0.209	0.60(0.58)	0.97	53569.1	12261.00
39	817.14	300.47	0.204	0.60(0.58)	0.98	55053.9	10410.00
40	800.86	312.67	0.199	0.60(0.59)	0.98	56159.7	12101.10
41	764.14	340.13	0.189	0.60(0.59)	0.98	58537.4	10200.00
42	745.54	353.55	0.184	0.60(0.59)	0.98	59477.1	12010.00
43	702.85	383.04	0.180	0.60(0.59)	0.98	60154.5	10210.00
44	642.79	432.43	0.175	0.60(0.59)	0.98	60656.2	12000.00
45	602.79	499.61	0.169	0.60(0.59)	0.98	61224.6	10100.00

==========

==========

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S34.DAT
  TIME/DATE OF STUDY: 08:01 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.820
   2)   10.00;  1.213
   3)   15.00;  0.930
   4)   20.00;  0.765
   5)   25.00;  0.661
   6)   30.00;  0.587
   7)   40.00;  0.505
   8)   50.00;  0.448
   9)   60.00;  0.406
  10)   90.00;  0.341
  11)  120.00;  0.297
  12)  180.00;  0.248
  13)  360.00;  0.181
  14) 1440.00;  0.079
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S33.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1     1004.08   28.07  0.60( 0.58) 0.97    2769.6   30910.00
      2     1145.35   54.16  0.60( 0.58) 0.97    7358.6   30100.00
      3      987.43   71.63  0.60( 0.57) 0.96   10950.3   21400.00
      4      873.09   99.47  0.60( 0.57) 0.95   16583.9   13200.00
      5      876.69  109.77  0.60( 0.57) 0.95   18449.0   40100.00
      6      923.63  122.02  0.60( 0.57) 0.95   20612.6   11831.00
      7     1023.88  144.98  0.60( 0.57) 0.96   24856.2   11530.00
      8     1095.06  164.24  0.60( 0.58) 0.96   29013.0   11000.00
      9     1191.12  186.30  0.60( 0.58) 0.97   35804.0   10850.00
     10     1110.77  202.12  0.60( 0.58) 0.97   39151.7   11220.00
     11     1049.70  213.64  0.60( 0.58) 0.97   40906.9   10910.00
     12      883.01  254.53  0.60( 0.58) 0.97   47490.8   12410.00
     13      833.89  287.55  0.60( 0.58) 0.97   53569.1   12261.00
     14      817.14  300.47  0.60( 0.58) 0.98   55053.9   10410.00
     15      800.86  312.67  0.60( 0.59) 0.98   56159.7   12101.10
     16      764.14  340.13  0.60( 0.59) 0.98   58537.4   10200.00
     17      745.54  353.55  0.60( 0.59) 0.98   59477.1   12010.00
     18      702.85  383.04  0.60( 0.59) 0.98   60154.5   10210.00
     19      642.79  432.43  0.60( 0.59) 0.98   60656.2   12000.00
     20      602.79  499.61  0.60( 0.59) 0.98   61224.6   10100.00
   TOTAL AREA(ACRES) =    61224.6

**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1     1004.08   28.07  0.60( 0.58) 0.97    2769.6   30910.00
      2     1145.35   54.16  0.60( 0.58) 0.97    7358.6   30100.00
      3      987.43   71.63  0.60( 0.57) 0.96   10950.3   21400.00
      4      873.09   99.47  0.60( 0.57) 0.95   16583.9   13200.00
      5      876.69  109.77  0.60( 0.57) 0.95   18449.0   40100.00
      6      923.63  122.02  0.60( 0.57) 0.95   20612.6   11831.00
      7     1023.88  144.98  0.60( 0.57) 0.96   24856.2   11530.00
      8     1095.06  164.24  0.60( 0.58) 0.96   29013.0   11000.00
      9     1191.12  186.30  0.60( 0.58) 0.97   35804.0   10850.00
     10     1110.77  202.12  0.60( 0.58) 0.97   39151.7   11220.00
     11     1049.70  213.64  0.60( 0.58) 0.97   40906.9   10910.00
     12      883.01  254.53  0.60( 0.58) 0.97   47490.8   12410.00
     13      833.89  287.55  0.60( 0.58) 0.97   53569.1   12261.00
     14      817.14  300.47  0.60( 0.58) 0.98   55053.9   10410.00
     15      800.86  312.67  0.60( 0.59) 0.98   56159.7   12101.10
     16      764.14  340.13  0.60( 0.59) 0.98   58537.4   10200.00
     17      745.54  353.55  0.60( 0.59) 0.98   59477.1   12010.00
     18      702.85  383.04  0.60( 0.59) 0.98   60154.5   10210.00
```

```
     19      642.79  432.43  0.60( 0.59) 0.98   60656.2   12000.00
     20      602.79  499.61  0.60( 0.59) 0.98   61224.6   10100.00
    TOTAL AREA(ACRES) =     61224.6

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13402.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    212.00  DOWNSTREAM(FEET) =    209.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   623.02   CHANNEL SLOPE =  0.0048
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1191.12
  FLOW VELOCITY(FEET/SEC.) =   7.76   FLOW DEPTH(FEET) =   7.15
  TRAVEL TIME(MIN.) =   1.34   Tc(MIN.) =  187.64
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610505T.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        7.45   28.69  0.60( 0.59) 0.99     153.2   50500.00
    TOTAL AREA(ACRES) =      153.2

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1004.08   29.47    0.595  0.60( 0.58) 0.97    2769.6   30910.00
      2     1145.35   55.51    0.425  0.60( 0.58) 0.97    7358.6   30100.00
      3      987.43   73.03    0.378  0.60( 0.57) 0.96   10950.3   21400.00
      4      873.09  100.91    0.325  0.60( 0.57) 0.95   16583.9   13200.00
      5      876.69  111.21    0.310  0.60( 0.57) 0.95   18449.0   40100.00
      6      923.63  123.45    0.294  0.60( 0.57) 0.95   20612.6   11831.00
      7     1023.88  146.36    0.275  0.60( 0.57) 0.96   24856.2   11530.00
      8     1095.06  165.61    0.260  0.60( 0.58) 0.96   29013.0   11000.00
      9     1191.12  187.64    0.245  0.60( 0.58) 0.97   35804.0   10850.00
     10     1110.77  203.48    0.239  0.60( 0.58) 0.97   39151.7   11220.00
     11     1049.70  215.02    0.235  0.60( 0.58) 0.97   40906.9   10910.00
     12      883.01  255.97    0.220  0.60( 0.58) 0.97   47490.8   12410.00
     13      833.89  289.01    0.207  0.60( 0.58) 0.97   53569.1   12261.00
     14      817.14  301.94    0.203  0.60( 0.58) 0.98   55053.9   10410.00
     15      800.86  314.14    0.198  0.60( 0.59) 0.98   56159.7   12101.10
     16      764.14  341.62    0.188  0.60( 0.59) 0.98   58537.4   10200.00
     17      745.54  355.05    0.183  0.60( 0.59) 0.98   59477.1   12010.00
     18      702.85  384.56    0.179  0.60( 0.59) 0.98   60154.5   10210.00
```



```
     19      642.79  433.99    0.174  0.60( 0.59) 0.98   60656.2   12000.00
     20      602.79  501.20    0.168  0.60( 0.59) 0.98   61224.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        7.45   28.69    0.606  0.60( 0.59) 0.99     153.2   50500.00
  LONGEST FLOWPATH FROM NODE  50500.00 TO NODE  13402.00 =    6247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1011.53   28.69    0.606  0.60( 0.58) 0.97    2849.8   50500.00
      2     1008.18   29.47    0.595  0.60( 0.58) 0.97    2922.8   30910.00
      3     1148.28   55.51    0.425  0.60( 0.58) 0.97    7511.8   30100.00
      4      990.04   73.03    0.378  0.60( 0.58) 0.96   11103.5   21400.00
      5      875.33  100.91    0.325  0.60( 0.57) 0.95   16737.1   13200.00
      6      878.83  111.21    0.310  0.60( 0.57) 0.95   18602.2   40100.00
      7      925.66  123.45    0.294  0.60( 0.57) 0.95   20765.7   11831.00
      8     1025.78  146.36    0.275  0.60( 0.57) 0.96   25009.4   11530.00
      9     1096.85  165.61    0.260  0.60( 0.58) 0.96   29166.1   11000.00
     10     1192.81  187.64    0.245  0.60( 0.58) 0.97   35957.2   10850.00
     11     1112.42  203.48    0.239  0.60( 0.58) 0.97   39304.9   11220.00
     12     1051.33  215.02    0.235  0.60( 0.58) 0.97   41060.1   10910.00
     13      884.52  255.97    0.220  0.60( 0.58) 0.97   47644.0   12410.00
     14      835.32  289.01    0.207  0.60( 0.58) 0.97   53722.3   12261.00
     15      818.54  301.94    0.203  0.60( 0.58) 0.98   55207.1   10410.00
     16      802.23  314.14    0.198  0.60( 0.59) 0.98   56312.8   12101.10
     17      765.44  341.62    0.188  0.60( 0.59) 0.98   58690.6   10200.00
     18      746.80  355.05    0.183  0.60( 0.59) 0.98   59630.3   12010.00
     19      704.08  384.56    0.179  0.60( 0.59) 0.98   60307.7   10210.00
     20      643.99  433.99    0.174  0.60( 0.59) 0.98   60809.4   12000.00
     21      603.95  501.20    0.168  0.60( 0.59) 0.98   61377.8   10100.00
    TOTAL AREA(ACRES) =     61377.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1192.81  Tc(MIN.) =  187.635
  EFFECTIVE AREA(ACRES) =  35957.22  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =    61377.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    209.00  DOWNSTREAM(FEET) =    207.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.35   CHANNEL SLOPE =  0.0051
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1192.81
  FLOW VELOCITY(FEET/SEC.) =   7.91   FLOW DEPTH(FEET) =   7.09
  TRAVEL TIME(MIN.) =   0.83   Tc(MIN.) =  188.47
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610506T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        7.14   22.42  0.60( 0.60) 1.00      49.6   50600.00
    TOTAL AREA(ACRES) =       49.6

****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1011.53   29.56    0.594  0.60( 0.58) 0.97    2849.8   50500.00
      2     1008.18   30.34    0.584  0.60( 0.58) 0.97    2922.8   30910.00
      3     1148.28   56.35    0.421  0.60( 0.58) 0.97    7511.8   30100.00
      4      990.04   73.90    0.376  0.60( 0.58) 0.96   11103.5   21400.00
      5      875.33  101.81    0.324  0.60( 0.57) 0.95   16737.1   13200.00
      6      878.83  112.11    0.309  0.60( 0.57) 0.95   18602.2   40100.00
      7      925.66  124.34    0.293  0.60( 0.57) 0.95   20765.7   11831.00
      8     1025.78  147.23    0.275  0.60( 0.57) 0.96   25009.4   11530.00
      9     1096.85  166.46    0.259  0.60( 0.58) 0.96   29166.1   11000.00
     10     1192.81  188.47    0.245  0.60( 0.58) 0.97   35957.2   10850.00
     11     1112.42  204.33    0.239  0.60( 0.58) 0.97   39304.9   11220.00
     12     1051.33  215.88    0.235  0.60( 0.58) 0.97   41060.1   10910.00
     13      884.52  256.87    0.219  0.60( 0.58) 0.97   47644.0   12410.00
     14      835.32  289.92    0.207  0.60( 0.58) 0.97   53722.3   12261.00
     15      818.54  302.85    0.202  0.60( 0.58) 0.98   55207.1   10410.00
     16      802.23  315.06    0.198  0.60( 0.59) 0.98   56312.8   12101.10
     17      765.44  342.55    0.187  0.60( 0.59) 0.98   58690.6   10200.00
     18      746.80  355.99    0.182  0.60( 0.59) 0.98   59630.3   12010.00
     19      704.08  385.51    0.179  0.60( 0.59) 0.98   60307.7   10210.00
     20      643.99  434.96    0.174  0.60( 0.59) 0.98   60809.4   12000.00
     21      603.95  502.19    0.168  0.60( 0.59) 0.98   61377.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        7.14   22.42    0.715  0.60( 0.60) 1.00      49.6   50600.00
  LONGEST FLOWPATH FROM NODE  50600.00 TO NODE  13404.00 =    4378.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1018.66   22.42    0.715  0.60( 0.58) 0.97    2211.7   50600.00
      2     1011.53   29.56    0.594  0.60( 0.58) 0.97    2899.4   50500.00
      3     1008.18   30.34    0.584  0.60( 0.58) 0.97    2972.4   30910.00
      4     1148.28   56.35    0.421  0.60( 0.58) 0.97    7561.4   30100.00
      5      990.04   73.90    0.376  0.60( 0.58) 0.96   11153.1   21400.00
```



```
      6      875.33  101.81    0.324  0.60( 0.57) 0.95   16786.7   13200.00
      7      878.83  112.11    0.309  0.60( 0.57) 0.95   18651.8   40100.00
      8      925.66  124.34    0.293  0.60( 0.57) 0.95   20815.3   11831.00
      9     1025.78  147.23    0.275  0.60( 0.57) 0.96   25059.0   11530.00
     10     1096.85  166.46    0.259  0.60( 0.58) 0.96   29215.7   11000.00
     11     1192.81  188.47    0.245  0.60( 0.58) 0.97   36006.8   10850.00
     12     1112.42  204.33    0.239  0.60( 0.58) 0.97   39354.4   11220.00
     13     1051.33  215.88    0.235  0.60( 0.58) 0.97   41109.7   10910.00
     14      884.52  256.87    0.219  0.60( 0.58) 0.97   47693.6   12410.00
     15      835.32  289.92    0.207  0.60( 0.58) 0.97   53771.9   12261.00
     16      818.54  302.85    0.202  0.60( 0.58) 0.98   55256.7   10410.00
     17      802.23  315.06    0.198  0.60( 0.59) 0.98   56362.4   12101.10
     18      765.44  342.55    0.187  0.60( 0.59) 0.98   58740.2   10200.00
     19      746.80  355.99    0.182  0.60( 0.59) 0.98   59679.9   12010.00
     20      704.08  385.51    0.179  0.60( 0.59) 0.98   60357.3   10210.00
     21      643.99  434.96    0.174  0.60( 0.59) 0.98   60859.0   12000.00
     22      603.95  502.19    0.168  0.60( 0.59) 0.98   61427.4   10100.00
    TOTAL AREA(ACRES) =     61427.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1192.81  Tc(MIN.) =  188.468
  EFFECTIVE AREA(ACRES) =  36006.81  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =    61427.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13406.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    207.00  DOWNSTREAM(FEET) =    195.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1601.97   CHANNEL SLOPE =  0.0075
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1192.81
  FLOW VELOCITY(FEET/SEC.) =   9.16   FLOW DEPTH(FEET) =   6.59
  TRAVEL TIME(MIN.) =   2.91   Tc(MIN.) =  191.38
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610211T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       23.25   16.01  0.60( 0.60) 1.00      87.0   21100.00
    TOTAL AREA(ACRES) =       87.0
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1018.66   25.45    0.654  0.60( 0.58) 0.97    2211.7   50600.00
      2     1011.53   32.59    0.566  0.60( 0.58) 0.97    2899.4   50500.00
      3     1008.18   33.37    0.559  0.60( 0.58) 0.97    2972.4   30910.00
      4     1148.28   59.29    0.409  0.60( 0.58) 0.97    7561.4   30100.00
      5      990.04   76.96    0.369  0.60( 0.58) 0.96   11153.1   21400.00
      6      875.33  104.96    0.319  0.60( 0.57) 0.95   16786.7   13200.00
      7      878.83  115.26    0.304  0.60( 0.57) 0.95   18651.8   40100.00
      8      925.66  127.45    0.291  0.60( 0.57) 0.95   20815.3   11831.00
      9     1025.78  150.25    0.272  0.60( 0.57) 0.96   25059.0   11530.00
     10     1096.85  169.43    0.257  0.60( 0.58) 0.96   29215.7   11000.00
     11     1192.81  191.38    0.244  0.60( 0.58) 0.97   36006.8   10850.00
     12     1112.42  207.30    0.238  0.60( 0.58) 0.97   39354.4   11220.00
     13     1051.33  218.89    0.234  0.60( 0.58) 0.97   41109.7   10910.00
     14      884.52  260.01    0.218  0.60( 0.58) 0.97   47693.6   12410.00
     15      835.32  293.11    0.206  0.60( 0.58) 0.97   53771.9   12261.00
     16      818.54  306.05    0.201  0.60( 0.58) 0.98   55256.7   10410.00
     17      802.23  318.28    0.197  0.60( 0.59) 0.98   56362.4   12101.10
     18      765.44  345.81    0.186  0.60( 0.59) 0.98   58740.2   10200.00
     19      746.80  359.27    0.181  0.60( 0.59) 0.98   59679.9   12010.00
     20      704.08  388.84    0.178  0.60( 0.59) 0.98   60357.3   10210.00
     21      643.99  438.36    0.174  0.60( 0.59) 0.98   60859.0   12000.00
     22      603.95  505.64    0.167  0.60( 0.59) 0.98   61427.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       23.25   16.01    0.897  0.60( 0.60) 1.00      87.0   21100.00
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  13406.00 =    2859.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1041.91   16.01    0.897  0.60( 0.58) 0.97    1477.9   21100.00
      2     1022.92   25.45    0.654  0.60( 0.58) 0.97    2298.7   50600.00
      3     1011.53   32.59    0.566  0.60( 0.58) 0.97    2986.4   50500.00
      4     1008.18   33.37    0.559  0.60( 0.58) 0.97    3059.4   30910.00
      5     1148.28   59.29    0.409  0.60( 0.58) 0.97    7648.4   30100.00
      6      990.04   76.96    0.369  0.60( 0.58) 0.96   11240.1   21400.00
      7      875.33  104.96    0.319  0.60( 0.57) 0.95   16873.7   13200.00
      8      878.83  115.26    0.304  0.60( 0.57) 0.95   18738.8   40100.00
      9      925.66  127.45    0.291  0.60( 0.57) 0.95   20902.3   11831.00
     10     1025.78  150.25    0.272  0.60( 0.57) 0.96   25146.0   11530.00
     11     1096.85  169.43    0.257  0.60( 0.58) 0.96   29302.7   11000.00
     12     1192.81  191.38    0.244  0.60( 0.58) 0.97   36093.8   10850.00
     13     1112.42  207.30    0.238  0.60( 0.58) 0.97   39441.4   11220.00
     14     1051.33  218.89    0.234  0.60( 0.58) 0.97   41196.7   10910.00
     15      884.52  260.01    0.218  0.60( 0.58) 0.97   47780.6   12410.00
```



```
     16      835.32  293.11    0.206  0.60( 0.58) 0.97   53858.9   12261.00
     17      818.54  306.05    0.201  0.60( 0.58) 0.98   55343.7   10410.00
     18      802.23  318.28    0.197  0.60( 0.59) 0.98   56449.4   12101.10
     19      765.44  345.81    0.186  0.60( 0.59) 0.98   58827.2   10200.00
     20      746.80  359.27    0.181  0.60( 0.59) 0.98   59766.9   12010.00
     21      704.08  388.84    0.178  0.60( 0.59) 0.98   60444.3   10210.00
     22      643.99  438.36    0.174  0.60( 0.59) 0.98   60946.0   12000.00
     23      603.95  505.64    0.167  0.60( 0.59) 0.98   61514.4   10100.00
   TOTAL AREA(ACRES) =     61514.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1192.81  Tc(MIN.) =  191.382
  EFFECTIVE AREA(ACRES) =  36093.82  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =    61514.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13408.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    195.00  DOWNSTREAM(FEET) =    182.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2458.36   CHANNEL SLOPE =  0.0053
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.242
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       12.41      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1192.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.04
  AVERAGE FLOW DEPTH(FEET) =   7.03   TRAVEL TIME(MIN.) =   5.09
  Tc(MIN.) =  196.48
  SUBAREA AREA(ACRES) =    12.41       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  36106.23     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    61526.8         PEAK FLOW RATE(CFS) =    1192.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.03   FLOW VELOCITY(FEET/SEC.) =   8.04
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610507T.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       10.23   29.92  0.60( 0.60) 0.99     236.8   50700.00
    TOTAL AREA(ACRES) =      236.8

****************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1041.91   21.28    0.738  0.60( 0.58) 0.98    1490.3   21100.00
      2     1022.92   30.75    0.581  0.60( 0.58) 0.97    2311.1   50600.00
      3     1011.53   37.90    0.522  0.60( 0.58) 0.97    2998.8   50500.00
      4     1008.18   38.69    0.516  0.60( 0.58) 0.97    3071.8   30910.00
      5     1148.28   64.44    0.396  0.60( 0.58) 0.97    7660.8   30100.00
      6      990.04   82.30    0.358  0.60( 0.58) 0.96   11252.5   21400.00
      7      875.33  110.46    0.311  0.60( 0.57) 0.95   16886.1   13200.00
      8      878.83  120.75    0.296  0.60( 0.57) 0.95   18751.2   40100.00
      9      925.66  132.88    0.286  0.60( 0.57) 0.95   20914.7   11831.00
     10     1025.78  155.54    0.268  0.60( 0.57) 0.96   25158.4   11530.00
     11     1096.85  174.64    0.252  0.60( 0.58) 0.96   29315.1   11000.00
     12     1192.81  196.48    0.242  0.60( 0.58) 0.97   36106.2   10850.00
     13     1112.42  212.48    0.236  0.60( 0.58) 0.97   39453.9   11220.00
     14     1051.33  224.15    0.232  0.60( 0.58) 0.97   41209.1   10910.00
     15      884.52  265.50    0.216  0.60( 0.58) 0.97   47793.0   12410.00
     16      835.32  298.68    0.204  0.60( 0.58) 0.97   53871.3   12261.00
     17      818.54  311.65    0.199  0.60( 0.58) 0.98   55356.1   10410.00
     18      802.23  323.91    0.194  0.60( 0.59) 0.98   56461.9   12101.10
     19      765.44  351.50    0.184  0.60( 0.59) 0.98   58839.6   10200.00
     20      746.80  365.00    0.181  0.60( 0.59) 0.98   59779.3   12010.00
     21      704.08  394.65    0.178  0.60( 0.59) 0.98   60456.7   10210.00
     22      643.99  444.31    0.173  0.60( 0.59) 0.98   60958.4   12000.00
     23      603.95  511.69    0.167  0.60( 0.59) 0.98   61526.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.23   29.92    0.588  0.60( 0.60) 0.99     236.8   50700.00
  LONGEST FLOWPATH FROM NODE  50700.00 TO NODE  13408.00 =    7903.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1051.05   21.28    0.738  0.60( 0.59) 0.98    1658.7   21100.00
      2     1034.82   29.92    0.588  0.60( 0.59) 0.98    2475.8   50700.00
      3     1033.03   30.75    0.581  0.60( 0.59) 0.98    2547.9   50600.00
```



```
      4     1020.61   37.90    0.522  0.60( 0.58) 0.98    3235.6   50500.00
      5     1017.15   38.69    0.516  0.60( 0.58) 0.98    3308.6   30910.00
      6     1155.18   64.44    0.396  0.60( 0.58) 0.97    7897.6   30100.00
      7      996.26   82.30    0.358  0.60( 0.58) 0.96   11489.3   21400.00
      8      880.74  110.46    0.311  0.60( 0.57) 0.95   17122.9   13200.00
      9      883.98  120.75    0.296  0.60( 0.57) 0.95   18988.0   40100.00
     10      930.65  132.88    0.286  0.60( 0.57) 0.95   21151.5   11831.00
     11     1030.44  155.54    0.268  0.60( 0.57) 0.96   25395.2   11530.00
     12     1101.24  174.64    0.252  0.60( 0.58) 0.96   29551.9   11000.00
     13     1197.02  196.48    0.242  0.60( 0.58) 0.97   36343.0   10850.00
     14     1116.53  212.48    0.236  0.60( 0.58) 0.97   39690.6   11220.00
     15     1055.35  224.15    0.232  0.60( 0.58) 0.97   41445.9   10910.00
     16      888.28  265.50    0.216  0.60( 0.58) 0.97   48029.8   12410.00
     17      838.86  298.68    0.204  0.60( 0.58) 0.97   54108.1   12261.00
     18      822.00  311.65    0.199  0.60( 0.58) 0.98   55592.9   10410.00
     19      805.61  323.91    0.194  0.60( 0.59) 0.98   56698.6   12101.10
     20      768.64  351.50    0.184  0.60( 0.59) 0.98   59076.4   10200.00
     21      749.94  365.00    0.181  0.60( 0.59) 0.98   60016.1   12010.00
     22      707.17  394.65    0.178  0.60( 0.59) 0.98   60693.5   10210.00
     23      647.00  444.31    0.173  0.60( 0.59) 0.98   61195.2   12000.00
     24      606.85  511.69    0.167  0.60( 0.59) 0.98   61763.6   10100.00
   TOTAL AREA(ACRES) =     61763.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1197.02  Tc(MIN.) =  196.477
  EFFECTIVE AREA(ACRES) =  36343.01  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =    61763.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13410.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    182.00  DOWNSTREAM(FEET) =    178.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =   952.73   CHANNEL SLOPE =  0.0034
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.241
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.31      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1197.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.85
  AVERAGE FLOW DEPTH(FEET) =   7.63   TRAVEL TIME(MIN.) =   2.32
  Tc(MIN.) =  198.79
  SUBAREA AREA(ACRES) =     3.31       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =  36346.32     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
```

```
  TOTAL AREA(ACRES) =    61766.9         PEAK FLOW RATE(CFS) =    1197.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.63   FLOW VELOCITY(FEET/SEC.) =   6.85
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13410.00 =  124122.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13410.00 TO NODE  13410.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13410.00 TO NODE  13410.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S36.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      152.74   29.17  0.60( 0.59) 0.99     917.5   21000.00
      2      145.43   34.81  0.60( 0.59) 0.99    1123.9   20810.00
      3      145.07   35.39  0.60( 0.59) 0.99    1149.5   20900.00
      4      136.63   40.84  0.60( 0.59) 0.99    1369.8   20800.00
      5      123.62   46.22  0.60( 0.59) 0.99    1556.4   20700.00
      6      121.84   60.29  0.60( 0.59) 0.99    2104.0   20600.00
      7      131.52   69.35  0.60( 0.59) 0.99    2441.9   20500.00
      8      128.95   74.11  0.60( 0.59) 0.99    2550.9   20400.00
      9      122.55   75.61  0.60( 0.59) 0.99    2563.7   20300.00
     10      100.23   82.99  0.60( 0.59) 0.99    2627.4   20200.00
     11       98.19   83.76  0.60( 0.59) 0.99    2634.2   20210.00
     12       91.93   87.59  0.60( 0.59) 0.99    2679.2   20100.00
     13       83.89   95.10  0.60( 0.59) 0.99    2768.4   13600.00
     14       32.34  221.10  0.60( 0.58) 0.97    4029.4   13510.00
     15       32.60  230.37  0.60( 0.58) 0.97    4067.7   13500.00
    TOTAL AREA(ACRES) =     4067.7

****************************************************************************
  FLOW PROCESS FROM NODE  13410.00 TO NODE  13410.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1051.05   23.67    0.689  0.60( 0.59) 0.98    1662.0   21100.00
      2     1034.82   32.33    0.568  0.60( 0.59) 0.98    2479.1   50700.00
      3     1033.03   33.16    0.561  0.60( 0.59) 0.98    2551.2   50600.00
      4     1020.61   40.32    0.503  0.60( 0.58) 0.98    3238.9   50500.00
      5     1017.15   41.10    0.499  0.60( 0.58) 0.98    3311.9   30910.00
      6     1155.18   66.77    0.391  0.60( 0.58) 0.97    7900.9   30100.00
      7      996.26   84.72    0.352  0.60( 0.58) 0.96   11492.6   21400.00
      8      880.74  112.97    0.307  0.60( 0.57) 0.95   17126.2   13200.00
      9      883.98  123.25    0.294  0.60( 0.57) 0.95   18991.3   40100.00
     10      930.65  135.35    0.284  0.60( 0.57) 0.95   21154.8   11831.00
```



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     11     1030.44  157.95    0.266  0.60( 0.57) 0.96   25398.5   11530.00
     12     1101.24  177.01    0.250  0.60( 0.58) 0.96   29555.2   11000.00
     13     1197.02  198.79    0.241  0.60( 0.58) 0.97   36346.3   10850.00
     14     1116.53  214.84    0.235  0.60( 0.58) 0.97   39694.0   11220.00
     15     1055.35  226.55    0.231  0.60( 0.58) 0.97   41449.2   10910.00
     16      888.28  267.99    0.215  0.60( 0.58) 0.97   48033.1   12410.00
     17      838.86  301.21    0.203  0.60( 0.58) 0.97   54111.4   12261.00
     18      822.00  314.20    0.198  0.60( 0.58) 0.98   55596.2   10410.00
     19      805.61  326.47    0.193  0.60( 0.59) 0.98   56701.9   12101.10
     20      768.64  354.09    0.183  0.60( 0.59) 0.98   59079.7   10200.00
     21      749.94  367.60    0.180  0.60( 0.59) 0.98   60019.4   12010.00
     22      707.17  397.30    0.177  0.60( 0.59) 0.98   60696.8   10210.00
     23      647.00  447.01    0.173  0.60( 0.59) 0.98   61198.5   12000.00
     24      606.85  514.43    0.166  0.60( 0.59) 0.98   61766.9   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13410.00 =  124122.09 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      152.74   29.17    0.599  0.60( 0.59) 0.99     917.5   21000.00
    2      145.43   34.81    0.548  0.60( 0.59) 0.99    1123.9   20810.00
    3      145.07   35.39    0.543  0.60( 0.59) 0.99    1149.5   20900.00
    4      136.63   40.84    0.500  0.60( 0.59) 0.99    1369.8   20800.00
    5      123.62   46.22    0.470  0.60( 0.59) 0.99    1556.4   20700.00
    6      121.84   60.29    0.405  0.60( 0.59) 0.99    2104.0   20600.00
    7      131.52   69.35    0.386  0.60( 0.59) 0.99    2441.9   20500.00
    8      128.95   74.11    0.375  0.60( 0.59) 0.99    2550.9   20400.00
    9      122.55   75.61    0.372  0.60( 0.59) 0.99    2563.7   20300.00
   10      100.23   82.99    0.356  0.60( 0.59) 0.99    2627.4   20200.00
   11       98.19   83.76    0.355  0.60( 0.59) 0.99    2634.2   20210.00
   12       91.93   87.59    0.346  0.60( 0.59) 0.99    2679.2   20100.00
   13       83.89   95.10    0.334  0.60( 0.59) 0.99    2768.4   13600.00
   14       32.34  221.10    0.233  0.60( 0.58) 0.97    4029.4   13510.00
   15       32.60  230.37    0.229  0.60( 0.58) 0.97    4067.7   13500.00
LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13410.00 =   40827.58 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1193.49   23.67    0.689  0.60( 0.59) 0.98    2406.8   21100.00
    2     1193.49   29.17    0.599  0.60( 0.59) 0.98    3098.3   21000.00
    3     1183.47   32.33    0.568  0.60( 0.59) 0.98    3512.1   50700.00
    4     1180.60   33.16    0.561  0.60( 0.59) 0.98    3614.6   50600.00
    5     1175.59   34.81    0.548  0.60( 0.59) 0.98    3833.9   20810.00
    6     1174.22   35.39    0.543  0.60( 0.59) 0.98    3915.4   20900.00
    7     1158.06   40.32    0.503  0.60( 0.59) 0.98    4587.3   50500.00
    8     1154.91   40.84    0.500  0.60( 0.59) 0.98    4658.0   20800.00
    9     1153.16   41.10    0.499  0.60( 0.59) 0.98    4690.6   30910.00
   10     1168.28   46.22    0.470  0.60( 0.59) 0.98    5782.7   20700.00
   11     1242.14   60.29    0.405  0.60( 0.58) 0.98    8845.4   20600.00
   12     1283.94   66.77    0.391  0.60( 0.58) 0.97   10246.7   30100.00
   13     1263.85   69.35    0.386  0.60( 0.58) 0.97   10859.3   20500.00
   14     1219.15   74.11    0.375  0.60( 0.58) 0.97   11920.3   20400.00
   15     1199.45   75.61    0.372  0.60( 0.58) 0.97   12233.9   20300.00
   16     1111.84   82.99    0.356  0.60( 0.58) 0.97   13773.0   20200.00
   17     1102.93   83.76    0.355  0.60( 0.58) 0.97   13935.2   20210.00
   18     1092.88   84.72    0.352  0.60( 0.58) 0.97   14138.1   21400.00
   19     1076.47   87.59    0.346  0.60( 0.58) 0.97   14743.6   20100.00
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     20     1037.69   95.10    0.334  0.60( 0.58) 0.96   16331.9   13600.00
     21      957.33  112.97    0.307  0.60( 0.57) 0.96   20073.3   13200.00
     22      956.36  123.25    0.294  0.60( 0.57) 0.96   22041.4   40100.00
     23      998.07  135.35    0.284  0.60( 0.57) 0.96   24326.0   11831.00
     24     1088.62  157.95    0.266  0.60( 0.58) 0.96   28795.9   11530.00
     25     1151.62  177.01    0.250  0.60( 0.58) 0.96   33143.4   11000.00
     26     1238.48  198.79    0.241  0.60( 0.58) 0.97   40152.5   10850.00
     27     1151.42  214.84    0.235  0.60( 0.58) 0.97   43660.8   11220.00
     28     1116.17  221.10    0.233  0.60( 0.58) 0.97   44661.4   13510.00
     29     1087.85  226.55    0.231  0.60( 0.58) 0.97   45501.1   10910.00
     30     1072.55  230.37    0.229  0.60( 0.58) 0.97   46124.1   13500.00
     31      918.90  267.99    0.215  0.60( 0.58) 0.97   52100.9   12410.00
     32      867.71  301.21    0.203  0.60( 0.58) 0.97   58179.2   12261.00
     33      850.16  314.20    0.198  0.60( 0.58) 0.98   59663.9   10410.00
     34      833.13  326.47    0.193  0.60( 0.59) 0.98   60769.7   12101.10
     35      794.70  354.09    0.183  0.60( 0.59) 0.98   63147.5   10200.00
     36      775.58  367.60    0.180  0.60( 0.59) 0.98   64087.1   12010.00
     37      732.41  397.30    0.177  0.60( 0.59) 0.98   64764.5   10210.00
     38      671.57  447.01    0.173  0.60( 0.59) 0.98   65266.3   12000.00
     39      630.52  514.43    0.166  0.60( 0.59) 0.98   65834.6   10100.00
   TOTAL AREA(ACRES) =     65834.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1283.94  Tc(MIN.) =   66.773
  EFFECTIVE AREA(ACRES) =  10246.66  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =    65834.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13410.00 =  124122.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13410.00 TO NODE  13412.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    178.72  DOWNSTREAM(FEET) =    176.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   169.78   CHANNEL SLOPE =  0.0105
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1283.94
  FLOW VELOCITY(FEET/SEC.) =  10.61   FLOW DEPTH(FEET) =   6.35
  TRAVEL TIME(MIN.) =   0.27   Tc(MIN.) =   67.04
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13412.00 =  124291.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13412.00 TO NODE  13412.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13412.00 TO NODE  13412.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509101T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1         9.27   73.72  0.60( 0.60) 1.00     585.7   10100.00
   TOTAL AREA(ACRES) =      585.7

****************************************************************************
  FLOW PROCESS FROM NODE  13412.00 TO NODE  13412.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     1193.49   23.94    0.683  0.60( 0.59) 0.98    2406.8   21100.00
      2     1193.49   29.44    0.595  0.60( 0.59) 0.98    3098.3   21000.00
      3     1183.47   32.60    0.566  0.60( 0.59) 0.98    3512.1   50700.00
      4     1180.60   33.43    0.559  0.60( 0.59) 0.98    3614.6   50600.00
      5     1175.59   35.08    0.545  0.60( 0.59) 0.98    3833.9   20810.00
      6     1174.22   35.66    0.541  0.60( 0.59) 0.98    3915.4   20900.00
      7     1158.06   40.59    0.502  0.60( 0.59) 0.98    4587.3   50500.00
      8     1154.91   41.12    0.499  0.60( 0.59) 0.98    4658.0   20800.00
      9     1153.16   41.37    0.497  0.60( 0.59) 0.98    4690.6   30910.00
     10     1168.28   46.49    0.468  0.60( 0.59) 0.98    5782.7   20700.00
     11     1242.14   60.56    0.405  0.60( 0.58) 0.98    8845.4   20600.00
     12     1283.94   67.04    0.391  0.60( 0.58) 0.97   10246.7   30100.00
     13     1263.85   69.62    0.385  0.60( 0.58) 0.97   10859.3   20500.00
     14     1219.15   74.38    0.375  0.60( 0.58) 0.97   11920.3   20400.00
     15     1199.45   75.89    0.372  0.60( 0.58) 0.97   12233.9   20300.00
     16     1111.84   83.26    0.356  0.60( 0.58) 0.97   13773.0   20200.00
     17     1102.93   84.04    0.354  0.60( 0.58) 0.97   13935.2   20210.00
     18     1092.88   85.00    0.352  0.60( 0.58) 0.97   14138.1   21400.00
     19     1076.47   87.87    0.346  0.60( 0.58) 0.97   14743.6   20100.00
     20     1037.69   95.39    0.333  0.60( 0.58) 0.96   16331.9   13600.00
     21      957.33  113.25    0.307  0.60( 0.57) 0.96   20073.3   13200.00
     22      956.36  123.54    0.294  0.60( 0.57) 0.96   22041.4   40100.00
     23      998.07  135.63    0.284  0.60( 0.57) 0.96   24326.0   11831.00
     24     1088.62  158.22    0.266  0.60( 0.58) 0.96   28795.9   11530.00
     25     1151.62  177.28    0.250  0.60( 0.58) 0.96   33143.4   11000.00
     26     1238.48  199.06    0.241  0.60( 0.58) 0.97   40152.5   10850.00
     27     1151.42  215.11    0.235  0.60( 0.58) 0.97   43660.8   11220.00
     28     1116.17  221.37    0.233  0.60( 0.58) 0.97   44661.4   13510.00
     29     1087.85  226.83    0.231  0.60( 0.58) 0.97   45501.1   10910.00
     30     1072.55  230.65    0.229  0.60( 0.58) 0.97   46124.1   13500.00
     31      918.90  268.28    0.215  0.60( 0.58) 0.97   52100.9   12410.00
     32      867.71  301.51    0.203  0.60( 0.58) 0.97   58179.2   12261.00
     33      850.16  314.49    0.198  0.60( 0.58) 0.98   59663.9   10410.00
     34      833.13  326.77    0.193  0.60( 0.59) 0.98   60769.7   12101.10
     35      794.70  354.39    0.183  0.60( 0.59) 0.98   63147.5   10200.00
     36      775.58  367.90    0.180  0.60( 0.59) 0.98   64087.1   12010.00
     37      732.41  397.60    0.177  0.60( 0.59) 0.98   64764.5   10210.00
     38      671.57  447.32    0.173  0.60( 0.59) 0.98   65266.3   12000.00
     39      630.52  514.75    0.166  0.60( 0.59) 0.98   65834.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13412.00 =  124291.87 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1         9.27   73.72    0.376  0.60( 0.60) 1.00     585.7   10100.00
```

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 14724.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1198.95	23.94	0.683	0.60(0.59)	0.98	2597.0	21100.00
2	1199.35	29.44	0.595	0.60(0.59)	0.98	3332.1	21000.00
3	1189.64	32.60	0.566	0.60(0.59)	0.98	3771.1	50700.00
4	1186.85	33.43	0.559	0.60(0.59)	0.98	3880.3	50600.00
5	1181.99	35.08	0.545	0.60(0.59)	0.98	4112.6	20810.00
6	1180.67	35.66	0.541	0.60(0.59)	0.98	4198.7	20900.00
7	1164.86	40.59	0.502	0.60(0.59)	0.98	4909.8	50500.00
8	1161.76	41.12	0.499	0.60(0.59)	0.98	4984.7	20800.00
9	1160.04	41.37	0.497	0.60(0.59)	0.98	5019.3	30910.00
10	1175.55	46.49	0.468	0.60(0.59)	0.98	6152.0	20700.00
11	1250.34	60.56	0.405	0.60(0.59)	0.98	9326.5	20600.00
12	1292.70	67.04	0.391	0.60(0.58)	0.98	10779.3	30100.00
13	1272.82	69.62	0.385	0.60(0.58)	0.97	11412.4	20500.00
14	1234.64	73.72	0.376	0.60(0.58)	0.97	12358.7	10100.00
15	1228.39	74.38	0.375	0.60(0.58)	0.97	12506.0	20400.00
16	1208.61	75.89	0.372	0.60(0.58)	0.97	12819.6	20300.00
17	1120.61	83.26	0.356	0.60(0.58)	0.97	14358.7	20200.00
18	1111.65	84.04	0.354	0.60(0.58)	0.97	14520.9	20210.00
19	1101.55	85.00	0.352	0.60(0.58)	0.97	14723.8	21400.00
20	1084.99	87.87	0.346	0.60(0.58)	0.97	15329.3	20100.00
21	1045.90	95.39	0.333	0.60(0.58)	0.96	16917.6	13600.00
22	964.89	113.25	0.307	0.60(0.58)	0.96	20659.1	13200.00
23	963.61	123.54	0.294	0.60(0.58)	0.96	22627.1	40100.00
24	1005.08	135.63	0.284	0.60(0.58)	0.96	24911.7	11831.00
25	1095.17	158.22	0.266	0.60(0.58)	0.96	29381.6	11530.00
26	1157.79	177.28	0.250	0.60(0.58)	0.96	33729.1	11000.00
27	1244.42	199.06	0.241	0.60(0.58)	0.97	40738.3	10850.00
28	1157.22	215.11	0.235	0.60(0.58)	0.97	44246.5	11220.00
29	1121.91	221.37	0.233	0.60(0.58)	0.97	45247.1	13510.00
30	1093.53	226.83	0.231	0.60(0.58)	0.97	46086.9	10910.00
31	1078.20	230.65	0.229	0.60(0.58)	0.97	46709.8	13500.00
32	924.20	268.28	0.215	0.60(0.58)	0.97	52686.6	12410.00
33	872.71	301.51	0.203	0.60(0.58)	0.97	58764.9	12261.00
34	855.04	314.49	0.198	0.60(0.58)	0.98	60249.6	10410.00
35	837.89	326.77	0.193	0.60(0.59)	0.98	61355.4	12101.10
36	799.21	354.39	0.183	0.60(0.59)	0.98	63733.2	10200.00
37	780.02	367.90	0.180	0.60(0.59)	0.98	64672.9	12010.00
38	736.78	397.60	0.177	0.60(0.59)	0.98	65350.3	10210.00
39	675.83	447.32	0.173	0.60(0.59)	0.98	65852.0	12000.00
40	634.62	514.75	0.166	0.60(0.59)	0.98	66420.4	10100.00

TOTAL AREA(ACRES) = 66420.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1292.70 Tc(MIN.) = 67.040
EFFECTIVE AREA(ACRES) = 10779.31 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 66420.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13700.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 176.93 DOWNSTREAM(FEET) = 173.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 260.10 CHANNEL SLOPE = 0.0151
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 1292.70
FLOW VELOCITY(FEET/SEC.) = 12.16 FLOW DEPTH(FEET) = 5.95
TRAVEL TIME(MIN.) = 0.36 Tc(MIN.) = 67.40
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

****
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610508T.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.79	30.21	0.60(0.59)	0.99	131.3	50800.00

TOTAL AREA(ACRES) = 131.3

****
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1198.95	24.31	0.675	0.60(0.59)	0.98	2597.0	21100.00
2	1199.35	29.80	0.590	0.60(0.59)	0.98	3332.1	21000.00
3	1189.64	32.96	0.563	0.60(0.59)	0.98	3771.1	50700.00
4	1186.85	33.79	0.556	0.60(0.59)	0.98	3880.3	50600.00
5	1181.99	35.45	0.542	0.60(0.59)	0.98	4112.6	20810.00
6	1180.67	36.03	0.538	0.60(0.59)	0.98	4198.7	20900.00
7	1164.86	40.95	0.500	0.60(0.59)	0.98	4909.8	50500.00
8	1161.76	41.49	0.497	0.60(0.59)	0.98	4984.7	20800.00
9	1160.04	41.74	0.495	0.60(0.59)	0.98	5019.3	30910.00
10	1175.55	46.85	0.466	0.60(0.59)	0.98	6152.0	20700.00
11	1250.34	60.91	0.404	0.60(0.59)	0.98	9326.5	20600.00
12	1292.70	67.40	0.390	0.60(0.58)	0.98	10779.3	30100.00
13	1272.82	69.98	0.384	0.60(0.58)	0.97	11412.4	20500.00
14	1234.64	74.08	0.375	0.60(0.58)	0.97	12358.7	10100.00
15	1228.39	74.74	0.374	0.60(0.58)	0.97	12506.0	20400.00
16	1208.61	76.25	0.371	0.60(0.58)	0.97	12819.6	20300.00
17	1120.61	83.63	0.355	0.60(0.58)	0.97	14358.7	20200.00
18	1111.65	84.41	0.353	0.60(0.58)	0.97	14520.9	20210.00
19	1101.55	85.37	0.351	0.60(0.58)	0.97	14723.8	21400.00
20	1084.99	88.24	0.345	0.60(0.58)	0.97	15329.3	20100.00

21	1045.90	95.76	0.333	0.60(0.58)	0.96	16917.6	13600.00
22	964.89	113.64	0.306	0.60(0.58)	0.96	20659.1	13200.00
23	963.61	123.92	0.294	0.60(0.58)	0.96	22627.1	40100.00
24	1005.08	136.01	0.284	0.60(0.58)	0.96	24911.7	11831.00
25	1095.17	158.60	0.265	0.60(0.58)	0.96	29381.6	11530.00
26	1157.79	177.65	0.250	0.60(0.58)	0.96	33729.1	11000.00
27	1244.42	199.42	0.241	0.60(0.58)	0.97	40738.3	10850.00
28	1157.22	215.48	0.235	0.60(0.58)	0.97	44246.5	11220.00
29	1121.91	221.74	0.232	0.60(0.58)	0.97	45247.1	13510.00
30	1093.53	227.20	0.230	0.60(0.58)	0.97	46086.9	10910.00
31	1078.20	231.02	0.229	0.60(0.58)	0.97	46709.8	13500.00
32	924.20	268.67	0.215	0.60(0.58)	0.97	52686.6	12410.00
33	872.71	301.90	0.203	0.60(0.58)	0.97	58764.9	12261.00
34	855.04	314.89	0.198	0.60(0.58)	0.98	60249.6	10410.00
35	837.89	327.16	0.193	0.60(0.59)	0.98	61355.4	12101.10
36	799.21	354.80	0.183	0.60(0.59)	0.98	63733.2	10200.00
37	780.02	368.31	0.180	0.60(0.59)	0.98	64672.9	12010.00
38	736.78	398.01	0.177	0.60(0.59)	0.98	65350.3	10210.00
39	675.83	447.74	0.173	0.60(0.59)	0.98	65852.0	12000.00
40	634.62	515.18	0.166	0.60(0.59)	0.98	66420.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.79	30.21	0.585	0.60(0.59)	0.99	131.3	50800.00

LONGEST FLOWPATH FROM NODE 50800.00 TO NODE 13700.00 = 5946.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1204.33	24.31	0.675	0.60(0.59)	0.98	2702.6	21100.00
2	1205.11	29.80	0.590	0.60(0.59)	0.98	3461.7	21000.00
3	1203.90	30.21	0.585	0.60(0.59)	0.98	3519.7	50800.00
4	1195.21	32.96	0.563	0.60(0.59)	0.98	3902.4	50700.00
5	1192.35	33.79	0.556	0.60(0.59)	0.98	4011.5	50600.00
6	1187.35	35.45	0.542	0.60(0.59)	0.98	4243.9	20810.00
7	1185.98	36.03	0.538	0.60(0.59)	0.98	4330.0	20900.00
8	1169.81	40.95	0.500	0.60(0.59)	0.98	5041.1	50500.00
9	1166.67	41.49	0.497	0.60(0.59)	0.98	5115.9	20800.00
10	1164.94	41.74	0.495	0.60(0.59)	0.98	5150.6	30910.00
11	1180.16	46.85	0.466	0.60(0.59)	0.98	6283.3	20700.00
12	1254.34	60.91	0.404	0.60(0.59)	0.98	9457.8	20600.00
13	1296.56	67.40	0.390	0.60(0.58)	0.98	10910.6	30100.00
14	1276.62	69.98	0.384	0.60(0.58)	0.97	11543.7	20500.00
15	1238.35	74.08	0.375	0.60(0.58)	0.97	12489.9	10100.00
16	1232.09	74.74	0.374	0.60(0.58)	0.97	12637.3	20400.00
17	1212.28	76.25	0.371	0.60(0.58)	0.97	12950.9	20300.00
18	1124.12	83.63	0.355	0.60(0.58)	0.97	14490.0	20200.00
19	1115.15	84.41	0.353	0.60(0.58)	0.97	14652.2	20210.00
20	1105.03	85.37	0.351	0.60(0.58)	0.97	14855.1	21400.00
21	1088.40	88.24	0.345	0.60(0.58)	0.97	15460.6	20100.00
22	1049.19	95.76	0.333	0.60(0.58)	0.96	17048.8	13600.00
23	967.92	113.64	0.306	0.60(0.58)	0.96	20790.3	13200.00
24	966.52	123.92	0.294	0.60(0.58)	0.96	22758.4	40100.00
25	1007.89	136.01	0.284	0.60(0.58)	0.96	25043.0	11831.00
26	1097.80	158.60	0.265	0.60(0.58)	0.96	29512.9	11530.00
27	1160.26	177.65	0.250	0.60(0.58)	0.96	33860.4	11000.00

28	1246.80	199.42	0.241	0.60(0.58)	0.97	40869.5	10850.00
29	1159.54	215.48	0.235	0.60(0.58)	0.97	44377.8	11220.00
30	1124.21	221.74	0.232	0.60(0.58)	0.97	45378.4	13510.00
31	1095.81	227.20	0.230	0.60(0.58)	0.97	46218.1	10910.00
32	1080.46	231.02	0.229	0.60(0.58)	0.97	46841.1	13500.00
33	926.33	268.67	0.215	0.60(0.58)	0.97	52817.9	12410.00
34	874.72	301.90	0.203	0.60(0.58)	0.97	58896.1	12261.00
35	857.00	314.89	0.198	0.60(0.58)	0.98	60380.9	10410.00
36	839.80	327.16	0.193	0.60(0.59)	0.98	61486.7	12101.10
37	801.02	354.80	0.183	0.60(0.59)	0.98	63864.5	10200.00
38	781.81	368.31	0.180	0.60(0.59)	0.98	64804.1	12010.00
39	738.54	398.01	0.177	0.60(0.59)	0.98	65481.5	10210.00
40	677.54	447.74	0.173	0.60(0.59)	0.98	65983.2	12000.00
41	636.26	515.18	0.166	0.60(0.59)	0.98	66551.6	10100.00

TOTAL AREA(ACRES) = 66551.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1296.56 Tc(MIN.) = 67.396
EFFECTIVE AREA(ACRES) = 10910.58 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 66551.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 66551.6 TC(MIN.) = 67.40
EFFECTIVE AREA(ACRES) = 10910.58 AREA-AVERAGED Fm(INCH/HR)= 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.976
PEAK FLOW RATE(CFS) = 1296.56

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1204.33	24.31	0.675	0.60(0.59)	0.98	2702.6	21100.00
2	1205.11	29.80	0.590	0.60(0.59)	0.98	3461.7	21000.00
3	1203.90	30.21	0.585	0.60(0.59)	0.98	3519.7	50800.00
4	1195.21	32.96	0.563	0.60(0.59)	0.98	3902.4	50700.00
5	1192.35	33.79	0.556	0.60(0.59)	0.98	4011.5	50600.00
6	1187.35	35.45	0.542	0.60(0.59)	0.98	4243.9	20810.00
7	1185.98	36.03	0.538	0.60(0.59)	0.98	4330.0	20900.00
8	1169.81	40.95	0.500	0.60(0.59)	0.98	5041.1	50500.00
9	1166.67	41.49	0.497	0.60(0.59)	0.98	5115.9	20800.00
10	1164.94	41.74	0.495	0.60(0.59)	0.98	5150.6	30910.00
11	1180.16	46.85	0.466	0.60(0.59)	0.98	6283.3	20700.00
12	1254.34	60.91	0.404	0.60(0.59)	0.98	9457.8	20600.00
13	1296.56	67.40	0.390	0.60(0.58)	0.98	10910.6	30100.00
14	1276.62	69.98	0.384	0.60(0.58)	0.97	11543.7	20500.00
15	1238.35	74.08	0.375	0.60(0.58)	0.97	12489.9	10100.00
16	1232.09	74.74	0.374	0.60(0.58)	0.97	12637.3	20400.00
17	1212.28	76.25	0.371	0.60(0.58)	0.97	12950.9	20300.00
18	1124.12	83.63	0.355	0.60(0.58)	0.97	14490.0	20200.00
19	1115.15	84.41	0.353	0.60(0.58)	0.97	14652.2	20210.00
20	1105.03	85.37	0.351	0.60(0.58)	0.97	14855.1	21400.00
21	1088.40	88.24	0.345	0.60(0.58)	0.97	15460.6	20100.00
22	1049.19	95.76	0.333	0.60(0.58)	0.96	17048.8	13600.00
23	967.92	113.64	0.306	0.60(0.58)	0.96	20790.3	13200.00
24	966.52	123.92	0.294	0.60(0.58)	0.96	22758.4	40100.00
25	1007.89	136.01	0.284	0.60(0.58)	0.96	25043.0	11831.00
26	1097.80	158.60	0.265	0.60(0.58)	0.96	29512.9	11530.00

27	1160.26	177.65	0.250	0.60(0.58)	0.96	33860.4	11000.00
28	1246.80	199.42	0.241	0.60(0.58)	0.97	40869.5	10850.00
29	1159.54	215.48	0.235	0.60(0.58)	0.97	44377.8	11220.00
30	1124.21	221.74	0.232	0.60(0.58)	0.97	45378.4	13510.00
31	1095.81	227.20	0.230	0.60(0.58)	0.97	46218.1	10910.00
32	1080.46	231.02	0.229	0.60(0.58)	0.97	46841.1	13500.00
33	926.33	268.67	0.215	0.60(0.58)	0.97	52817.9	12410.00
34	874.72	301.90	0.203	0.60(0.58)	0.97	58896.1	12261.00
35	857.00	314.89	0.198	0.60(0.58)	0.98	60380.9	10410.00
36	839.80	327.16	0.193	0.60(0.59)	0.98	61486.7	12101.10
37	801.02	354.80	0.183	0.60(0.59)	0.98	63864.5	10200.00
38	781.81	368.31	0.180	0.60(0.59)	0.98	64804.1	12010.00
39	738.54	398.01	0.177	0.60(0.59)	0.98	65481.5	10210.00
40	677.54	447.74	0.173	0.60(0.59)	0.98	65983.2	12000.00
41	636.26	515.18	0.166	0.60(0.59)	0.98	66551.6	10100.00

END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S35.DAT
  TIME/DATE OF STUDY: 08:01 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.596
   2)   10.00;  1.064
   3)   15.00;  0.843
   4)   20.00;  0.715
   5)   25.00;  0.629
   6)   30.00;  0.560
   7)   40.00;  0.480
   8)   50.00;  0.423
   9)   60.00;  0.371
  10)   90.00;  0.302
  11)  120.00;  0.256
  12)  180.00;  0.208
  13)  360.00;  0.142
  14) 1440.00;  0.060
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13500.00 TO NODE  13500.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   548.43
  ELEVATION DATA: UPSTREAM(FEET) =   1183.47  DOWNSTREAM(FEET) =   1065.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.955
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.978
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        5.11      0.60     1.000     0   11.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.74
  TOTAL AREA(ACRES) =      5.11   PEAK FLOW RATE(CFS) =      1.74

**************************************************************************
  FLOW PROCESS FROM NODE  13500.50 TO NODE  13501.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1065.00  DOWNSTREAM(FEET) =   1033.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =   431.71   CHANNEL SLOPE =  0.0738
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.865
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.87      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.83
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   2.54
  Tc(MIN.) =   14.49
  SUBAREA AREA(ACRES) =     8.87       SUBAREA RUNOFF(CFS) =    2.12
  EFFECTIVE AREA(ACRES) =     13.98     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.0         PEAK FLOW RATE(CFS) =       3.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   2.96
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13501.00 =     980.14 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13501.00 TO NODE  13502.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1033.15  DOWNSTREAM(FEET) =    990.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.63   CHANNEL SLOPE =  0.0452
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.706
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.82      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.62
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   6.04
  Tc(MIN.) =   20.53
  SUBAREA AREA(ACRES) =    16.82       SUBAREA RUNOFF(CFS) =    1.61
  EFFECTIVE AREA(ACRES) =     30.80     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       30.8         PEAK FLOW RATE(CFS) =       3.34
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   2.45
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13502.00 =    1928.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13502.00 TO NODE  13503.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.26  DOWNSTREAM(FEET) =    956.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.98   CHANNEL SLOPE =  0.0363
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.596
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.02      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.30
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   6.83
  Tc(MIN.) =   27.36
  SUBAREA AREA(ACRES) =    46.02       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =     76.82     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =       76.8         PEAK FLOW RATE(CFS) =       3.34
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   2.28
```



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  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13503.00 =    2869.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13503.00 TO NODE  13504.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    956.06  DOWNSTREAM(FEET) =    889.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2131.31   CHANNEL SLOPE =  0.0312
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.457
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.46      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.14
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =  16.63
  Tc(MIN.) =   43.98
  SUBAREA AREA(ACRES) =    58.46       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    135.28     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      135.3         PEAK FLOW RATE(CFS) =       3.34
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.72   FLOW VELOCITY(FEET/SEC.) =   2.14
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13504.00 =    5001.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13504.00 TO NODE  13505.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    889.48  DOWNSTREAM(FEET) =    848.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1661.97   CHANNEL SLOPE =  0.0249
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.381
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       49.30      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.97
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  AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =  14.08
  Tc(MIN.) =   58.07
  SUBAREA AREA(ACRES) =    49.30       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    184.58     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      184.6         PEAK FLOW RATE(CFS) =       3.34
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.75   FLOW VELOCITY(FEET/SEC.) =   1.97
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.00 =    6663.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.00 TO NODE  13505.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    848.10  DOWNSTREAM(FEET) =    811.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1234.61   CHANNEL SLOPE =  0.0300
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.355
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.35      0.60     0.811     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.811
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.28
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   9.03
  Tc(MIN.) =   67.10
  SUBAREA AREA(ACRES) =    39.35       SUBAREA RUNOFF(CFS) =    2.37
  EFFECTIVE AREA(ACRES) =    223.93     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      223.9         PEAK FLOW RATE(CFS) =       3.34
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.73   FLOW VELOCITY(FEET/SEC.) =   2.10
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.50 =    7897.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.50 TO NODE  13506.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    811.10  DOWNSTREAM(FEET) =    781.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1415.98   CHANNEL SLOPE =  0.0213
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```



```
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.329
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.33      0.60     0.738     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.738
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.10
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =  11.23
  Tc(MIN.) =   78.32
  SUBAREA AREA(ACRES) =    54.33       SUBAREA RUNOFF(CFS) =    4.21
  EFFECTIVE AREA(ACRES) =    278.26     AREA-AVERAGED Fm(INCH/HR) =   0.55
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.92
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      278.3         PEAK FLOW RATE(CFS) =       6.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =   2.19
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.00 =    9313.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13506.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    781.00  DOWNSTREAM(FEET) =    743.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1542.62   CHANNEL SLOPE =  0.0245
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.305
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.33      0.60     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.45
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =  10.48
  Tc(MIN.) =   88.80
  SUBAREA AREA(ACRES) =    61.33       SUBAREA RUNOFF(CFS) =    3.65
  EFFECTIVE AREA(ACRES) =    339.59     AREA-AVERAGED Fm(INCH/HR) =   0.54
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.90
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      339.6         PEAK FLOW RATE(CFS) =       9.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   2.56
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.50 =   10856.24 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13506.50 TO NODE  13520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    743.17  DOWNSTREAM(FEET) =    717.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1370.93   CHANNEL SLOPE =  0.0191
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.289
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.86      0.60     0.848     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.848
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.36
  AVERAGE FLOW DEPTH(FEET) =   1.21   TRAVEL TIME(MIN.) =   9.67
  Tc(MIN.) =   98.47
  SUBAREA AREA(ACRES) =    39.86       SUBAREA RUNOFF(CFS) =    1.58
  EFFECTIVE AREA(ACRES) =    379.45     AREA-AVERAGED Fm(INCH/HR) =   0.53
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.89
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      379.5         PEAK FLOW RATE(CFS) =      10.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   2.38
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   98.47
  RAINFALL INTENSITY(INCH/HR) =   0.29
  AREA-AVERAGED Fm(INCH/HR) =  0.53
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     379.45
  TOTAL STREAM AREA(ACRES) =     379.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.67

****************************************************************************
  FLOW PROCESS FROM NODE  13510.00 TO NODE  13511.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   903.68
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  ELEVATION DATA: UPSTREAM(FEET) =   1216.90  DOWNSTREAM(FEET) =   1022.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.615
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.860
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.60     1.000     0   14.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.56
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =      1.56

****************************************************************************
  FLOW PROCESS FROM NODE  13511.00 TO NODE  13512.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1022.78  DOWNSTREAM(FEET) =    954.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1027.63   CHANNEL SLOPE =  0.0667
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.699
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       25.40      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.72
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   6.29
  Tc(MIN.) =   20.91
  SUBAREA AREA(ACRES) =    25.40       SUBAREA RUNOFF(CFS) =    2.27
  EFFECTIVE AREA(ACRES) =     32.06     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       32.1         PEAK FLOW RATE(CFS) =       2.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   2.75
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13512.00 =    1931.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13512.00 TO NODE  13513.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    954.27  DOWNSTREAM(FEET) =    872.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.42   CHANNEL SLOPE =  0.0425
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.522
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       90.23      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.31
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =  13.90
  Tc(MIN.) =   34.81
  SUBAREA AREA(ACRES) =    90.23       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    122.29     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      122.3         PEAK FLOW RATE(CFS) =       2.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   2.31
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13513.00 =    3857.73 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13513.00 TO NODE  13514.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    872.45  DOWNSTREAM(FEET) =    813.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1895.66   CHANNEL SLOPE =  0.0313
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.422
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      135.65      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.06
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =  15.35
  Tc(MIN.) =   50.16
  SUBAREA AREA(ACRES) =   135.65       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    257.94     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      257.9         PEAK FLOW RATE(CFS) =       2.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   2.06
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13514.00 =    5753.39 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  13514.00 TO NODE  13515.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    813.12  DOWNSTREAM(FEET) =    773.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.15   CHANNEL SLOPE =  0.0204
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.352
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      109.30      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.76
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =  18.23
  Tc(MIN.) =   68.39
  SUBAREA AREA(ACRES) =   109.30       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    367.24     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      367.2         PEAK FLOW RATE(CFS) =       2.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   1.76
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13515.00 =    7679.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    773.74  DOWNSTREAM(FEET) =    717.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2279.49   CHANNEL SLOPE =  0.0249
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.305
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      231.44      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.89
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =  20.15
  Tc(MIN.) =   88.54
  SUBAREA AREA(ACRES) =   231.44       SUBAREA RUNOFF(CFS) =    0.00
```

```
  EFFECTIVE AREA(ACRES) =    598.68     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      598.7         PEAK FLOW RATE(CFS) =       2.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   1.89
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13520.00 =    9959.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   88.54
  RAINFALL INTENSITY(INCH/HR) =   0.31
  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     598.68
  TOTAL STREAM AREA(ACRES) =     598.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.87

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.67   98.47    0.289  0.60( 0.53) 0.89     379.5   13500.00
      2        2.87   88.54    0.305  0.60( 0.60) 1.00     598.7   13510.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       13.01   88.54    0.305  0.60( 0.58) 0.96     939.8   13510.00
      2       13.39   98.47    0.289  0.60( 0.57) 0.96     978.1   13500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      13.39    Tc(MIN.) =    98.47
  EFFECTIVE AREA(ACRES) =     978.13   AREA-AVERAGED Fm(INCH/HR) =  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =      978.1
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13520.00 TO NODE  13520.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    717.04  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.22   CHANNEL SLOPE =  0.0084
```



```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.269
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      193.31      0.60     0.965     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.965
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.55
  AVERAGE FLOW DEPTH(FEET) =   1.36   TRAVEL TIME(MIN.) =  13.19
  Tc(MIN.) =  111.67
  SUBAREA AREA(ACRES) =   193.31       SUBAREA RUNOFF(CFS) =    1.64
  EFFECTIVE AREA(ACRES) =   1171.44     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.96
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1171.4         PEAK FLOW RATE(CFS) =      13.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.33   FLOW VELOCITY(FEET/SEC.) =   2.51
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.50 =   14246.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13520.50 TO NODE  13521.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    661.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1622.36   CHANNEL SLOPE =  0.0235
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.258
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      129.79      0.60     0.897     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.897
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.78
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   7.15
  Tc(MIN.) =  118.81
  SUBAREA AREA(ACRES) =   129.79       SUBAREA RUNOFF(CFS) =    3.10
  EFFECTIVE AREA(ACRES) =   1301.23     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.95
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1301.2         PEAK FLOW RATE(CFS) =      14.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   3.74
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13521.00 =   15868.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13521.00 TO NODE  13522.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    661.95  DOWNSTREAM(FEET) =    632.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2746.01   CHANNEL SLOPE =  0.0108
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.244
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      278.60      0.60     0.905     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.905
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.94
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =  15.58
  Tc(MIN.) =  134.40
  SUBAREA AREA(ACRES) =   278.60       SUBAREA RUNOFF(CFS) =    5.82
  EFFECTIVE AREA(ACRES) =   1579.83     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.94
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1579.8         PEAK FLOW RATE(CFS) =      19.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.46   FLOW VELOCITY(FEET/SEC.) =   3.02
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13522.00 =   18614.76 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1579.8  TC(MIN.) =    134.40
  EFFECTIVE AREA(ACRES) =   1579.83  AREA-AVERAGED Fm(INCH/HR)=  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.945
  PEAK FLOW RATE(CFS)   =      19.28

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       18.96  124.68    0.252  0.60( 0.57) 0.95    1541.5   13510.00
      2       19.28  134.40    0.244  0.60( 0.57) 0.94    1579.8   13500.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

------------------------------------------------------------------------------
  FILE NAME: S36.DAT
  TIME/DATE OF STUDY: 08:02 07/16/2018
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.806
   2)   10.00;  1.204
   3)   15.00;  0.925
   4)   20.00;  0.762
   5)   25.00;  0.659
   6)   30.00;  0.585
   7)   40.00;  0.504
   8)   50.00;  0.447
   9)   60.00;  0.403
  10)   90.00;  0.339
  11)  120.00;  0.294
  12)  180.00;  0.245
  13)  360.00;  0.179
  14) 1440.00;  0.078
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
******************************************************************************
  FLOW PROCESS FROM NODE  13600.00 TO NODE  13600.50 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   488.61
  ELEVATION DATA: UPSTREAM(FEET) =    872.12  DOWNSTREAM(FEET) =    744.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.995
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.149
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        3.39      0.60     1.000     0   11.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.67
  TOTAL AREA(ACRES) =      3.39   PEAK FLOW RATE(CFS) =      1.67

******************************************************************************
  FLOW PROCESS FROM NODE  13600.50 TO NODE  13601.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    744.80  DOWNSTREAM(FEET) =    707.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =   418.30   CHANNEL SLOPE =  0.0896
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.024
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.45      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.13
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   13.22
  SUBAREA AREA(ACRES) =     7.45       SUBAREA RUNOFF(CFS) =    2.84
  EFFECTIVE AREA(ACRES) =     10.84     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       10.8         PEAK FLOW RATE(CFS) =       4.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   3.33
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13601.00 =     906.91 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  13601.00 TO NODE  13602.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    707.32  DOWNSTREAM(FEET) =    657.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   777.60   CHANNEL SLOPE =  0.0646
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.862
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.96      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.50
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   3.71
  Tc(MIN.) =   16.93
  SUBAREA AREA(ACRES) =    30.96       SUBAREA RUNOFF(CFS) =    7.30
  EFFECTIVE AREA(ACRES) =     41.80     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.8         PEAK FLOW RATE(CFS) =       9.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.94   FLOW VELOCITY(FEET/SEC.) =   3.69
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13602.00 =    1684.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13602.00 TO NODE  13603.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.12  DOWNSTREAM(FEET) =    584.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1186.54   CHANNEL SLOPE =  0.0611
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.716
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.36      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.73
  AVERAGE FLOW DEPTH(FEET) =   1.00   TRAVEL TIME(MIN.) =   5.30
  Tc(MIN.) =   22.23
  SUBAREA AREA(ACRES) =    23.36       SUBAREA RUNOFF(CFS) =    2.45
  EFFECTIVE AREA(ACRES) =     65.16     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       65.2         PEAK FLOW RATE(CFS) =       9.86
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   3.59
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13603.00 =    2871.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  51
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.58  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   860.98   CHANNEL SLOPE =  0.0461
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.635
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.24      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.28
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   4.38
  Tc(MIN.) =   26.61
  SUBAREA AREA(ACRES) =    21.24       SUBAREA RUNOFF(CFS) =    0.68
  EFFECTIVE AREA(ACRES) =     86.40     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       86.4         PEAK FLOW RATE(CFS) =       9.86
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   3.26
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S35.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       18.96  124.68  0.60( 0.57) 0.95    1541.5   13510.00
      2       19.28  134.40  0.60( 0.57) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =     1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       18.96  124.68  0.60( 0.57) 0.95    1541.5   13510.00
      2       19.28  134.40  0.60( 0.57) 0.94    1579.8   13500.00
```

```
    TOTAL AREA(ACRES) =      1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13523.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    632.19  DOWNSTREAM(FEET) =    561.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1151.68   CHANNEL SLOPE =  0.0618
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      19.28
  FLOW VELOCITY(FEET/SEC.) =   5.83   FLOW DEPTH(FEET) =   1.05
  TRAVEL TIME(MIN.) =   3.29   Tc(MIN.) =  137.69
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       21.63  127.98    0.288  0.60( 0.57) 0.95    1541.5   13510.00
      2       22.07  137.69    0.280  0.60( 0.57) 0.94    1579.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      22.07  Tc(MIN.) =  137.69
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.94  EFFECTIVE AREA(ACRES) =    1579.83

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610201T.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        8.36   17.46  0.60( 0.60) 1.00      37.9   20100.00
    TOTAL AREA(ACRES) =       37.9

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       21.63  127.98    0.288  0.60( 0.57) 0.95    1541.5   13510.00
      2       22.07  137.69    0.280  0.60( 0.57) 0.94    1579.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.
```



```
  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        8.36   17.46    0.845  0.60( 0.60) 1.00      37.9   20100.00
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  13523.00 =    2767.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       29.99   17.46    0.845  0.60( 0.57) 0.95     248.3   20100.00
      2       21.63  127.98    0.288  0.60( 0.57) 0.95    1579.5   13510.00
      3       22.07  137.69    0.280  0.60( 0.57) 0.95    1617.8   13500.00
    TOTAL AREA(ACRES) =      1617.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       29.99  Tc(MIN.) =   17.461
  EFFECTIVE AREA(ACRES) =    248.25  AREA-AVERAGED Fm(INCH/HR) =  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1617.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13524.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    561.00  DOWNSTREAM(FEET) =    556.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   238.34   CHANNEL SLOPE =  0.0210
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      29.99
  FLOW VELOCITY(FEET/SEC.) =   4.32   FLOW DEPTH(FEET) =   1.52
  TRAVEL TIME(MIN.) =   0.92   Tc(MIN.) =   18.38
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.17   18.38    0.815  0.60( 0.57) 0.95     248.3   20100.00
      2       21.63  128.98    0.287  0.60( 0.57) 0.95    1579.5   13510.00
      3       22.07  138.68    0.279  0.60( 0.57) 0.95    1617.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      54.17  Tc(MIN.) =   18.38
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =     248.25

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
```

```
 PEAK FLOWRATE TABLE FILE NAME: 0610202T.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1        8.14   15.32  0.60( 0.60) 1.00      28.8   20200.00
     2        7.91   15.71  0.60( 0.60) 1.00      29.1   20210.00
    TOTAL AREA(ACRES) =       29.1

****************************************************************************
 FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       54.17   18.38    0.815  0.60( 0.57) 0.95     248.3   20100.00
     2       21.63  128.98    0.287  0.60( 0.57) 0.95    1579.5   13510.00
     3       22.07  138.68    0.279  0.60( 0.57) 0.95    1617.8   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        8.14   15.32    0.914  0.60( 0.60) 1.00      28.8   20200.00
     2        7.91   15.71    0.902  0.60( 0.60) 1.00      29.1   20210.00
 LONGEST FLOWPATH FROM NODE  20210.00 TO NODE  13524.00 =    2247.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       62.31   15.32    0.914  0.60( 0.58) 0.96     235.7   20200.00
     2       62.08   15.71    0.902  0.60( 0.58) 0.96     241.2   20210.00
     3       59.80   18.38    0.815  0.60( 0.58) 0.96     277.4   20100.00
     4       21.63  128.98    0.287  0.60( 0.57) 0.95    1608.6   13510.00
     5       22.07  138.68    0.279  0.60( 0.57) 0.95    1646.9   13500.00
    TOTAL AREA(ACRES) =      1646.9

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       62.31  Tc(MIN.) =   15.319
 EFFECTIVE AREA(ACRES) =    235.67  AREA-AVERAGED Fm(INCH/HR) =  0.58
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.95
 TOTAL AREA(ACRES) =     1646.9
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13524.00 TO NODE  13620.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    556.00  DOWNSTREAM(FEET) =    544.91
 CHANNEL LENGTH THRU SUBAREA(FEET) =   672.93   CHANNEL SLOPE =  0.0165
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.839
 SUBAREA LOSS RATE DATA(AMC  II):
```



```
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                 -       27.94      0.60      0.884     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.884
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      66.19
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.81
 AVERAGE FLOW DEPTH(FEET) =   2.14   TRAVEL TIME(MIN.) =   2.33
 Tc(MIN.) =   17.65
 SUBAREA AREA(ACRES) =    27.94       SUBAREA RUNOFF(CFS) =    7.75
 EFFECTIVE AREA(ACRES) =    263.61     AREA-AVERAGED Fm(INCH/HR) =   0.57
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.95
 TOTAL AREA(ACRES) =     1674.8          PEAK FLOW RATE(CFS) =      63.51

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.11   FLOW VELOCITY(FEET/SEC.) =   4.76
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       63.51   17.65    0.839  0.60( 0.57) 0.95     263.6   20200.00
     2       62.08   18.03    0.826  0.60( 0.57) 0.95     269.2   20210.00
     3       59.80   20.74    0.747  0.60( 0.57) 0.95     305.3   20100.00
     4       22.21  132.04    0.284  0.60( 0.57) 0.95    1636.5   13510.00
     5       22.62  141.74    0.277  0.60( 0.57) 0.95    1674.8   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =       63.51  Tc(MIN.) =   17.65
 AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =     263.61

****************************************************************************
 FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       63.51   17.65    0.839  0.60( 0.57) 0.95     263.6   20200.00
     2       62.08   18.03    0.826  0.60( 0.57) 0.95     269.2   20210.00
     3       59.80   20.74    0.747  0.60( 0.57) 0.95     305.3   20100.00
     4       22.21  132.04    0.284  0.60( 0.57) 0.95    1636.5   13510.00
     5       22.62  141.74    0.277  0.60( 0.57) 0.95    1674.8   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        9.86   26.61    0.635  0.60( 0.60) 1.00      86.4   13600.00
 LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       73.37   17.65    0.839  0.60( 0.58) 0.96     320.9   20200.00
     2       71.94   18.03    0.826  0.60( 0.58) 0.96     327.7   20210.00
```

```
      3       69.66   20.74    0.747  0.60( 0.58) 0.96     372.7   20100.00
      4       67.68   26.61    0.635  0.60( 0.58) 0.96     461.9   13600.00
      5       22.21  132.04    0.284  0.60( 0.57) 0.95    1722.9   13510.00
      6       22.62  141.74    0.277  0.60( 0.57) 0.95    1761.2   13500.00
    TOTAL AREA(ACRES) =      1761.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       73.37  Tc(MIN.) =   17.650
  EFFECTIVE AREA(ACRES) =    320.92  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1761.2
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13620.00 TO NODE  13621.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    544.91  DOWNSTREAM(FEET) =    527.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   868.57   CHANNEL SLOPE =  0.0206
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      73.37
  FLOW VELOCITY(FEET/SEC.) =   5.37   FLOW DEPTH(FEET) =   2.13
  TRAVEL TIME(MIN.) =   2.69   Tc(MIN.) =   20.34
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       73.37   20.34    0.755  0.60( 0.58) 0.96     320.9   20200.00
      2       71.94   20.74    0.747  0.60( 0.58) 0.96     327.7   20210.00
      3       69.66   23.48    0.691  0.60( 0.58) 0.96     372.7   20100.00
      4       67.68   29.36    0.595  0.60( 0.58) 0.96     461.9   13600.00
      5       22.21  135.68    0.281  0.60( 0.57) 0.95    1722.9   13510.00
      6       22.62  145.35    0.274  0.60( 0.57) 0.95    1761.2   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      73.37  Tc(MIN.) =   20.34
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =     320.92

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610203T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1        6.97   16.31  0.60( 0.60) 1.00      27.4   20300.00
```



```
    TOTAL AREA(ACRES) =       27.4

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       73.37   20.34    0.755  0.60( 0.58) 0.96     320.9   20200.00
      2       71.94   20.74    0.747  0.60( 0.58) 0.96     327.7   20210.00
      3       69.66   23.48    0.691  0.60( 0.58) 0.96     372.7   20100.00
      4       67.68   29.36    0.595  0.60( 0.58) 0.96     461.9   13600.00
      5       22.21  135.68    0.281  0.60( 0.57) 0.95    1722.9   13510.00
      6       22.62  145.35    0.274  0.60( 0.57) 0.95    1761.2   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        6.97   16.31    0.882  0.60( 0.60) 1.00      27.4   20300.00
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  13621.00 =    2609.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       80.34   16.31    0.882  0.60( 0.58) 0.96     284.6   20300.00
      2       77.20   20.34    0.755  0.60( 0.58) 0.96     348.3   20200.00
      3       75.57   20.74    0.747  0.60( 0.58) 0.96     355.1   20210.00
      4       71.91   23.48    0.691  0.60( 0.58) 0.96     400.1   20100.00
      5       67.68   29.36    0.595  0.60( 0.58) 0.96     489.3   13600.00
      6       22.21  135.68    0.281  0.60( 0.57) 0.95    1750.3   13510.00
      7       22.62  145.35    0.274  0.60( 0.57) 0.95    1788.6   13500.00
    TOTAL AREA(ACRES) =      1788.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       80.34  Tc(MIN.) =   16.305
  EFFECTIVE AREA(ACRES) =    284.63  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1788.6
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13622.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    527.00  DOWNSTREAM(FEET) =    512.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    56.08   CHANNEL SLOPE =  0.2675
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      80.34
  FLOW VELOCITY(FEET/SEC.) =  14.42   FLOW DEPTH(FEET) =   1.36
  TRAVEL TIME(MIN.) =   0.06   Tc(MIN.) =   16.37
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       80.34   16.37    0.880  0.60( 0.58) 0.96     284.6   20300.00
     2       77.20   20.41    0.754  0.60( 0.58) 0.96     348.3   20200.00
     3       75.57   20.81    0.746  0.60( 0.58) 0.96     355.1   20210.00
     4       71.91   23.54    0.689  0.60( 0.58) 0.96     400.1   20100.00
     5       67.68   29.43    0.594  0.60( 0.58) 0.96     489.3   13600.00
     6       22.21  135.77    0.281  0.60( 0.57) 0.95    1750.3   13510.00
     7       22.62  145.44    0.273  0.60( 0.57) 0.95    1788.6   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =      80.34  Tc(MIN.) =   16.37
 AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =     284.63

****************************************************************************
 FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610204T.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1        8.80   15.63  0.60( 0.60) 1.00      32.2   20400.00
   TOTAL AREA(ACRES) =       32.2

****************************************************************************
 FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       80.34   16.37    0.880  0.60( 0.58) 0.96     284.6   20300.00
     2       77.20   20.41    0.754  0.60( 0.58) 0.96     348.3   20200.00
     3       75.57   20.81    0.746  0.60( 0.58) 0.96     355.1   20210.00
     4       71.91   23.54    0.689  0.60( 0.58) 0.96     400.1   20100.00
     5       67.68   29.43    0.594  0.60( 0.58) 0.96     489.3   13600.00
     6       22.21  135.77    0.281  0.60( 0.57) 0.95    1750.3   13510.00
     7       22.62  145.44    0.273  0.60( 0.57) 0.95    1788.6   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        8.80   15.63    0.904  0.60( 0.60) 1.00      32.2   20400.00
 LONGEST FLOWPATH FROM NODE  20400.00 TO NODE  13622.00 =    2281.00 FEET.
```



```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       89.14   15.63    0.904  0.60( 0.58) 0.97     304.0   20400.00
     2       88.45   16.37    0.880  0.60( 0.58) 0.97     316.8   20300.00
     3       81.65   20.41    0.754  0.60( 0.58) 0.97     380.5   20200.00
     4       79.79   20.81    0.746  0.60( 0.58) 0.97     387.3   20210.00
     5       74.50   23.54    0.689  0.60( 0.58) 0.97     432.2   20100.00
     6       67.68   29.43    0.594  0.60( 0.58) 0.97     521.4   13600.00
     7       22.21  135.77    0.281  0.60( 0.57) 0.95    1782.5   13510.00
     8       22.62  145.44    0.273  0.60( 0.57) 0.95    1820.8   13500.00
   TOTAL AREA(ACRES) =      1820.8

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       89.14  Tc(MIN.) =   15.634
 EFFECTIVE AREA(ACRES) =    304.00  AREA-AVERAGED Fm(INCH/HR) =  0.58
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.95
 TOTAL AREA(ACRES) =     1820.8
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13622.00 TO NODE  13640.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    512.00  DOWNSTREAM(FEET) =    489.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   459.72   CHANNEL SLOPE =  0.0500
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.874
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      112.88      0.60      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     103.05
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.18
 AVERAGE FLOW DEPTH(FEET) =   2.05   TRAVEL TIME(MIN.) =   0.94
 Tc(MIN.) =   16.57
 SUBAREA AREA(ACRES) =   112.88       SUBAREA RUNOFF(CFS) =   27.81
 EFFECTIVE AREA(ACRES) =    416.88     AREA-AVERAGED Fm(INCH/HR) =   0.59
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =     1933.7          PEAK FLOW RATE(CFS) =     107.97

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.09   FLOW VELOCITY(FEET/SEC.) =   8.26
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      107.97   16.57    0.874  0.60( 0.59) 0.98     416.9   20400.00
     2      102.01   17.32    0.849  0.60( 0.59) 0.98     429.7   20300.00
     3       81.65   21.38    0.734  0.60( 0.58) 0.97     493.4   20200.00
     4       79.79   21.79    0.725  0.60( 0.58) 0.97     500.2   20210.00
     5       74.50   24.55    0.669  0.60( 0.58) 0.97     545.1   20100.00
```

```
     6       67.68   30.47    0.581  0.60( 0.58) 0.97     634.3   13600.00
     7       22.21  137.15    0.280  0.60( 0.57) 0.95    1895.4   13510.00
     8       22.62  146.81    0.272  0.60( 0.57) 0.95    1933.7   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     107.97  Tc(MIN.) =   16.57
  AREA-AVERAGED Fm(INCH/HR) =  0.59  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =     416.88

****************************************************************************
  FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610205T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        3.47   12.24  0.60( 0.60) 1.00       8.1   20500.00
    TOTAL AREA(ACRES) =        8.1

****************************************************************************
  FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      107.97   16.57    0.874  0.60( 0.59) 0.98     416.9   20400.00
      2      102.01   17.32    0.849  0.60( 0.59) 0.98     429.7   20300.00
      3       81.65   21.38    0.734  0.60( 0.58) 0.97     493.4   20200.00
      4       79.79   21.79    0.725  0.60( 0.58) 0.97     500.2   20210.00
      5       74.50   24.55    0.669  0.60( 0.58) 0.97     545.1   20100.00
      6       67.68   30.47    0.581  0.60( 0.58) 0.97     634.3   13600.00
      7       22.21  137.15    0.280  0.60( 0.57) 0.95    1895.4   13510.00
      8       22.62  146.81    0.272  0.60( 0.57) 0.95    1933.7   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.47   12.24    1.079  0.60( 0.60) 1.00       8.1   20500.00
  LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  13640.00 =    1025.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      111.45   12.24    1.079  0.60( 0.59) 0.98     315.9   20500.00
      2      109.96   16.57    0.874  0.60( 0.59) 0.98     424.9   20400.00
      3      103.82   17.32    0.849  0.60( 0.59) 0.98     437.7   20300.00
      4       82.62   21.38    0.734  0.60( 0.58) 0.97     501.4   20200.00
      5       80.70   21.79    0.725  0.60( 0.58) 0.97     508.2   20210.00
      6       74.99   24.55    0.669  0.60( 0.58) 0.97     553.2   20100.00
      7       67.68   30.47    0.581  0.60( 0.58) 0.97     642.4   13600.00
      8       22.21  137.15    0.280  0.60( 0.57) 0.95    1903.4   13510.00
      9       22.62  146.81    0.272  0.60( 0.57) 0.95    1941.7   13500.00
    TOTAL AREA(ACRES) =      1941.7
```



```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      111.45  Tc(MIN.) =   12.239
  EFFECTIVE AREA(ACRES) =    315.95  AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1941.7
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13640.00 TO NODE  13641.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    489.00  DOWNSTREAM(FEET) =    436.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2992.90   CHANNEL SLOPE =  0.0174
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.744
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      180.31      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     123.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.76
  AVERAGE FLOW DEPTH(FEET) =   2.68   TRAVEL TIME(MIN.) =   8.66
  Tc(MIN.) =   20.90
  SUBAREA AREA(ACRES) =   180.31       SUBAREA RUNOFF(CFS) =   23.33
  EFFECTIVE AREA(ACRES) =    496.26     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     2122.0          PEAK FLOW RATE(CFS) =     111.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.58   FLOW VELOCITY(FEET/SEC.) =   5.60
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13641.00 =   25054.98 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      111.45   20.90    0.744  0.60( 0.59) 0.99     496.3   20500.00
      2      109.96   25.42    0.653  0.60( 0.59) 0.98     605.2   20400.00
      3      103.82   26.28    0.640  0.60( 0.59) 0.98     618.0   20300.00
      4       82.62   30.97    0.577  0.60( 0.59) 0.98     681.7   20200.00
      5       80.70   31.46    0.573  0.60( 0.59) 0.98     688.6   20210.00
      6       74.99   34.36    0.550  0.60( 0.59) 0.98     733.5   20100.00
      7       67.68   40.53    0.501  0.60( 0.59) 0.98     822.7   13600.00
      8       22.21  150.48    0.269  0.60( 0.57) 0.96    2083.7   13510.00
      9       22.62  160.08    0.261  0.60( 0.57) 0.96    2122.0   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     111.45  Tc(MIN.) =   20.90
  AREA-AVERAGED Fm(INCH/HR) =  0.59  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =     496.26

****************************************************************************
  FLOW PROCESS FROM NODE  13641.00 TO NODE  13642.00 IS CODE =  51
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.89  DOWNSTREAM(FEET) =    394.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2814.16   CHANNEL SLOPE =  0.0150
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.589
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      451.39      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     111.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.29
  AVERAGE FLOW DEPTH(FEET) =   2.65   TRAVEL TIME(MIN.) =   8.86
  Tc(MIN.) =   29.76
  SUBAREA AREA(ACRES) =   451.39       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    947.65     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     2573.4         PEAK FLOW RATE(CFS) =     111.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.65   FLOW VELOCITY(FEET/SEC.) =   5.29
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13642.00 =   27869.14 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      111.45   29.76    0.589  0.60( 0.60) 0.99     947.6   20500.00
      2      109.96   34.32    0.550  0.60( 0.59) 0.99    1056.6   20400.00
      3      103.82   35.31    0.542  0.60( 0.59) 0.99    1069.4   20300.00
      4       82.62   40.52    0.501  0.60( 0.59) 0.99    1133.1   20200.00
      5       80.70   41.07    0.498  0.60( 0.59) 0.99    1139.9   20210.00
      6       74.99   44.15    0.480  0.60( 0.59) 0.99    1184.9   20100.00
      7       67.68   50.60    0.444  0.60( 0.59) 0.99    1274.1   13600.00
      8       22.21  163.74    0.258  0.60( 0.58) 0.97    2535.1   13510.00
      9       22.62  173.24    0.251  0.60( 0.58) 0.96    2573.4   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     111.45  Tc(MIN.) =   29.76
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =     947.65

****************************************************************************
  FLOW PROCESS FROM NODE  13642.00 TO NODE  13643.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    394.80  DOWNSTREAM(FEET) =    342.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2913.57   CHANNEL SLOPE =  0.0180
```



```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.517
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      434.58      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     111.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.67
  AVERAGE FLOW DEPTH(FEET) =   2.56   TRAVEL TIME(MIN.) =   8.56
  Tc(MIN.) =   38.32
  SUBAREA AREA(ACRES) =   434.58       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1382.23     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3008.0         PEAK FLOW RATE(CFS) =     111.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.56   FLOW VELOCITY(FEET/SEC.) =   5.67
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13643.00 =   30782.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      111.45   38.32    0.517  0.60( 0.60) 0.99    1382.2   20500.00
      2      109.96   42.90    0.487  0.60( 0.60) 0.99    1491.2   20400.00
      3      103.82   44.03    0.481  0.60( 0.60) 0.99    1504.0   20300.00
      4       82.62   49.74    0.448  0.60( 0.59) 0.99    1567.7   20200.00
      5       80.70   50.36    0.445  0.60( 0.59) 0.99    1574.5   20210.00
      6       74.99   53.62    0.431  0.60( 0.59) 0.99    1619.5   20100.00
      7       67.68   60.31    0.403  0.60( 0.59) 0.99    1708.7   13600.00
      8       22.21  176.58    0.248  0.60( 0.58) 0.97    2969.7   13510.00
      9       22.62  185.99    0.243  0.60( 0.58) 0.97    3008.0   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     111.45  Tc(MIN.) =   38.32
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1382.23

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    342.39  DOWNSTREAM(FEET) =    300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1591.23   CHANNEL SLOPE =  0.0266
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.490
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -      109.24      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     111.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.57
  AVERAGE FLOW DEPTH(FEET) =   2.38   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   42.35
  SUBAREA AREA(ACRES) =   109.24       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1491.47     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3117.3         PEAK FLOW RATE(CFS) =     111.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.38   FLOW VELOCITY(FEET/SEC.) =   6.57
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      111.45   42.35    0.490  0.60( 0.60) 1.00    1491.5   20500.00
      2      109.96   46.96    0.464  0.60( 0.60) 0.99    1600.5   20400.00
      3      103.82   48.13    0.457  0.60( 0.60) 0.99    1613.2   20300.00
      4       82.62   54.09    0.429  0.60( 0.60) 0.99    1677.0   20200.00
      5       80.70   54.74    0.426  0.60( 0.60) 0.99    1683.8   20210.00
      6       74.99   58.07    0.412  0.60( 0.59) 0.99    1728.7   20100.00
      7       67.68   64.88    0.393  0.60( 0.59) 0.99    1817.9   13600.00
      8       22.21  182.64    0.244  0.60( 0.58) 0.97    3079.0   13510.00
      9       22.62  192.00    0.241  0.60( 0.58) 0.97    3117.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     111.45  Tc(MIN.) =   42.35
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1491.47

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610206T.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       15.14   32.76  0.60( 0.60) 1.00     186.0   20600.00
    TOTAL AREA(ACRES) =      186.0

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE =  11
```



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----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      111.45   42.35    0.490  0.60( 0.60) 1.00    1491.5   20500.00
      2      109.96   46.96    0.464  0.60( 0.60) 0.99    1600.5   20400.00
      3      103.82   48.13    0.457  0.60( 0.60) 0.99    1613.2   20300.00
      4       82.62   54.09    0.429  0.60( 0.60) 0.99    1677.0   20200.00
      5       80.70   54.74    0.426  0.60( 0.60) 0.99    1683.8   20210.00
      6       74.99   58.07    0.412  0.60( 0.59) 0.99    1728.7   20100.00
      7       67.68   64.88    0.393  0.60( 0.59) 0.99    1817.9   13600.00
      8       22.21  182.64    0.244  0.60( 0.58) 0.97    3079.0   13510.00
      9       22.62  192.00    0.241  0.60( 0.58) 0.97    3117.3   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       15.14   32.76    0.563  0.60( 0.60) 1.00     186.0   20600.00
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  13660.00 =    6967.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      114.03   32.76    0.563  0.60( 0.60) 1.00    1339.6   20600.00
      2      124.64   42.35    0.490  0.60( 0.60) 1.00    1677.5   20500.00
      3      122.44   46.96    0.464  0.60( 0.60) 0.99    1786.5   20400.00
      4      116.12   48.13    0.457  0.60( 0.60) 0.99    1799.3   20300.00
      5       94.16   54.09    0.429  0.60( 0.60) 0.99    1863.0   20200.00
      6       92.16   54.74    0.426  0.60( 0.60) 0.99    1869.8   20210.00
      7       86.07   58.07    0.412  0.60( 0.60) 0.99    1914.7   20100.00
      8       78.25   64.88    0.393  0.60( 0.59) 0.99    2003.9   13600.00
      9       28.78  182.64    0.244  0.60( 0.58) 0.97    3265.0   13510.00
     10       29.09  192.00    0.241  0.60( 0.58) 0.97    3303.3   13500.00
    TOTAL AREA(ACRES) =      3303.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      124.64  Tc(MIN.) =   42.354
  EFFECTIVE AREA(ACRES) =   1677.49  AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3303.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    300.00  DOWNSTREAM(FEET) =    288.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   933.89   CHANNEL SLOPE =  0.0128
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.473
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       61.43      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     124.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.14
  AVERAGE FLOW DEPTH(FEET) =   2.84   TRAVEL TIME(MIN.) =   3.03
  Tc(MIN.) =   45.38
  SUBAREA AREA(ACRES) =    61.43       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   1738.92     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     3364.7         PEAK FLOW RATE(CFS) =     124.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.84   FLOW VELOCITY(FEET/SEC.) =   5.14
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      114.03   35.85    0.537  0.60( 0.60) 1.00    1401.0   20600.00
      2      124.64   45.38    0.473  0.60( 0.60) 1.00    1738.9   20500.00
      3      122.44   50.00    0.447  0.60( 0.60) 0.99    1847.9   20400.00
      4      116.12   51.21    0.441  0.60( 0.60) 0.99    1860.7   20300.00
      5       94.16   57.33    0.415  0.60( 0.60) 0.99    1924.4   20200.00
      6       92.16   58.01    0.412  0.60( 0.60) 0.99    1931.2   20210.00
      7       86.07   61.39    0.400  0.60( 0.60) 0.99    1976.2   20100.00
      8       78.25   68.28    0.386  0.60( 0.59) 0.99    2065.4   13600.00
      9       28.78  187.02    0.243  0.60( 0.58) 0.97    3326.4   13510.00
     10       29.09  196.34    0.239  0.60( 0.58) 0.97    3364.7   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     124.64  Tc(MIN.) =   45.38
  AREA-AVERAGED Fm(INCH/HR) =  0.60  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1738.92

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610207T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       29.02   21.84  0.60( 0.55) 0.92     174.5   20700.00
    TOTAL AREA(ACRES) =      174.5
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      114.03   35.85    0.537  0.60( 0.60) 1.00    1401.0   20600.00
      2      124.64   45.38    0.473  0.60( 0.60) 1.00    1738.9   20500.00
      3      122.44   50.00    0.447  0.60( 0.60) 0.99    1847.9   20400.00
      4      116.12   51.21    0.441  0.60( 0.60) 0.99    1860.7   20300.00
      5       94.16   57.33    0.415  0.60( 0.60) 0.99    1924.4   20200.00
      6       92.16   58.01    0.412  0.60( 0.60) 0.99    1931.2   20210.00
      7       86.07   61.39    0.400  0.60( 0.60) 0.99    1976.2   20100.00
      8       78.25   68.28    0.386  0.60( 0.59) 0.99    2065.4   13600.00
      9       28.78  187.02    0.243  0.60( 0.58) 0.97    3326.4   13510.00
     10       29.09  196.34    0.239  0.60( 0.58) 0.97    3364.7   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       29.02   21.84    0.724  0.60( 0.55) 0.92     174.5   20700.00
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  13680.00 =    6221.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      122.64   21.84    0.724  0.60( 0.59) 0.98    1027.9   20700.00
      2      121.03   35.85    0.537  0.60( 0.59) 0.99    1575.5   20600.00
      3      130.80   45.38    0.473  0.60( 0.59) 0.99    1913.4   20500.00
      4      128.26   50.00    0.447  0.60( 0.59) 0.99    2022.4   20400.00
      5      121.87   51.21    0.441  0.60( 0.59) 0.99    2035.2   20300.00
      6       99.57   57.33    0.415  0.60( 0.59) 0.99    2098.9   20200.00
      7       97.53   58.01    0.412  0.60( 0.59) 0.99    2105.7   20210.00
      8       91.29   61.39    0.400  0.60( 0.59) 0.99    2150.7   20100.00
      9       83.27   68.28    0.386  0.60( 0.59) 0.99    2239.9   13600.00
     10       31.93  187.02    0.243  0.60( 0.58) 0.97    3500.9   13510.00
     11       32.21  196.34    0.239  0.60( 0.58) 0.97    3539.2   13500.00
    TOTAL AREA(ACRES) =      3539.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      130.80  Tc(MIN.) =   45.382
  EFFECTIVE AREA(ACRES) =   1913.43  AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3539.2
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.00  DOWNSTREAM(FEET) =    242.00
```

CHANNEL LENGTH THRU SUBAREA(FEET) = 2860.77 CHANNEL SLOPE = 0.0161
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.430
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.53	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 130.80
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.66
AVERAGE FLOW DEPTH(FEET) = 2.77 TRAVEL TIME(MIN.) = 8.42
Tc(MIN.) = 53.80
SUBAREA AREA(ACRES) = 112.53 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 2025.96 AREA-AVERAGED Fm(INCH/HR) = 0.59
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 3651.8 PEAK FLOW RATE(CFS) = 130.80
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.77 FLOW VELOCITY(FEET/SEC.) = 5.66
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	122.64	30.41	0.582	0.60(0.59)	0.99	1140.4	20700.00
2	121.03	44.44	0.478	0.60(0.59)	0.99	1688.0	20600.00
3	130.80	53.80	0.430	0.60(0.59)	0.99	2026.0	20500.00
4	128.26	58.48	0.410	0.60(0.59)	0.99	2134.9	20400.00
5	121.87	59.79	0.404	0.60(0.59)	0.99	2147.7	20300.00
6	99.57	66.35	0.390	0.60(0.59)	0.99	2211.4	20200.00
7	97.53	67.06	0.388	0.60(0.59)	0.99	2218.3	20210.00
8	91.29	70.60	0.381	0.60(0.59)	0.99	2263.2	20100.00
9	83.27	77.72	0.365	0.60(0.59)	0.99	2352.4	13600.00
10	31.93	199.00	0.238	0.60(0.58)	0.97	3613.5	13510.00
11	32.21	208.34	0.235	0.60(0.58)	0.97	3651.8	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 130.80 Tc(MIN.) = 53.80
AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2025.96

****
FLOW PROCESS FROM NODE 13680.00 TO NODE 13682.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========

PEAK FLOWRATE TABLE FILE NAME: 0610208T.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.86	19.60	0.60(0.60)	0.99	160.7	20810.00
2	18.74	25.44	0.60(0.60)	0.99	185.8	20800.00

TOTAL AREA(ACRES) = 185.8

****
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	122.64	30.41	0.582	0.60(0.59)	0.99	1140.4	20700.00
2	121.03	44.44	0.478	0.60(0.59)	0.99	1688.0	20600.00
3	130.80	53.80	0.430	0.60(0.59)	0.99	2026.0	20500.00
4	128.26	58.48	0.410	0.60(0.59)	0.99	2134.9	20400.00
5	121.87	59.79	0.404	0.60(0.59)	0.99	2147.7	20300.00
6	99.57	66.35	0.390	0.60(0.59)	0.99	2211.4	20200.00
7	97.53	67.06	0.388	0.60(0.59)	0.99	2218.3	20210.00
8	91.29	70.60	0.381	0.60(0.59)	0.99	2263.2	20100.00
9	83.27	77.72	0.365	0.60(0.59)	0.99	2352.4	13600.00
10	31.93	199.00	0.238	0.60(0.58)	0.97	3613.5	13510.00
11	32.21	208.34	0.235	0.60(0.58)	0.97	3651.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.86	19.60	0.775	0.60(0.60)	0.99	160.7	20810.00
2	18.74	25.44	0.653	0.60(0.60)	0.99	185.8	20800.00

LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 13682.00 = 5285.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	131.20	19.60	0.775	0.60(0.59)	0.99	895.7	20810.00
2	133.89	25.44	0.653	0.60(0.59)	0.99	1139.7	20800.00
3	123.62	30.41	0.582	0.60(0.59)	0.99	1326.2	20700.00
4	121.84	44.44	0.478	0.60(0.59)	0.99	1873.8	20600.00
5	131.52	53.80	0.430	0.60(0.59)	0.99	2211.8	20500.00
6	128.95	58.48	0.410	0.60(0.59)	0.99	2320.8	20400.00
7	122.55	59.79	0.404	0.60(0.59)	0.99	2333.6	20300.00
8	100.23	66.35	0.390	0.60(0.59)	0.99	2397.3	20200.00
9	98.19	67.06	0.388	0.60(0.59)	0.99	2404.1	20210.00
10	91.93	70.60	0.381	0.60(0.59)	0.99	2449.0	20100.00
11	83.89	77.72	0.365	0.60(0.59)	0.99	2538.2	13600.00
12	32.34	199.00	0.238	0.60(0.58)	0.97	3799.3	13510.00
13	32.60	208.34	0.235	0.60(0.58)	0.97	3837.6	13500.00

TOTAL AREA(ACRES) = 3837.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 133.89 Tc(MIN.) = 25.437
EFFECTIVE AREA(ACRES) = 1139.66 AREA-AVERAGED Fm(INCH/HR) = 0.59

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  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =     3837.6
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    242.00  DOWNSTREAM(FEET) =    230.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   660.20   CHANNEL SLOPE =  0.0182
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     133.89
  FLOW VELOCITY(FEET/SEC.) =   5.96   FLOW DEPTH(FEET) =   2.74
  TRAVEL TIME(MIN.) =   1.85   Tc(MIN.) =   27.28
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      131.20   21.45    0.732  0.60( 0.59) 0.99     895.7   20810.00
      2      133.89   27.28    0.625  0.60( 0.59) 0.99    1139.7   20800.00
      3      123.62   32.30    0.566  0.60( 0.59) 0.99    1326.2   20700.00
      4      121.84   46.34    0.468  0.60( 0.59) 0.99    1873.8   20600.00
      5      131.52   55.65    0.422  0.60( 0.59) 0.99    2211.8   20500.00
      6      128.95   60.35    0.403  0.60( 0.59) 0.99    2320.8   20400.00
      7      122.55   61.67    0.400  0.60( 0.59) 0.99    2333.6   20300.00
      8      100.23   68.33    0.386  0.60( 0.59) 0.99    2397.3   20200.00
      9       98.19   69.05    0.384  0.60( 0.59) 0.99    2404.1   20210.00
     10       91.93   72.63    0.376  0.60( 0.59) 0.99    2449.0   20100.00
     11       83.89   79.80    0.361  0.60( 0.59) 0.99    2538.2   13600.00
     12       32.34  201.64    0.237  0.60( 0.58) 0.97    3799.3   13510.00
     13       32.60  210.97    0.234  0.60( 0.58) 0.97    3837.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     133.89  Tc(MIN.) =   27.28
  AREA-AVERAGED Fm(INCH/HR) =  0.59  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1139.66

****************************************************************************
  FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610209T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       12.94   22.02  0.60( 0.60) 1.00      76.8   20900.00
    TOTAL AREA(ACRES) =       76.8
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      131.20   21.45    0.732  0.60( 0.59) 0.99     895.7   20810.00
      2      133.89   27.28    0.625  0.60( 0.59) 0.99    1139.7   20800.00
      3      123.62   32.30    0.566  0.60( 0.59) 0.99    1326.2   20700.00
      4      121.84   46.34    0.468  0.60( 0.59) 0.99    1873.8   20600.00
      5      131.52   55.65    0.422  0.60( 0.59) 0.99    2211.8   20500.00
      6      128.95   60.35    0.403  0.60( 0.59) 0.99    2320.8   20400.00
      7      122.55   61.67    0.400  0.60( 0.59) 0.99    2333.6   20300.00
      8      100.23   68.33    0.386  0.60( 0.59) 0.99    2397.3   20200.00
      9       98.19   69.05    0.384  0.60( 0.59) 0.99    2404.1   20210.00
     10       91.93   72.63    0.376  0.60( 0.59) 0.99    2449.0   20100.00
     11       83.89   79.80    0.361  0.60( 0.59) 0.99    2538.2   13600.00
     12       32.34  201.64    0.237  0.60( 0.58) 0.97    3799.3   13510.00
     13       32.60  210.97    0.234  0.60( 0.58) 0.97    3837.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       12.94   22.02    0.721  0.60( 0.60) 1.00      76.8   20900.00
  LONGEST FLOWPATH FROM NODE  20900.00 TO NODE  13682.50 =    4089.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      144.14   21.45    0.732  0.60( 0.59) 0.99     970.5   20810.00
      2      144.40   22.02    0.721  0.60( 0.59) 0.99     996.1   20900.00
      3      136.63   27.28    0.625  0.60( 0.59) 0.99    1216.4   20800.00
      4      123.62   32.30    0.566  0.60( 0.59) 0.99    1403.0   20700.00
      5      121.84   46.34    0.468  0.60( 0.59) 0.99    1950.6   20600.00
      6      131.52   55.65    0.422  0.60( 0.59) 0.99    2288.5   20500.00
      7      128.95   60.35    0.403  0.60( 0.59) 0.99    2397.5   20400.00
      8      122.55   61.67    0.400  0.60( 0.59) 0.99    2410.3   20300.00
      9      100.23   68.33    0.386  0.60( 0.59) 0.99    2474.0   20200.00
     10       98.19   69.05    0.384  0.60( 0.59) 0.99    2480.8   20210.00
     11       91.93   72.63    0.376  0.60( 0.59) 0.99    2525.8   20100.00
     12       83.89   79.80    0.361  0.60( 0.59) 0.99    2615.0   13600.00
     13       32.34  201.64    0.237  0.60( 0.58) 0.97    3876.0   13510.00
     14       32.60  210.97    0.234  0.60( 0.58) 0.97    3914.3   13500.00
    TOTAL AREA(ACRES) =      3914.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      144.40  Tc(MIN.) =   22.018
  EFFECTIVE AREA(ACRES) =    996.12  AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =     3914.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13682.50 TO NODE  13683.00 IS CODE =  51
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    230.00  DOWNSTREAM(FEET) =    208.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1866.20   CHANNEL SLOPE =  0.0115
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.613
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.32      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     144.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.12
  AVERAGE FLOW DEPTH(FEET) =   3.07   TRAVEL TIME(MIN.) =   6.07
  Tc(MIN.) =   28.09
  SUBAREA AREA(ACRES) =    62.32       SUBAREA RUNOFF(CFS) =    0.76
  EFFECTIVE AREA(ACRES) =   1058.44     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3976.6         PEAK FLOW RATE(CFS) =     144.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.07   FLOW VELOCITY(FEET/SEC.) =   5.11
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13683.00 =   38695.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      144.14   27.53    0.622  0.60( 0.59) 0.99    1032.8   20810.00
      2      144.40   28.09    0.613  0.60( 0.59) 0.99    1058.4   20900.00
      3      136.63   33.44    0.557  0.60( 0.59) 0.99    1278.7   20800.00
      4      123.62   38.62    0.515  0.60( 0.59) 0.99    1465.3   20700.00
      5      121.84   52.68    0.435  0.60( 0.59) 0.99    2012.9   20600.00
      6      131.52   61.88    0.399  0.60( 0.59) 0.99    2350.8   20500.00
      7      128.95   66.60    0.389  0.60( 0.59) 0.99    2459.8   20400.00
      8      122.55   68.02    0.386  0.60( 0.59) 0.99    2472.6   20300.00
      9      100.23   75.00    0.371  0.60( 0.59) 0.99    2536.3   20200.00
     10       98.19   75.74    0.370  0.60( 0.59) 0.99    2543.1   20210.00
     11       91.93   79.43    0.362  0.60( 0.59) 0.99    2588.1   20100.00
     12       83.89   86.75    0.346  0.60( 0.59) 0.99    2677.3   13600.00
     13       32.34  210.47    0.234  0.60( 0.58) 0.97    3938.3   13510.00
     14       32.60  219.81    0.230  0.60( 0.58) 0.97    3976.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     144.40  Tc(MIN.) =   28.09
  AREA-AVERAGED Fm(INCH/HR) =  0.59  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1058.44

********************************************************************************
  FLOW PROCESS FROM NODE  13683.00 TO NODE  13684.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    208.53  DOWNSTREAM(FEET) =    200.00
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   166.32   CHANNEL SLOPE =  0.0513
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     144.40
  FLOW VELOCITY(FEET/SEC.) =   8.97   FLOW DEPTH(FEET) =   2.32
  TRAVEL TIME(MIN.) =   0.31   Tc(MIN.) =   28.40
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      144.14   27.84    0.617  0.60( 0.59) 0.99    1032.8   20810.00
      2      144.40   28.40    0.609  0.60( 0.59) 0.99    1058.4   20900.00
      3      136.63   33.76    0.554  0.60( 0.59) 0.99    1278.7   20800.00
      4      123.62   38.94    0.512  0.60( 0.59) 0.99    1465.3   20700.00
      5      121.84   53.01    0.434  0.60( 0.59) 0.99    2012.9   20600.00
      6      131.52   62.20    0.399  0.60( 0.59) 0.99    2350.8   20500.00
      7      128.95   66.92    0.389  0.60( 0.59) 0.99    2459.8   20400.00
      8      122.55   68.34    0.386  0.60( 0.59) 0.99    2472.6   20300.00
      9      100.23   75.34    0.370  0.60( 0.59) 0.99    2536.3   20200.00
     10       98.19   76.08    0.369  0.60( 0.59) 0.99    2543.1   20210.00
     11       91.93   79.78    0.361  0.60( 0.59) 0.99    2588.1   20100.00
     12       83.89   87.11    0.345  0.60( 0.59) 0.99    2677.3   13600.00
     13       32.34  210.92    0.234  0.60( 0.58) 0.97    3938.3   13510.00
     14       32.60  220.26    0.230  0.60( 0.58) 0.97    3976.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     144.40  Tc(MIN.) =   28.40
  AREA-AVERAGED Fm(INCH/HR) =  0.59  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1058.44

********************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE = 15.1
--------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610210T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1        8.60   22.27  0.60( 0.60) 1.00      82.7   21000.00
    TOTAL AREA(ACRES) =       82.7

********************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      144.14   27.84    0.617  0.60( 0.59) 0.99    1032.8   20810.00
```

```
      2      144.40   28.40    0.609  0.60( 0.59) 0.99    1058.4   20900.00
      3      136.63   33.76    0.554  0.60( 0.59) 0.99    1278.7   20800.00
      4      123.62   38.94    0.512  0.60( 0.59) 0.99    1465.3   20700.00
      5      121.84   53.01    0.434  0.60( 0.59) 0.99    2012.9   20600.00
      6      131.52   62.20    0.399  0.60( 0.59) 0.99    2350.8   20500.00
      7      128.95   66.92    0.389  0.60( 0.59) 0.99    2459.8   20400.00
      8      122.55   68.34    0.386  0.60( 0.59) 0.99    2472.6   20300.00
      9      100.23   75.34    0.370  0.60( 0.59) 0.99    2536.3   20200.00
     10       98.19   76.08    0.369  0.60( 0.59) 0.99    2543.1   20210.00
     11       91.93   79.78    0.361  0.60( 0.59) 0.99    2588.1   20100.00
     12       83.89   87.11    0.345  0.60( 0.59) 0.99    2677.3   13600.00
     13       32.34  210.92    0.234  0.60( 0.58) 0.97    3938.3   13510.00
     14       32.60  220.26    0.230  0.60( 0.58) 0.97    3976.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        8.60   22.27    0.715  0.60( 0.60) 1.00      82.7   21000.00
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  13684.00 =    4160.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      152.74   22.27    0.715  0.60( 0.59) 0.99     909.2   21000.00
      2      145.43   27.84    0.617  0.60( 0.59) 0.99    1115.5   20810.00
      3      145.07   28.40    0.609  0.60( 0.59) 0.99    1141.1   20900.00
      4      136.63   33.76    0.554  0.60( 0.59) 0.99    1361.4   20800.00
      5      123.62   38.94    0.512  0.60( 0.59) 0.99    1548.0   20700.00
      6      121.84   53.01    0.434  0.60( 0.59) 0.99    2095.6   20600.00
      7      131.52   62.20    0.399  0.60( 0.59) 0.99    2433.6   20500.00
      8      128.95   66.92    0.389  0.60( 0.59) 0.99    2542.5   20400.00
      9      122.55   68.34    0.386  0.60( 0.59) 0.99    2555.3   20300.00
     10      100.23   75.34    0.370  0.60( 0.59) 0.99    2619.0   20200.00
     11       98.19   76.08    0.369  0.60( 0.59) 0.99    2625.9   20210.00
     12       91.93   79.78    0.361  0.60( 0.59) 0.99    2670.8   20100.00
     13       83.89   87.11    0.345  0.60( 0.59) 0.99    2760.0   13600.00
     14       32.34  210.92    0.234  0.60( 0.58) 0.97    4021.1   13510.00
     15       32.60  220.26    0.230  0.60( 0.58) 0.97    4059.3   13500.00
    TOTAL AREA(ACRES) =      4059.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      152.74  Tc(MIN.) =   22.275
  EFFECTIVE AREA(ACRES) =    909.15  AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =     4059.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13685.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    200.00  DOWNSTREAM(FEET) =    194.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   122.69   CHANNEL SLOPE =  0.0469
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
```



```
  CHANNEL FLOW THRU SUBAREA(CFS) =     152.74
  FLOW VELOCITY(FEET/SEC.) =   8.79   FLOW DEPTH(FEET) =   2.41
  TRAVEL TIME(MIN.) =   0.23   Tc(MIN.) =   22.51
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13685.00 =   38984.01 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      152.74   22.51    0.711  0.60( 0.59) 0.99     909.2   21000.00
      2      145.43   28.07    0.614  0.60( 0.59) 0.99    1115.5   20810.00
      3      145.07   28.64    0.605  0.60( 0.59) 0.99    1141.1   20900.00
      4      136.63   34.00    0.553  0.60( 0.59) 0.99    1361.4   20800.00
      5      123.62   39.19    0.510  0.60( 0.59) 0.99    1548.0   20700.00
      6      121.84   53.25    0.433  0.60( 0.59) 0.99    2095.6   20600.00
      7      131.52   62.44    0.398  0.60( 0.59) 0.99    2433.6   20500.00
      8      128.95   67.16    0.388  0.60( 0.59) 0.99    2542.5   20400.00
      9      122.55   68.59    0.385  0.60( 0.59) 0.99    2555.3   20300.00
     10      100.23   75.59    0.370  0.60( 0.59) 0.99    2619.0   20200.00
     11       98.19   76.34    0.368  0.60( 0.59) 0.99    2625.9   20210.00
     12       91.93   80.04    0.360  0.60( 0.59) 0.99    2670.8   20100.00
     13       83.89   87.38    0.345  0.60( 0.59) 0.99    2760.0   13600.00
     14       32.34  211.27    0.234  0.60( 0.58) 0.97    4021.1   13510.00
     15       32.60  220.60    0.230  0.60( 0.58) 0.97    4059.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     152.74  Tc(MIN.) =   22.51
  AREA-AVERAGED Fm(INCH/HR) =  0.59  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =     909.15

****************************************************************************
  FLOW PROCESS FROM NODE  13685.00 TO NODE  13410.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    194.24  DOWNSTREAM(FEET) =    178.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1843.57   CHANNEL SLOPE =  0.0084
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.597
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.39      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     152.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.61
  AVERAGE FLOW DEPTH(FEET) =   3.32   TRAVEL TIME(MIN.) =   6.66
  Tc(MIN.) =   29.17
  SUBAREA AREA(ACRES) =     8.39       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    917.54     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     4067.7         PEAK FLOW RATE(CFS) =     152.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.32 FLOW VELOCITY(FEET/SEC.) = 4.61
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	152.74	29.17	0.597	0.60(0.59)	0.99	917.5	21000.00
2	145.43	34.81	0.546	0.60(0.59)	0.99	1123.9	20810.00
3	145.07	35.39	0.541	0.60(0.59)	0.99	1149.5	20900.00
4	136.63	40.84	0.499	0.60(0.59)	0.99	1369.8	20800.00
5	123.62	46.22	0.468	0.60(0.59)	0.99	1556.4	20700.00
6	121.84	60.29	0.403	0.60(0.59)	0.99	2104.0	20600.00
7	131.52	69.35	0.383	0.60(0.59)	0.99	2441.9	20500.00
8	128.95	74.11	0.373	0.60(0.59)	0.99	2550.9	20400.00
9	122.55	75.61	0.370	0.60(0.59)	0.99	2563.7	20300.00
10	100.23	82.99	0.354	0.60(0.59)	0.99	2627.4	20200.00
11	98.19	83.76	0.352	0.60(0.59)	0.99	2634.2	20210.00
12	91.93	87.59	0.344	0.60(0.59)	0.99	2679.2	20100.00
13	83.89	95.10	0.331	0.60(0.59)	0.99	2768.4	13600.00
14	32.34	221.10	0.230	0.60(0.58)	0.97	4029.4	13510.00
15	32.60	230.37	0.227	0.60(0.58)	0.97	4067.7	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 152.74 Tc(MIN.) = 29.17
AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 917.54

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 4067.7 TC(MIN.) = 29.17
EFFECTIVE AREA(ACRES) = 917.54 AREA-AVERAGED Fm(INCH/HR)= 0.59
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.990
PEAK FLOW RATE(CFS) = 152.74

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	152.74	29.17	0.597	0.60(0.59)	0.99	917.5	21000.00
2	145.43	34.81	0.546	0.60(0.59)	0.99	1123.9	20810.00
3	145.07	35.39	0.541	0.60(0.59)	0.99	1149.5	20900.00
4	136.63	40.84	0.499	0.60(0.59)	0.99	1369.8	20800.00
5	123.62	46.22	0.468	0.60(0.59)	0.99	1556.4	20700.00
6	121.84	60.29	0.403	0.60(0.59)	0.99	2104.0	20600.00
7	131.52	69.35	0.383	0.60(0.59)	0.99	2441.9	20500.00
8	128.95	74.11	0.373	0.60(0.59)	0.99	2550.9	20400.00
9	122.55	75.61	0.370	0.60(0.59)	0.99	2563.7	20300.00
10	100.23	82.99	0.354	0.60(0.59)	0.99	2627.4	20200.00
11	98.19	83.76	0.352	0.60(0.59)	0.99	2634.2	20210.00
12	91.93	87.59	0.344	0.60(0.59)	0.99	2679.2	20100.00
13	83.89	95.10	0.331	0.60(0.59)	0.99	2768.4	13600.00
14	32.34	221.10	0.230	0.60(0.58)	0.97	4029.4	13510.00
15	32.60	230.37	0.227	0.60(0.58)	0.97	4067.7	13500.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S37.DAT
  TIME/DATE OF STUDY: 08:02 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.802
   2)   10.00;  1.202
   3)   15.00;  0.923
   4)   20.00;  0.761
   5)   25.00;  0.659
   6)   30.00;  0.585
   7)   40.00;  0.503
   8)   50.00;  0.446
   9)   60.00;  0.403
  10)   90.00;  0.338
  11)  120.00;  0.294
  12)  180.00;  0.244
  13)  360.00;  0.178
  14) 1440.00;  0.078
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S34.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1     1205.11   29.80  0.60( 0.59) 0.98    3461.7   21000.00
      2     1180.16   46.85  0.60( 0.59) 0.98    6283.3   20700.00
      3     1296.56   67.40  0.60( 0.58) 0.98   10910.6   30100.00
      4     1124.12   83.63  0.60( 0.58) 0.97   14490.0   20200.00
      5     1049.19   95.76  0.60( 0.58) 0.96   17048.8   13600.00
      6      967.92  113.64  0.60( 0.58) 0.96   20790.3   13200.00
      7     1007.89  136.01  0.60( 0.58) 0.96   25043.0   11831.00
      8     1097.80  158.60  0.60( 0.58) 0.96   29512.9   11530.00
      9     1160.26  177.65  0.60( 0.58) 0.96   33860.4   11000.00
     10     1246.80  199.42  0.60( 0.58) 0.97   40869.5   10850.00
     11     1159.54  215.48  0.60( 0.58) 0.97   44377.8   11220.00
     12      926.33  268.67  0.60( 0.58) 0.97   52817.9   12410.00
     13      874.72  301.90  0.60( 0.58) 0.97   58896.1   12261.00
     14      857.00  314.89  0.60( 0.58) 0.98   60380.9   10410.00
     15      839.80  327.16  0.60( 0.59) 0.98   61486.7   12101.10
     16      801.02  354.80  0.60( 0.59) 0.98   63864.5   10200.00
     17      781.81  368.31  0.60( 0.59) 0.98   64804.1   12010.00
     18      738.54  398.01  0.60( 0.59) 0.98   65481.5   10210.00
     19      677.54  447.74  0.60( 0.59) 0.98   65983.2   12000.00
     20      636.26  515.18  0.60( 0.59) 0.98   66551.6   10100.00
   TOTAL AREA(ACRES) =    66551.6

**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1     1205.11   29.80  0.60( 0.59) 0.98    3461.7   21000.00
      2     1180.16   46.85  0.60( 0.59) 0.98    6283.3   20700.00
      3     1296.56   67.40  0.60( 0.58) 0.98   10910.6   30100.00
      4     1124.12   83.63  0.60( 0.58) 0.97   14490.0   20200.00
      5     1049.19   95.76  0.60( 0.58) 0.96   17048.8   13600.00
      6      967.92  113.64  0.60( 0.58) 0.96   20790.3   13200.00
      7     1007.89  136.01  0.60( 0.58) 0.96   25043.0   11831.00
      8     1097.80  158.60  0.60( 0.58) 0.96   29512.9   11530.00
      9     1160.26  177.65  0.60( 0.58) 0.96   33860.4   11000.00
     10     1246.80  199.42  0.60( 0.58) 0.97   40869.5   10850.00
     11     1159.54  215.48  0.60( 0.58) 0.97   44377.8   11220.00
     12      926.33  268.67  0.60( 0.58) 0.97   52817.9   12410.00
     13      874.72  301.90  0.60( 0.58) 0.97   58896.1   12261.00
     14      857.00  314.89  0.60( 0.58) 0.98   60380.9   10410.00
     15      839.80  327.16  0.60( 0.59) 0.98   61486.7   12101.10
     16      801.02  354.80  0.60( 0.59) 0.98   63864.5   10200.00
     17      781.81  368.31  0.60( 0.59) 0.98   64804.1   12010.00
     18      738.54  398.01  0.60( 0.59) 0.98   65481.5   10210.00
```

```
     19      677.54  447.74  0.60( 0.59) 0.98   65983.2   12000.00
     20      636.26  515.18  0.60( 0.59) 0.98   66551.6   10100.00
    TOTAL AREA(ACRES) =     66551.6

****************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13701.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    167.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.11   CHANNEL SLOPE =  0.0015
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1296.56
  FLOW VELOCITY(FEET/SEC.) =   5.08   FLOW DEPTH(FEET) =   9.22
  TRAVEL TIME(MIN.) =   5.57   Tc(MIN.) =   72.97
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1205.11   35.48    0.540  0.60( 0.59) 0.98    3461.7   21000.00
      2     1180.16   52.56    0.435  0.60( 0.59) 0.98    6283.3   20700.00
      3     1296.56   72.97    0.375  0.60( 0.58) 0.98   10910.6   30100.00
      4     1124.12   89.41    0.339  0.60( 0.58) 0.97   14490.0   20200.00
      5     1049.19  101.64    0.321  0.60( 0.58) 0.96   17048.8   13600.00
      6      967.92  119.63    0.295  0.60( 0.58) 0.96   20790.3   13200.00
      7     1007.89  141.94    0.276  0.60( 0.58) 0.96   25043.0   11831.00
      8     1097.80  164.41    0.257  0.60( 0.58) 0.96   29512.9   11530.00
      9     1160.26  183.37    0.243  0.60( 0.58) 0.96   33860.4   11000.00
     10     1246.80  205.05    0.235  0.60( 0.58) 0.97   40869.5   10850.00
     11     1159.54  221.21    0.229  0.60( 0.58) 0.97   44377.8   11220.00
     12      926.33  274.73    0.209  0.60( 0.58) 0.97   52817.9   12410.00
     13      874.72  308.04    0.197  0.60( 0.58) 0.97   58896.1   12261.00
     14      857.00  321.07    0.192  0.60( 0.58) 0.98   60380.9   10410.00
     15      839.80  333.38    0.188  0.60( 0.59) 0.98   61486.7   12101.10
     16      801.02  361.09    0.178  0.60( 0.59) 0.98   63864.5   10200.00
     17      781.81  374.63    0.177  0.60( 0.59) 0.98   64804.1   12010.00
     18      738.54  404.43    0.174  0.60( 0.59) 0.98   65481.5   10210.00
     19      677.54  454.30    0.169  0.60( 0.59) 0.98   65983.2   12000.00
     20      636.26  521.84    0.163  0.60( 0.59) 0.98   66551.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1296.56  Tc(MIN.) =   72.97
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10910.58

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
```



```
  PEAK FLOWRATE TABLE FILE NAME: 0509102T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       17.41   29.68  0.60( 0.52) 0.87     167.7   10200.00
    TOTAL AREA(ACRES) =      167.7

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1205.11   35.48    0.540  0.60( 0.59) 0.98    3461.7   21000.00
      2     1180.16   52.56    0.435  0.60( 0.59) 0.98    6283.3   20700.00
      3     1296.56   72.97    0.375  0.60( 0.58) 0.98   10910.6   30100.00
      4     1124.12   89.41    0.339  0.60( 0.58) 0.97   14490.0   20200.00
      5     1049.19  101.64    0.321  0.60( 0.58) 0.96   17048.8   13600.00
      6      967.92  119.63    0.295  0.60( 0.58) 0.96   20790.3   13200.00
      7     1007.89  141.94    0.276  0.60( 0.58) 0.96   25043.0   11831.00
      8     1097.80  164.41    0.257  0.60( 0.58) 0.96   29512.9   11530.00
      9     1160.26  183.37    0.243  0.60( 0.58) 0.96   33860.4   11000.00
     10     1246.80  205.05    0.235  0.60( 0.58) 0.97   40869.5   10850.00
     11     1159.54  221.21    0.229  0.60( 0.58) 0.97   44377.8   11220.00
     12      926.33  274.73    0.209  0.60( 0.58) 0.97   52817.9   12410.00
     13      874.72  308.04    0.197  0.60( 0.58) 0.97   58896.1   12261.00
     14      857.00  321.07    0.192  0.60( 0.58) 0.98   60380.9   10410.00
     15      839.80  333.38    0.188  0.60( 0.59) 0.98   61486.7   12101.10
     16      801.02  361.09    0.178  0.60( 0.59) 0.98   63864.5   10200.00
     17      781.81  374.63    0.177  0.60( 0.59) 0.98   64804.1   12010.00
     18      738.54  404.43    0.174  0.60( 0.59) 0.98   65481.5   10210.00
     19      677.54  454.30    0.169  0.60( 0.59) 0.98   65983.2   12000.00
     20      636.26  521.84    0.163  0.60( 0.59) 0.98   66551.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       17.41   29.68    0.590  0.60( 0.52) 0.87     167.7   10200.00
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  13701.00 =    9099.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1118.23   29.68    0.590  0.60( 0.59) 0.98    3063.3   10200.00
      2     1221.05   35.48    0.540  0.60( 0.59) 0.98    3629.3   21000.00
      3     1193.01   52.56    0.435  0.60( 0.59) 0.98    6451.0   20700.00
      4     1307.63   72.97    0.375  0.60( 0.58) 0.97   11078.2   30100.00
      5     1134.14   89.41    0.339  0.60( 0.58) 0.97   14657.6   20200.00
      6     1058.67  101.64    0.321  0.60( 0.58) 0.96   17216.5   13600.00
      7      976.62  119.63    0.295  0.60( 0.58) 0.96   20958.0   13200.00
      8     1016.03  141.94    0.276  0.60( 0.57) 0.96   25210.7   11831.00
      9     1105.38  164.41    0.257  0.60( 0.58) 0.96   29680.5   11530.00
     10     1167.43  183.37    0.243  0.60( 0.58) 0.96   34028.0   11000.00
     11     1253.73  205.05    0.235  0.60( 0.58) 0.97   41037.2   10850.00
```

```
    12     1166.30  221.21    0.229  0.60( 0.58) 0.97   44545.4   11220.00
    13      932.50  274.73    0.209  0.60( 0.58) 0.97   52985.5   12410.00
    14      880.53  308.04    0.197  0.60( 0.58) 0.97   59063.8   12261.00
    15      862.68  321.07    0.192  0.60( 0.58) 0.98   60548.6   10410.00
    16      845.35  333.38    0.188  0.60( 0.59) 0.98   61654.3   12101.10
    17      806.27  361.09    0.178  0.60( 0.59) 0.98   64032.1   10200.00
    18      787.02  374.63    0.177  0.60( 0.59) 0.98   64971.8   12010.00
    19      743.67  404.43    0.174  0.60( 0.59) 0.98   65649.2   10210.00
    20      682.54  454.30    0.169  0.60( 0.59) 0.98   66150.9   12000.00
    21      641.08  521.84    0.163  0.60( 0.59) 0.98   66719.3   10100.00
  TOTAL AREA(ACRES) =     66719.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1307.63  Tc(MIN.) =   72.967
 EFFECTIVE AREA(ACRES) =  11078.25  AREA-AVERAGED Fm(INCH/HR) =  0.58
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.98
 TOTAL AREA(ACRES) =    66719.3
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13701.00 TO NODE  13720.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    165.51
 CHANNEL LENGTH THRU SUBAREA(FEET) =   192.72   CHANNEL SLOPE =  0.0103
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 CHANNEL FLOW THRU SUBAREA(CFS) =    1307.63
 FLOW VELOCITY(FEET/SEC.) =  10.58   FLOW DEPTH(FEET) =   6.42
 TRAVEL TIME(MIN.) =   0.30   Tc(MIN.) =   73.27
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13720.00 =  126443.80 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1118.23   29.99    0.585  0.60( 0.59) 0.98    3063.3   10200.00
     2     1221.05   35.79    0.538  0.60( 0.59) 0.98    3629.3   21000.00
     3     1193.01   52.87    0.434  0.60( 0.59) 0.98    6451.0   20700.00
     4     1307.63   73.27    0.374  0.60( 0.58) 0.97   11078.2   30100.00
     5     1134.14   89.72    0.339  0.60( 0.58) 0.97   14657.6   20200.00
     6     1058.67  101.96    0.320  0.60( 0.58) 0.96   17216.5   13600.00
     7      976.62  119.96    0.294  0.60( 0.58) 0.96   20958.0   13200.00
     8     1016.03  142.27    0.275  0.60( 0.57) 0.96   25210.7   11831.00
     9     1105.38  164.72    0.257  0.60( 0.58) 0.96   29680.5   11530.00
    10     1167.43  183.69    0.243  0.60( 0.58) 0.96   34028.0   11000.00
    11     1253.73  205.36    0.235  0.60( 0.58) 0.97   41037.2   10850.00
    12     1166.30  221.52    0.229  0.60( 0.58) 0.97   44545.4   11220.00
    13      932.50  275.06    0.209  0.60( 0.58) 0.97   52985.5   12410.00
    14      880.53  308.38    0.197  0.60( 0.58) 0.97   59063.8   12261.00
    15      862.68  321.40    0.192  0.60( 0.58) 0.98   60548.6   10410.00
    16      845.35  333.72    0.188  0.60( 0.59) 0.98   61654.3   12101.10
    17      806.27  361.43    0.178  0.60( 0.59) 0.98   64032.1   10200.00
    18      787.02  374.97    0.177  0.60( 0.59) 0.98   64971.8   12010.00
    19      743.67  404.78    0.174  0.60( 0.59) 0.98   65649.2   10210.00
    20      682.54  454.65    0.169  0.60( 0.59) 0.98   66150.9   12000.00
    21      641.08  522.20    0.163  0.60( 0.59) 0.98   66719.3   10100.00
```



```
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1307.63  Tc(MIN.) =   73.27
 AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   11078.25

****************************************************************************
 FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    165.51  DOWNSTREAM(FEET) =    161.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2042.40   CHANNEL SLOPE =  0.0019
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 CHANNEL FLOW THRU SUBAREA(CFS) =    1307.63
 FLOW VELOCITY(FEET/SEC.) =   5.61   FLOW DEPTH(FEET) =   8.82
 TRAVEL TIME(MIN.) =   6.07   Tc(MIN.) =   79.34
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1118.23   36.30    0.533  0.60( 0.59) 0.98    3063.3   10200.00
     2     1221.05   41.97    0.492  0.60( 0.59) 0.98    3629.3   21000.00
     3     1193.01   59.08    0.407  0.60( 0.59) 0.98    6451.0   20700.00
     4     1307.63   79.34    0.361  0.60( 0.58) 0.97   11078.2   30100.00
     5     1134.14   96.01    0.329  0.60( 0.58) 0.97   14657.6   20200.00
     6     1058.67  108.36    0.311  0.60( 0.58) 0.96   17216.5   13600.00
     7      976.62  126.50    0.289  0.60( 0.58) 0.96   20958.0   13200.00
     8     1016.03  148.73    0.270  0.60( 0.57) 0.96   25210.7   11831.00
     9     1105.38  171.06    0.251  0.60( 0.58) 0.96   29680.5   11530.00
    10     1167.43  189.93    0.240  0.60( 0.58) 0.96   34028.0   11000.00
    11     1253.73  211.50    0.232  0.60( 0.58) 0.97   41037.2   10850.00
    12     1166.30  227.77    0.226  0.60( 0.58) 0.97   44545.4   11220.00
    13      932.50  281.67    0.207  0.60( 0.58) 0.97   52985.5   12410.00
    14      880.53  315.09    0.194  0.60( 0.58) 0.97   59063.8   12261.00
    15      862.68  328.14    0.190  0.60( 0.58) 0.98   60548.6   10410.00
    16      845.35  340.49    0.185  0.60( 0.59) 0.98   61654.3   12101.10
    17      806.27  368.28    0.177  0.60( 0.59) 0.98   64032.1   10200.00
    18      787.02  381.87    0.176  0.60( 0.59) 0.98   64971.8   12010.00
    19      743.67  411.77    0.173  0.60( 0.59) 0.98   65649.2   10210.00
    20      682.54  461.80    0.169  0.60( 0.59) 0.98   66150.9   12000.00
    21      641.08  529.46    0.162  0.60( 0.59) 0.98   66719.3   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1307.63  Tc(MIN.) =   79.34
 AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   11078.25

****************************************************************************
 FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE = 15.1
----------------------------------------------------------------------------
```

```
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509103T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)           (ACRES)     NODE
      1       35.43   32.96  0.60( 0.57) 0.95      474.8   10300.00
    TOTAL AREA(ACRES) =      474.8

********************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     1118.23   36.30    0.533  0.60( 0.59) 0.98    3063.3   10200.00
      2     1221.05   41.97    0.492  0.60( 0.59) 0.98    3629.3   21000.00
      3     1193.01   59.08    0.407  0.60( 0.59) 0.98    6451.0   20700.00
      4     1307.63   79.34    0.361  0.60( 0.58) 0.97   11078.2   30100.00
      5     1134.14   96.01    0.329  0.60( 0.58) 0.97   14657.6   20200.00
      6     1058.67  108.36    0.311  0.60( 0.58) 0.96   17216.5   13600.00
      7      976.62  126.50    0.289  0.60( 0.58) 0.96   20958.0   13200.00
      8     1016.03  148.73    0.270  0.60( 0.57) 0.96   25210.7   11831.00
      9     1105.38  171.06    0.251  0.60( 0.58) 0.96   29680.5   11530.00
     10     1167.43  189.93    0.240  0.60( 0.58) 0.96   34028.0   11000.00
     11     1253.73  211.50    0.232  0.60( 0.58) 0.97   41037.2   10850.00
     12     1166.30  227.77    0.226  0.60( 0.58) 0.97   44545.4   11220.00
     13      932.50  281.67    0.207  0.60( 0.58) 0.97   52985.5   12410.00
     14      880.53  315.09    0.194  0.60( 0.58) 0.97   59063.8   12261.00
     15      862.68  328.14    0.190  0.60( 0.58) 0.98   60548.6   10410.00
     16      845.35  340.49    0.185  0.60( 0.59) 0.98   61654.3   12101.10
     17      806.27  368.28    0.177  0.60( 0.59) 0.98   64032.1   10200.00
     18      787.02  381.87    0.176  0.60( 0.59) 0.98   64971.8   12010.00
     19      743.67  411.77    0.173  0.60( 0.59) 0.98   65649.2   10210.00
     20      682.54  461.80    0.169  0.60( 0.59) 0.98   66150.9   12000.00
     21      641.08  529.46    0.162  0.60( 0.59) 0.98   66719.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1       35.43   32.96    0.561  0.60( 0.57) 0.95      474.8   10300.00
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  13740.00 =    8072.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     1102.80   32.96    0.561  0.60( 0.58) 0.97    3255.6   10300.00
      2     1151.93   36.30    0.533  0.60( 0.58) 0.97    3538.1   10200.00
      3     1252.13   41.97    0.492  0.60( 0.58) 0.97    4104.1   21000.00
      4     1218.72   59.08    0.407  0.60( 0.58) 0.97    6925.7   20700.00
      5     1330.45   79.34    0.361  0.60( 0.58) 0.97   11553.0   30100.00
      6     1154.94   96.01    0.329  0.60( 0.58) 0.97   15132.4   20200.00
      7     1078.32  108.36    0.311  0.60( 0.58) 0.96   17691.3   13600.00
      8      994.85  126.50    0.289  0.60( 0.57) 0.96   21432.8   13200.00
```



```
      9     1033.09  148.73    0.270  0.60( 0.57) 0.96   25685.4   11831.00
     10     1121.27  171.06    0.251  0.60( 0.58) 0.96   30155.3   11530.00
     11     1182.61  189.93    0.240  0.60( 0.58) 0.96   34502.8   11000.00
     12     1268.42  211.50    0.232  0.60( 0.58) 0.97   41512.0   10850.00
     13     1180.61  227.77    0.226  0.60( 0.58) 0.97   45020.2   11220.00
     14      945.57  281.67    0.207  0.60( 0.58) 0.97   53460.3   12410.00
     15      892.82  315.09    0.194  0.60( 0.58) 0.97   59538.6   12261.00
     16      874.66  328.14    0.190  0.60( 0.58) 0.97   61023.3   10410.00
     17      857.05  340.49    0.185  0.60( 0.58) 0.98   62129.1   12101.10
     18      817.47  368.28    0.177  0.60( 0.59) 0.98   64506.9   10200.00
     19      798.14  381.87    0.176  0.60( 0.59) 0.98   65446.5   12010.00
     20      754.62  411.77    0.173  0.60( 0.59) 0.98   66124.0   10210.00
     21      693.19  461.80    0.169  0.60( 0.59) 0.98   66625.7   12000.00
     22      651.33  529.46    0.162  0.60( 0.59) 0.98   67194.1   10100.00
   TOTAL AREA(ACRES) =     67194.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1330.45  Tc(MIN.) =   79.342
  EFFECTIVE AREA(ACRES) =  11553.00  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67194.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13741.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    161.63  DOWNSTREAM(FEET) =    141.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   389.20   CHANNEL SLOPE =  0.0530
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1330.45
  FLOW VELOCITY(FEET/SEC.) =  19.61   FLOW DEPTH(FEET) =   4.76
  TRAVEL TIME(MIN.) =   0.33   Tc(MIN.) =   79.67
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13741.00 =  128875.40 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     1102.80   33.30    0.558  0.60( 0.58) 0.97    3255.6   10300.00
      2     1151.93   36.65    0.530  0.60( 0.58) 0.97    3538.1   10200.00
      3     1252.13   42.30    0.490  0.60( 0.58) 0.97    4104.1   21000.00
      4     1218.72   59.42    0.406  0.60( 0.58) 0.97    6925.7   20700.00
      5     1330.45   79.67    0.360  0.60( 0.58) 0.97   11553.0   30100.00
      6     1154.94   96.36    0.329  0.60( 0.58) 0.97   15132.4   20200.00
      7     1078.32  108.70    0.311  0.60( 0.58) 0.96   17691.3   13600.00
      8      994.85  126.85    0.288  0.60( 0.57) 0.96   21432.8   13200.00
      9     1033.09  149.09    0.270  0.60( 0.57) 0.96   25685.4   11831.00
     10     1121.27  171.40    0.251  0.60( 0.58) 0.96   30155.3   11530.00
     11     1182.61  190.27    0.240  0.60( 0.58) 0.96   34502.8   11000.00
     12     1268.42  211.83    0.232  0.60( 0.58) 0.97   41512.0   10850.00
     13     1180.61  228.11    0.226  0.60( 0.58) 0.97   45020.2   11220.00
     14      945.57  282.03    0.207  0.60( 0.58) 0.97   53460.3   12410.00
     15      892.82  315.45    0.194  0.60( 0.58) 0.97   59538.6   12261.00
     16      874.66  328.51    0.190  0.60( 0.58) 0.97   61023.3   10410.00
     17      857.05  340.86    0.185  0.60( 0.58) 0.98   62129.1   12101.10
```

```
    18      817.47  368.66    0.177  0.60( 0.59) 0.98   64506.9   10200.00
    19      798.14  382.24    0.176  0.60( 0.59) 0.98   65446.5   12010.00
    20      754.62  412.15    0.173  0.60( 0.59) 0.98   66124.0   10210.00
    21      693.19  462.19    0.169  0.60( 0.59) 0.98   66625.7   12000.00
    22      651.33  529.85    0.162  0.60( 0.59) 0.98   67194.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1330.45  Tc(MIN.) =   79.67
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   11553.00

****************************************************************************
  FLOW PROCESS FROM NODE  13741.00 TO NODE  13802.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    141.00  DOWNSTREAM(FEET) =    135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1533.41   CHANNEL SLOPE =  0.0039
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1330.45
  FLOW VELOCITY(FEET/SEC.) =   7.39   FLOW DEPTH(FEET) =   7.75
  TRAVEL TIME(MIN.) =   3.46   Tc(MIN.) =   83.13
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1102.80   36.93    0.528  0.60( 0.58) 0.97    3255.6   10300.00
      2     1151.93   40.24    0.502  0.60( 0.58) 0.97    3538.1   10200.00
      3     1252.13   45.82    0.470  0.60( 0.58) 0.97    4104.1   21000.00
      4     1218.72   62.96    0.397  0.60( 0.58) 0.97    6925.7   20700.00
      5     1330.45   83.13    0.353  0.60( 0.58) 0.97   11553.0   30100.00
      6     1154.94   99.94    0.323  0.60( 0.58) 0.97   15132.4   20200.00
      7     1078.32  112.35    0.305  0.60( 0.58) 0.96   17691.3   13600.00
      8      994.85  130.58    0.285  0.60( 0.57) 0.96   21432.8   13200.00
      9     1033.09  152.78    0.267  0.60( 0.57) 0.96   25685.4   11831.00
     10     1121.27  175.01    0.248  0.60( 0.58) 0.96   30155.3   11530.00
     11     1182.61  193.84    0.239  0.60( 0.58) 0.96   34502.8   11000.00
     12     1268.42  215.33    0.231  0.60( 0.58) 0.97   41512.0   10850.00
     13     1180.61  231.68    0.225  0.60( 0.58) 0.97   45020.2   11220.00
     14      945.57  285.80    0.205  0.60( 0.58) 0.97   53460.3   12410.00
     15      892.82  319.27    0.193  0.60( 0.58) 0.97   59538.6   12261.00
     16      874.66  332.35    0.188  0.60( 0.58) 0.97   61023.3   10410.00
     17      857.05  344.73    0.184  0.60( 0.58) 0.98   62129.1   12101.10
     18      817.47  372.57    0.177  0.60( 0.59) 0.98   64506.9   10200.00
     19      798.14  386.18    0.176  0.60( 0.59) 0.98   65446.5   12010.00
     20      754.62  416.14    0.173  0.60( 0.59) 0.98   66124.0   10210.00
     21      693.19  466.26    0.168  0.60( 0.59) 0.98   66625.7   12000.00
     22      651.33  533.99    0.162  0.60( 0.59) 0.98   67194.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1330.45  Tc(MIN.) =   83.13
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   11553.00

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  12
----------------------------------------------------------------------------
```



```
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509104T.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)           (ACRES)    NODE
      1       13.76   57.28  0.60( 0.56) 0.94     599.8   10400.00
    TOTAL AREA(ACRES) =      599.8

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     1102.80   36.93    0.528  0.60( 0.58) 0.97    3255.6   10300.00
      2     1151.93   40.24    0.502  0.60( 0.58) 0.97    3538.1   10200.00
      3     1252.13   45.82    0.470  0.60( 0.58) 0.97    4104.1   21000.00
      4     1218.72   62.96    0.397  0.60( 0.58) 0.97    6925.7   20700.00
      5     1330.45   83.13    0.353  0.60( 0.58) 0.97   11553.0   30100.00
      6     1154.94   99.94    0.323  0.60( 0.58) 0.97   15132.4   20200.00
      7     1078.32  112.35    0.305  0.60( 0.58) 0.96   17691.3   13600.00
      8      994.85  130.58    0.285  0.60( 0.57) 0.96   21432.8   13200.00
      9     1033.09  152.78    0.267  0.60( 0.57) 0.96   25685.4   11831.00
     10     1121.27  175.01    0.248  0.60( 0.58) 0.96   30155.3   11530.00
     11     1182.61  193.84    0.239  0.60( 0.58) 0.96   34502.8   11000.00
     12     1268.42  215.33    0.231  0.60( 0.58) 0.97   41512.0   10850.00
     13     1180.61  231.68    0.225  0.60( 0.58) 0.97   45020.2   11220.00
     14      945.57  285.80    0.205  0.60( 0.58) 0.97   53460.3   12410.00
     15      892.82  319.27    0.193  0.60( 0.58) 0.97   59538.6   12261.00
     16      874.66  332.35    0.188  0.60( 0.58) 0.97   61023.3   10410.00
     17      857.05  344.73    0.184  0.60( 0.58) 0.98   62129.1   12101.10
     18      817.47  372.57    0.177  0.60( 0.59) 0.98   64506.9   10200.00
     19      798.14  386.18    0.176  0.60( 0.59) 0.98   65446.5   12010.00
     20      754.62  416.14    0.173  0.60( 0.59) 0.98   66124.0   10210.00
     21      693.19  466.26    0.168  0.60( 0.59) 0.98   66625.7   12000.00
     22      651.33  533.99    0.162  0.60( 0.59) 0.98   67194.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1       13.76   57.28    0.415  0.60( 0.56) 0.94     599.8   10400.00
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  13802.00 =   12273.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     1114.10   36.93    0.528  0.60( 0.58) 0.97    3642.3   10300.00
```

2	1163.62	40.24	0.502	0.60(0.58)	0.97	3959.4	10200.00
3	1264.59	45.82	0.470	0.60(0.58)	0.97	4583.8	21000.00
4	1243.54	57.28	0.415	0.60(0.58)	0.97	6590.7	10400.00
5	1231.88	62.96	0.397	0.60(0.58)	0.97	7525.5	20700.00
6	1342.15	83.13	0.353	0.60(0.58)	0.97	12152.8	30100.00
7	1165.67	99.94	0.323	0.60(0.58)	0.97	15732.2	20200.00
8	1088.45	112.35	0.305	0.60(0.58)	0.96	18291.1	13600.00
9	1004.31	130.58	0.285	0.60(0.57)	0.96	22032.5	13200.00
10	1041.94	152.78	0.267	0.60(0.57)	0.96	26285.2	11831.00
11	1129.50	175.01	0.248	0.60(0.58)	0.96	30755.1	11530.00
12	1190.54	193.84	0.239	0.60(0.58)	0.96	35102.6	11000.00
13	1276.08	215.33	0.231	0.60(0.58)	0.97	42111.7	10850.00
14	1188.07	231.68	0.225	0.60(0.58)	0.97	45620.0	11220.00
15	952.37	285.80	0.205	0.60(0.58)	0.97	54060.1	12410.00
16	899.22	319.27	0.193	0.60(0.58)	0.97	60138.3	12261.00
17	880.90	332.35	0.188	0.60(0.58)	0.97	61623.1	10410.00
18	863.14	344.73	0.184	0.60(0.58)	0.98	62728.9	12101.10
19	823.34	372.57	0.177	0.60(0.59)	0.98	65106.7	10200.00
20	803.97	386.18	0.176	0.60(0.59)	0.98	66046.3	12010.00
21	760.35	416.14	0.173	0.60(0.59)	0.98	66723.7	10210.00
22	698.77	466.26	0.168	0.60(0.59)	0.98	67225.5	12000.00
23	656.70	533.99	0.162	0.60(0.59)	0.98	67793.9	10100.00

TOTAL AREA(ACRES) = 67793.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1342.15 Tc(MIN.) = 83.133
EFFECTIVE AREA(ACRES) = 12152.78 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 67793.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

****
FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 135.00 DOWNSTREAM(FEET) = 133.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 207.23 CHANNEL SLOPE = 0.0097
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 1342.15
FLOW VELOCITY(FEET/SEC.) = 10.38 FLOW DEPTH(FEET) = 6.57
TRAVEL TIME(MIN.) = 0.33 Tc(MIN.) = 83.47
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13803.00 = 130616.03 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1114.10	37.28	0.525	0.60(0.58)	0.97	3642.3	10300.00
2	1163.62	40.58	0.500	0.60(0.58)	0.97	3959.4	10200.00
3	1264.59	46.16	0.468	0.60(0.58)	0.97	4583.8	21000.00
4	1243.54	57.62	0.413	0.60(0.58)	0.97	6590.7	10400.00
5	1231.88	63.30	0.396	0.60(0.58)	0.97	7525.5	20700.00
6	1342.15	83.47	0.352	0.60(0.58)	0.97	12152.8	30100.00
7	1165.67	100.29	0.323	0.60(0.58)	0.97	15732.2	20200.00
8	1088.45	112.70	0.305	0.60(0.58)	0.96	18291.1	13600.00
9	1004.31	130.94	0.285	0.60(0.57)	0.96	22032.5	13200.00

10	1041.94	153.13	0.266	0.60(0.57)	0.96	26285.2	11831.00
11	1129.50	175.36	0.248	0.60(0.58)	0.96	30755.1	11530.00
12	1190.54	194.19	0.239	0.60(0.58)	0.96	35102.6	11000.00
13	1276.08	215.67	0.231	0.60(0.58)	0.97	42111.7	10850.00
14	1188.07	232.03	0.225	0.60(0.58)	0.97	45620.0	11220.00
15	952.37	286.17	0.205	0.60(0.58)	0.97	54060.1	12410.00
16	899.22	319.64	0.193	0.60(0.58)	0.97	60138.3	12261.00
17	880.90	332.72	0.188	0.60(0.58)	0.97	61623.1	10410.00
18	863.14	345.10	0.183	0.60(0.58)	0.98	62728.9	12101.10
19	823.34	372.94	0.177	0.60(0.59)	0.98	65106.7	10200.00
20	803.97	386.55	0.176	0.60(0.59)	0.98	66046.3	12010.00
21	760.35	416.52	0.173	0.60(0.59)	0.98	66723.7	10210.00
22	698.77	466.65	0.168	0.60(0.59)	0.98	67225.5	12000.00
23	656.70	534.39	0.162	0.60(0.59)	0.98	67793.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1342.15 Tc(MIN.) = 83.47
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 12152.78

****
FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========
==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 67793.9 TC(MIN.) = 83.47
EFFECTIVE AREA(ACRES) = 12152.78 AREA-AVERAGED Fm(INCH/HR)= 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.971
PEAK FLOW RATE(CFS) = 1342.15

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1114.10	37.28	0.525	0.60(0.58)	0.97	3642.3	10300.00
2	1163.62	40.58	0.500	0.60(0.58)	0.97	3959.4	10200.00
3	1264.59	46.16	0.468	0.60(0.58)	0.97	4583.8	21000.00
4	1243.54	57.62	0.413	0.60(0.58)	0.97	6590.7	10400.00
5	1231.88	63.30	0.396	0.60(0.58)	0.97	7525.5	20700.00
6	1342.15	83.47	0.352	0.60(0.58)	0.97	12152.8	30100.00
7	1165.67	100.29	0.323	0.60(0.58)	0.97	15732.2	20200.00
8	1088.45	112.70	0.305	0.60(0.58)	0.96	18291.1	13600.00
9	1004.31	130.94	0.285	0.60(0.57)	0.96	22032.5	13200.00
10	1041.94	153.13	0.266	0.60(0.57)	0.96	26285.2	11831.00
11	1129.50	175.36	0.248	0.60(0.58)	0.96	30755.1	11530.00
12	1190.54	194.19	0.239	0.60(0.58)	0.96	35102.6	11000.00
13	1276.08	215.67	0.231	0.60(0.58)	0.97	42111.7	10850.00
14	1188.07	232.03	0.225	0.60(0.58)	0.97	45620.0	11220.00
15	952.37	286.17	0.205	0.60(0.58)	0.97	54060.1	12410.00
16	899.22	319.64	0.193	0.60(0.58)	0.97	60138.3	12261.00
17	880.90	332.72	0.188	0.60(0.58)	0.97	61623.1	10410.00
18	863.14	345.10	0.183	0.60(0.58)	0.98	62728.9	12101.10
19	823.34	372.94	0.177	0.60(0.59)	0.98	65106.7	10200.00
20	803.97	386.55	0.176	0.60(0.59)	0.98	66046.3	12010.00
21	760.35	416.52	0.173	0.60(0.59)	0.98	66723.7	10210.00
22	698.77	466.65	0.168	0.60(0.59)	0.98	67225.5	12000.00
23	656.70	534.39	0.162	0.60(0.59)	0.98	67793.9	10100.00

==========

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END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S38.DAT
  TIME/DATE OF STUDY: 08:06 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.798
   2)   10.00;  1.199
   3)   15.00;  0.922
   4)   20.00;  0.760
   5)   25.00;  0.658
   6)   30.00;  0.584
   7)   40.00;  0.503
   8)   50.00;  0.446
   9)   60.00;  0.402
  10)   90.00;  0.337
  11)  120.00;  0.293
  12)  180.00;  0.244
  13)  360.00;  0.177
  14) 1440.00;  0.077
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S37.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1     1264.59   46.16  0.60( 0.58) 0.97    4583.8   21000.00
      2     1243.54   57.62  0.60( 0.58) 0.97    6590.7   10400.00
      3     1342.15   83.47  0.60( 0.58) 0.97   12152.8   30100.00
      4     1165.67  100.29  0.60( 0.58) 0.97   15732.2   20200.00
      5     1088.45  112.70  0.60( 0.58) 0.96   18291.1   13600.00
      6     1004.31  130.94  0.60( 0.57) 0.96   22032.5   13200.00
      7     1041.94  153.13  0.60( 0.57) 0.96   26285.2   11831.00
      8     1129.50  175.36  0.60( 0.58) 0.96   30755.1   11530.00
      9     1190.54  194.19  0.60( 0.58) 0.96   35102.6   11000.00
     10     1276.08  215.67  0.60( 0.58) 0.97   42111.7   10850.00
     11     1188.07  232.03  0.60( 0.58) 0.97   45620.0   11220.00
     12      952.37  286.17  0.60( 0.58) 0.97   54060.1   12410.00
     13      899.22  319.64  0.60( 0.58) 0.97   60138.3   12261.00
     14      880.90  332.72  0.60( 0.58) 0.97   61623.1   10410.00
     15      863.14  345.10  0.60( 0.58) 0.98   62728.9   12101.10
     16      823.34  372.94  0.60( 0.59) 0.98   65106.7   10200.00
     17      803.97  386.55  0.60( 0.59) 0.98   66046.3   12010.00
     18      760.35  416.52  0.60( 0.59) 0.98   66723.7   10210.00
     19      698.77  466.65  0.60( 0.59) 0.98   67225.5   12000.00
     20      656.70  534.39  0.60( 0.59) 0.98   67793.9   10100.00
   TOTAL AREA(ACRES) =    67793.9

**************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1     1264.59   46.16  0.60( 0.58) 0.97    4583.8   21000.00
      2     1243.54   57.62  0.60( 0.58) 0.97    6590.7   10400.00
      3     1342.15   83.47  0.60( 0.58) 0.97   12152.8   30100.00
      4     1165.67  100.29  0.60( 0.58) 0.97   15732.2   20200.00
      5     1088.45  112.70  0.60( 0.58) 0.96   18291.1   13600.00
      6     1004.31  130.94  0.60( 0.57) 0.96   22032.5   13200.00
      7     1041.94  153.13  0.60( 0.57) 0.96   26285.2   11831.00
      8     1129.50  175.36  0.60( 0.58) 0.96   30755.1   11530.00
      9     1190.54  194.19  0.60( 0.58) 0.96   35102.6   11000.00
     10     1276.08  215.67  0.60( 0.58) 0.97   42111.7   10850.00
     11     1188.07  232.03  0.60( 0.58) 0.97   45620.0   11220.00
     12      952.37  286.17  0.60( 0.58) 0.97   54060.1   12410.00
     13      899.22  319.64  0.60( 0.58) 0.97   60138.3   12261.00
     14      880.90  332.72  0.60( 0.58) 0.97   61623.1   10410.00
     15      863.14  345.10  0.60( 0.58) 0.98   62728.9   12101.10
     16      823.34  372.94  0.60( 0.59) 0.98   65106.7   10200.00
     17      803.97  386.55  0.60( 0.59) 0.98   66046.3   12010.00
     18      760.35  416.52  0.60( 0.59) 0.98   66723.7   10210.00
```

```
     19      698.77  466.65  0.60( 0.59) 0.98   67225.5   12000.00
     20      656.70  534.39  0.60( 0.59) 0.98   67793.9   10100.00
    TOTAL AREA(ACRES) =     67793.9

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    140.00  DOWNSTREAM(FEET) =    137.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.91   CHANNEL SLOPE =  0.0032
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.346
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.70      0.60     0.983     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.983
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1342.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.89
  AVERAGE FLOW DEPTH(FEET) =   8.06   TRAVEL TIME(MIN.) =   2.24
  Tc(MIN.) =   85.71
  SUBAREA AREA(ACRES) =    53.70       SUBAREA RUNOFF(CFS) =    0.28
  EFFECTIVE AREA(ACRES) =  12206.48     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    67847.6         PEAK FLOW RATE(CFS) =    1342.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.06   FLOW VELOCITY(FEET/SEC.) =   6.89
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13820.00 =  131542.94 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1264.59   48.43    0.455  0.60( 0.58) 0.97    4637.5   21000.00
      2     1243.54   59.91    0.402  0.60( 0.58) 0.97    6644.4   10400.00
      3     1342.15   85.71    0.346  0.60( 0.58) 0.97   12206.5   30100.00
      4     1165.67  102.61    0.319  0.60( 0.58) 0.97   15785.9   20200.00
      5     1088.45  115.06    0.300  0.60( 0.58) 0.96   18344.8   13600.00
      6     1004.31  133.35    0.282  0.60( 0.57) 0.96   22086.2   13200.00
      7     1041.94  155.52    0.264  0.60( 0.57) 0.96   26338.9   11831.00
      8     1129.50  177.70    0.246  0.60( 0.58) 0.96   30808.8   11530.00
      9     1190.54  196.49    0.238  0.60( 0.58) 0.96   35156.3   11000.00
     10     1276.08  217.94    0.230  0.60( 0.58) 0.97   42165.4   10850.00
     11     1188.07  234.34    0.224  0.60( 0.58) 0.97   45673.7   11220.00
     12      952.37  288.61    0.204  0.60( 0.58) 0.97   54113.8   12410.00
     13      899.22  322.12    0.191  0.60( 0.58) 0.97   60192.0   12261.00
     14      880.90  335.21    0.186  0.60( 0.58) 0.97   61676.8   10410.00
     15      863.14  347.60    0.182  0.60( 0.58) 0.98   62782.6   12101.10
     16      823.34  375.48    0.176  0.60( 0.59) 0.98   65160.4   10200.00
```



```
     17      803.97  389.10    0.174  0.60( 0.59) 0.98   66100.0   12010.00
     18      760.35  419.11    0.172  0.60( 0.59) 0.98   66777.4   10210.00
     19      698.77  469.29    0.167  0.60( 0.59) 0.98   67279.2   12000.00
     20      656.70  537.07    0.161  0.60( 0.59) 0.98   67847.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1342.15  Tc(MIN.) =   85.71
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   12206.48

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   85.71
  RAINFALL INTENSITY(INCH/HR) =   0.35
  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   12206.48
  TOTAL STREAM AREA(ACRES) =   67847.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1342.15

****************************************************************************
  FLOW PROCESS FROM NODE  13810.00 TO NODE  13811.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   648.54
  ELEVATION DATA: UPSTREAM(FEET) =    756.46  DOWNSTREAM(FEET) =    586.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.293
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.072
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.58      0.60     1.000     0   12.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.37
  TOTAL AREA(ACRES) =      5.58   PEAK FLOW RATE(CFS) =      2.37

****************************************************************************
  FLOW PROCESS FROM NODE  13811.00 TO NODE  13811.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    586.02  DOWNSTREAM(FEET) =    437.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =   696.28   CHANNEL SLOPE =  0.2130
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.938
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.79      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.79
  AVERAGE FLOW DEPTH(FEET) =   0.57   TRAVEL TIME(MIN.) =   2.42
  Tc(MIN.) =   14.72
  SUBAREA AREA(ACRES) =    14.79       SUBAREA RUNOFF(CFS) =    4.50
  EFFECTIVE AREA(ACRES) =     20.37     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =       6.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   5.10
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13811.50 =    1344.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13811.50 TO NODE  13812.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    437.69  DOWNSTREAM(FEET) =    402.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   681.04   CHANNEL SLOPE =  0.0519
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.817
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.41      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.22
  AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =   3.52
  Tc(MIN.) =   18.24
  SUBAREA AREA(ACRES) =    18.41       SUBAREA RUNOFF(CFS) =    3.60
  EFFECTIVE AREA(ACRES) =     38.78     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.8         PEAK FLOW RATE(CFS) =       7.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.89   FLOW VELOCITY(FEET/SEC.) =   3.19
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13812.00 =    2025.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13812.00 TO NODE  13813.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    402.36  DOWNSTREAM(FEET) =    259.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1282.56   CHANNEL SLOPE =  0.1112
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```



```
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.699
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.87      0.60     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.49
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   4.76
  Tc(MIN.) =   23.00
  SUBAREA AREA(ACRES) =    27.87       SUBAREA RUNOFF(CFS) =    4.62
  EFFECTIVE AREA(ACRES) =     66.65     AREA-AVERAGED Fm(INCH/HR) =   0.56
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =       8.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.79   FLOW VELOCITY(FEET/SEC.) =   4.31
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13813.00 =    3308.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   259.72  DOWNSTREAM(FEET) =   137.00
  FLOW LENGTH(FEET) =  2412.88   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   5.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.92
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.07
  PIPE TRAVEL TIME(MIN.) =   3.68    Tc(MIN.) =   26.68
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13820.00 =    5721.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.68
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.633
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.54      0.60     0.570     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.570
  SUBAREA AREA(ACRES) =   82.54      SUBAREA RUNOFF(CFS) =   21.63
  EFFECTIVE AREA(ACRES) =    149.19   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =      149.2       PEAK FLOW RATE(CFS) =      25.76

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
```

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 26.68
RAINFALL INTENSITY(INCH/HR) = 0.63
AREA-AVERAGED Fm(INCH/HR) = 0.44
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.74
EFFECTIVE STREAM AREA(ACRES) = 149.19
TOTAL STREAM AREA(ACRES) = 149.19
PEAK FLOW RATE(CFS) AT CONFLUENCE = 25.76

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1264.59	48.43	0.455	0.60(0.58)	0.97	4637.5	21000.00
1	1243.54	59.91	0.402	0.60(0.58)	0.97	6644.4	10400.00
1	1342.15	85.71	0.346	0.60(0.58)	0.97	12206.5	30100.00
1	1165.67	102.61	0.319	0.60(0.58)	0.97	15785.9	20200.00
1	1088.45	115.06	0.300	0.60(0.58)	0.96	18344.8	13600.00
1	1004.31	133.35	0.282	0.60(0.57)	0.96	22086.2	13200.00
1	1041.94	155.52	0.264	0.60(0.57)	0.96	26338.9	11831.00
1	1129.50	177.70	0.246	0.60(0.58)	0.96	30808.8	11530.00
1	1190.54	196.49	0.238	0.60(0.58)	0.96	35156.3	11000.00
1	1276.08	217.94	0.230	0.60(0.58)	0.97	42165.4	10850.00
1	1188.07	234.34	0.224	0.60(0.58)	0.97	45673.7	11220.00
1	952.37	288.61	0.204	0.60(0.58)	0.97	54113.8	12410.00
1	899.22	322.12	0.191	0.60(0.58)	0.97	60192.0	12261.00
1	880.90	335.21	0.186	0.60(0.58)	0.97	61676.8	10410.00
1	863.14	347.60	0.182	0.60(0.58)	0.98	62782.6	12101.10
1	823.34	375.48	0.176	0.60(0.59)	0.98	65160.4	10200.00
1	803.97	389.10	0.174	0.60(0.59)	0.98	66100.0	12010.00
1	760.35	419.11	0.172	0.60(0.59)	0.98	66777.4	10210.00
1	698.77	469.29	0.167	0.60(0.59)	0.98	67279.2	12000.00
1	656.70	537.07	0.161	0.60(0.59)	0.98	67847.6	10100.00
2	25.76	26.68	0.633	0.60(0.44)	0.74	149.2	13810.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1290.36	26.68	0.633	0.60(0.57)	0.96	2704.1	13810.00
2	1280.75	48.43	0.455	0.60(0.58)	0.96	4786.7	21000.00
3	1257.83	59.91	0.402	0.60(0.58)	0.97	6793.6	10400.00
4	1354.45	85.71	0.346	0.60(0.58)	0.97	12355.7	30100.00
5	1176.97	102.61	0.319	0.60(0.58)	0.96	15935.1	20200.00
6	1099.11	115.06	0.300	0.60(0.58)	0.96	18493.9	13600.00
7	1014.33	133.35	0.282	0.60(0.57)	0.96	22235.4	13200.00
8	1051.31	155.52	0.264	0.60(0.57)	0.96	26488.1	11831.00
9	1138.23	177.70	0.246	0.60(0.57)	0.96	30958.0	11530.00
10	1198.98	196.49	0.238	0.60(0.58)	0.96	35305.5	11000.00
11	1284.24	217.94	0.230	0.60(0.58)	0.97	42314.6	10850.00
12	1196.02	234.34	0.224	0.60(0.58)	0.97	45822.9	11220.00
13	959.60	288.61	0.204	0.60(0.58)	0.97	54262.9	12410.00

14	906.01	322.12	0.191	0.60(0.58)	0.97	60341.2	12261.00
15	887.51	335.21	0.186	0.60(0.58)	0.97	61826.0	10410.00
16	869.58	347.60	0.182	0.60(0.58)	0.97	62931.8	12101.10
17	829.57	375.48	0.176	0.60(0.58)	0.98	65309.6	10200.00
18	810.16	389.10	0.174	0.60(0.59)	0.98	66249.2	12010.00
19	766.44	419.11	0.172	0.60(0.59)	0.98	66926.6	10210.00
20	704.69	469.29	0.167	0.60(0.59)	0.98	67428.4	12000.00
21	662.40	537.07	0.161	0.60(0.59)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1354.45 Tc(MIN.) = 85.71
EFFECTIVE AREA(ACRES) = 12355.67 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 67996.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

****

FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========

ELEVATION DATA: UPSTREAM(FEET) = 137.00 DOWNSTREAM(FEET) = 133.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1261.34 CHANNEL SLOPE = 0.0032
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.340
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.60	0.60	0.683	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1355.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.85
AVERAGE FLOW DEPTH(FEET) = 8.12 TRAVEL TIME(MIN.) = 3.07
Tc(MIN.) = 88.78
SUBAREA AREA(ACRES) = 31.60 SUBAREA RUNOFF(CFS) = 3.06
EFFECTIVE AREA(ACRES) = 12387.27 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 68028.3 PEAK FLOW RATE(CFS) = 1354.45
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.11 FLOW VELOCITY(FEET/SEC.) = 6.86
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1290.36	29.79	0.587	0.60(0.57)	0.95	2735.7	13810.00
2	1280.75	51.54	0.439	0.60(0.58)	0.96	4818.3	21000.00
3	1257.83	63.03	0.395	0.60(0.58)	0.96	6825.2	10400.00
4	1354.45	88.78	0.340	0.60(0.58)	0.97	12387.3	30100.00

```
      5     1176.97  105.78    0.314  0.60( 0.58) 0.96   15966.7   20200.00
      6     1099.11  118.30    0.295  0.60( 0.58) 0.96   18525.5   13600.00
      7     1014.33  136.65    0.279  0.60( 0.57) 0.96   22267.0   13200.00
      8     1051.31  158.79    0.261  0.60( 0.57) 0.96   26519.7   11831.00
      9     1138.23  180.91    0.244  0.60( 0.57) 0.96   30989.6   11530.00
     10     1198.98  199.66    0.237  0.60( 0.58) 0.96   35337.1   11000.00
     11     1284.24  221.05    0.229  0.60( 0.58) 0.97   42346.2   10850.00
     12     1196.02  237.50    0.223  0.60( 0.58) 0.97   45854.5   11220.00
     13      959.60  291.95    0.202  0.60( 0.58) 0.97   54294.6   12410.00
     14      906.01  325.51    0.190  0.60( 0.58) 0.97   60372.8   12261.00
     15      887.51  338.62    0.185  0.60( 0.58) 0.97   61857.6   10410.00
     16      869.58  351.03    0.180  0.60( 0.58) 0.97   62963.4   12101.10
     17      829.57  378.95    0.175  0.60( 0.58) 0.98   65341.2   10200.00
     18      810.16  392.59    0.174  0.60( 0.59) 0.98   66280.8   12010.00
     19      766.44  422.64    0.171  0.60( 0.59) 0.98   66958.2   10210.00
     20      704.69  472.91    0.167  0.60( 0.59) 0.98   67460.0   12000.00
     21      662.40  540.73    0.160  0.60( 0.59) 0.98   68028.3   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1354.45  Tc(MIN.) =   88.78
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   12387.27

****************************************************************************
  FLOW PROCESS FROM NODE  13820.00 TO NODE  13840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   88.78
  RAINFALL INTENSITY(INCH/HR) =   0.34
  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   12387.27
  TOTAL STREAM AREA(ACRES) =   68028.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1354.45

****************************************************************************
  FLOW PROCESS FROM NODE  13830.00 TO NODE  13831.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   744.71
  ELEVATION DATA: UPSTREAM(FEET) =   1100.95  DOWNSTREAM(FEET) =    959.21

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.858
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.985
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.06      0.60     1.000     0   13.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.76
```



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  TOTAL AREA(ACRES) =      5.06   PEAK FLOW RATE(CFS) =      1.76

****************************************************************************
  FLOW PROCESS FROM NODE  13831.00 TO NODE  13832.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    959.21  DOWNSTREAM(FEET) =    832.83
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1076.71   CHANNEL SLOPE =  0.1174
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.809
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.57      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.86
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   4.64
  Tc(MIN.) =   18.50
  SUBAREA AREA(ACRES) =    32.57       SUBAREA RUNOFF(CFS) =    6.12
  EFFECTIVE AREA(ACRES) =     37.63     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =       7.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   4.25
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13832.00 =    1821.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13832.00 TO NODE  13833.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    832.83  DOWNSTREAM(FEET) =    572.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.58   CHANNEL SLOPE =  0.1382
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.655
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.23      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.68
  AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   6.71
  Tc(MIN.) =   25.21
  SUBAREA AREA(ACRES) =    32.23       SUBAREA RUNOFF(CFS) =    1.59
  EFFECTIVE AREA(ACRES) =     69.86     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.9         PEAK FLOW RATE(CFS) =       7.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.72   FLOW VELOCITY(FEET/SEC.) =   4.52
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13833.00 =    3705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13833.00 TO NODE  13834.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    572.49  DOWNSTREAM(FEET) =    471.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.78   CHANNEL SLOPE =  0.1068
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.598
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.51      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.10
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   3.83
  Tc(MIN.) =   29.05
  SUBAREA AREA(ACRES) =    27.51       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =     97.37     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =       7.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   4.10
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13834.00 =    4648.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13834.00 TO NODE  13835.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    471.65  DOWNSTREAM(FEET) =    347.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1647.45   CHANNEL SLOPE =  0.0756
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.530
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.21      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
```



```
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.58
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   7.68
  Tc(MIN.) =   36.72
  SUBAREA AREA(ACRES) =    94.21       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    191.58     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      191.6         PEAK FLOW RATE(CFS) =       7.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   3.58
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13835.00 =    6296.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13835.00 TO NODE  13836.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    347.06  DOWNSTREAM(FEET) =    269.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1696.71   CHANNEL SLOPE =  0.0458
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.467
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      233.25      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.98
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   9.50
  Tc(MIN.) =   46.23
  SUBAREA AREA(ACRES) =   233.25       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =    424.83     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      424.8         PEAK FLOW RATE(CFS) =       7.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.89   FLOW VELOCITY(FEET/SEC.) =   2.98
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13836.00 =    7992.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13836.00 TO NODE  13837.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    269.29  DOWNSTREAM(FEET) =    191.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2529.21   CHANNEL SLOPE =  0.0306
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.399
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.70      0.60     0.880     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.80
  AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =  15.04
  Tc(MIN.) =   61.26
  SUBAREA AREA(ACRES) =   134.70       SUBAREA RUNOFF(CFS) =    5.81
  EFFECTIVE AREA(ACRES) =    559.53     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      559.5         PEAK FLOW RATE(CFS) =       7.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   2.56
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13837.00 =   10522.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   191.87  DOWNSTREAM(FEET) =   133.00
  FLOW LENGTH(FEET) =  1151.02   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   5.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.51
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.07
  PIPE TRAVEL TIME(MIN.) =   1.82    Tc(MIN.) =   63.09
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13840.00 =   11673.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   63.09
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.395
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       5.97      0.60     0.622     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.622
```



```
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  SUBAREA AREA(ACRES) =    5.97      SUBAREA RUNOFF(CFS) =    0.80
  EFFECTIVE AREA(ACRES) =    565.50   AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.97
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      565.5       PEAK FLOW RATE(CFS) =       7.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   63.09
  RAINFALL INTENSITY(INCH/HR) =   0.40
  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     565.50
  TOTAL STREAM AREA(ACRES) =     565.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.07

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1290.36   29.79    0.587  0.60( 0.57) 0.95    2735.7   13810.00
      1     1280.75   51.54    0.439  0.60( 0.58) 0.96    4818.3   21000.00
      1     1257.83   63.03    0.395  0.60( 0.58) 0.96    6825.2   10400.00
      1     1354.45   88.78    0.340  0.60( 0.58) 0.97   12387.3   30100.00
      1     1176.97  105.78    0.314  0.60( 0.58) 0.96   15966.7   20200.00
      1     1099.11  118.30    0.295  0.60( 0.58) 0.96   18525.5   13600.00
      1     1014.33  136.65    0.279  0.60( 0.57) 0.96   22267.0   13200.00
      1     1051.31  158.79    0.261  0.60( 0.57) 0.96   26519.7   11831.00
      1     1138.23  180.91    0.244  0.60( 0.57) 0.96   30989.6   11530.00
      1     1198.98  199.66    0.237  0.60( 0.58) 0.96   35337.1   11000.00
      1     1284.24  221.05    0.229  0.60( 0.58) 0.97   42346.2   10850.00
      1     1196.02  237.50    0.223  0.60( 0.58) 0.97   45854.5   11220.00
      1      959.60  291.95    0.202  0.60( 0.58) 0.97   54294.6   12410.00
      1      906.01  325.51    0.190  0.60( 0.58) 0.97   60372.8   12261.00
      1      887.51  338.62    0.185  0.60( 0.58) 0.97   61857.6   10410.00
      1      869.58  351.03    0.180  0.60( 0.58) 0.97   62963.4   12101.10
      1      829.57  378.95    0.175  0.60( 0.58) 0.98   65341.2   10200.00
      1      810.16  392.59    0.174  0.60( 0.59) 0.98   66280.8   12010.00
      1      766.44  422.64    0.171  0.60( 0.59) 0.98   66958.2   10210.00
      1      704.69  472.91    0.167  0.60( 0.59) 0.98   67460.0   12000.00
      1      662.40  540.73    0.160  0.60( 0.59) 0.98   68028.3   10100.00
      2        7.07   63.09    0.395  0.60( 0.58) 0.97     565.5   13830.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	1295.31	29.79	0.587	0.60(0.57)	0.96	3002.7	13810.00
2	1287.16	51.54	0.439	0.60(0.58)	0.96	5280.3	21000.00
3	1264.89	63.03	0.395	0.60(0.58)	0.97	7390.2	10400.00
4	1265.12	63.09	0.395	0.60(0.58)	0.97	7403.5	13830.00
5	1360.52	88.78	0.340	0.60(0.58)	0.97	12952.8	30100.00
6	1182.58	105.78	0.314	0.60(0.58)	0.96	16532.2	20200.00
7	1104.39	118.30	0.295	0.60(0.58)	0.96	19091.0	13600.00
8	1019.32	136.65	0.279	0.60(0.57)	0.96	22832.5	13200.00
9	1055.98	158.79	0.261	0.60(0.57)	0.96	27085.2	11831.00
10	1142.59	180.91	0.244	0.60(0.57)	0.96	31555.1	11530.00
11	1203.22	199.66	0.237	0.60(0.58)	0.96	35902.6	11000.00
12	1288.33	221.05	0.229	0.60(0.58)	0.97	42911.7	10850.00
13	1200.00	237.50	0.223	0.60(0.58)	0.97	46420.0	11220.00
14	963.22	291.95	0.202	0.60(0.58)	0.97	54860.1	12410.00
15	909.40	325.51	0.190	0.60(0.58)	0.97	60938.3	12261.00
16	890.82	338.62	0.185	0.60(0.58)	0.97	62423.1	10410.00
17	872.81	351.03	0.180	0.60(0.58)	0.97	63528.9	12101.10
18	832.70	378.95	0.175	0.60(0.58)	0.98	65906.7	10200.00
19	813.27	392.59	0.174	0.60(0.59)	0.98	66846.3	12010.00
20	769.50	422.64	0.171	0.60(0.59)	0.98	67523.7	10210.00
21	707.67	472.91	0.167	0.60(0.59)	0.98	68025.5	12000.00
22	665.27	540.73	0.160	0.60(0.59)	0.98	68593.8	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1360.52 Tc(MIN.) = 88.78
EFFECTIVE AREA(ACRES) = 12952.77 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 68593.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

****
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 133.00 DOWNSTREAM(FEET) = 130.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.44 CHANNEL SLOPE = 0.0046
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.337
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.61	0.60	0.975	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.975
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1360.54
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.88
AVERAGE FLOW DEPTH(FEET) = 7.59 TRAVEL TIME(MIN.) = 1.38
Tc(MIN.) = 90.16
SUBAREA AREA(ACRES) = 6.61 SUBAREA RUNOFF(CFS) = 0.05
EFFECTIVE AREA(ACRES) = 12959.38 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 68600.5 PEAK FLOW RATE(CFS) = 1360.52
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.59 FLOW VELOCITY(FEET/SEC.) = 7.88
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)		Ap	Ae (ACRES)	HEADWATER NODE
1	1295.31	31.19	0.574	0.60(0.57)		0.96	3009.3	13810.00
2	1287.16	52.95	0.433	0.60(0.58)		0.96	5286.9	21000.00
3	1264.89	64.44	0.392	0.60(0.58)		0.97	7396.8	10400.00
4	1265.12	64.50	0.392	0.60(0.58)		0.97	7410.2	13830.00
5	1360.52	90.16	0.337	0.60(0.58)		0.97	12959.4	30100.00
6	1182.58	107.22	0.312	0.60(0.58)		0.96	16538.8	20200.00
7	1104.39	119.76	0.293	0.60(0.58)		0.96	19097.7	13600.00
8	1019.32	138.14	0.278	0.60(0.57)		0.96	22839.1	13200.00
9	1055.98	160.26	0.260	0.60(0.57)		0.96	27091.8	11831.00
10	1142.59	182.36	0.243	0.60(0.57)		0.96	31561.7	11530.00
11	1203.22	201.08	0.236	0.60(0.58)		0.96	35909.2	11000.00
12	1288.33	222.45	0.228	0.60(0.58)		0.97	42918.3	10850.00
13	1200.00	238.93	0.222	0.60(0.58)		0.97	46426.6	11220.00
14	963.22	293.46	0.202	0.60(0.58)		0.97	54866.7	12410.00
15	909.40	327.04	0.189	0.60(0.58)		0.97	60944.9	12261.00
16	890.82	340.16	0.184	0.60(0.58)		0.97	62429.7	10410.00
17	872.81	352.58	0.180	0.60(0.58)		0.97	63535.5	12101.10
18	832.70	380.51	0.175	0.60(0.58)		0.98	65913.3	10200.00
19	813.27	394.17	0.174	0.60(0.59)		0.98	66852.9	12010.00
20	769.50	424.24	0.171	0.60(0.59)		0.98	67530.3	10210.00
21	707.67	474.54	0.166	0.60(0.59)		0.98	68032.1	12000.00
22	665.27	542.39	0.160	0.60(0.59)		0.98	68600.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1360.52 Tc(MIN.) = 90.16
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 12959.38

****
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 90.16
RAINFALL INTENSITY(INCH/HR) = 0.34
AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.97
EFFECTIVE STREAM AREA(ACRES) = 12959.38
TOTAL STREAM AREA(ACRES) = 68600.45
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1360.52

****
FLOW PROCESS FROM NODE 13850.00 TO NODE 13851.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   617.57
  ELEVATION DATA: UPSTREAM(FEET) =    646.95  DOWNSTREAM(FEET) =    490.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.137
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.081
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        4.95      0.60     1.000     0   12.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.14
  TOTAL AREA(ACRES) =      4.95   PEAK FLOW RATE(CFS) =      2.14

********************************************************************************
  FLOW PROCESS FROM NODE  13851.00 TO NODE  13851.50 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.10  DOWNSTREAM(FEET) =    440.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   351.14   CHANNEL SLOPE =  0.1399
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.990
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.02      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.60
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   1.63
  Tc(MIN.) =   13.76
  SUBAREA AREA(ACRES) =     4.02       SUBAREA RUNOFF(CFS) =    1.41
  EFFECTIVE AREA(ACRES) =      8.97     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.0         PEAK FLOW RATE(CFS) =       3.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =   3.73
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13851.50 =     968.71 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13851.50 TO NODE  13852.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    440.98  DOWNSTREAM(FEET) =    395.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.91   CHANNEL SLOPE =  0.0882
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```



```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.879
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.17      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.32
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   2.57
  Tc(MIN.) =   16.34
  SUBAREA AREA(ACRES) =     7.17       SUBAREA RUNOFF(CFS) =    1.80
  EFFECTIVE AREA(ACRES) =     16.14     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       16.1         PEAK FLOW RATE(CFS) =       4.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   3.32
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13852.00 =    1481.62 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13852.00 TO NODE  13853.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    395.76  DOWNSTREAM(FEET) =    354.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   443.69   CHANNEL SLOPE =  0.0920
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.810
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.76      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.50
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   2.11
  Tc(MIN.) =   18.45
  SUBAREA AREA(ACRES) =     6.76       SUBAREA RUNOFF(CFS) =    1.28
  EFFECTIVE AREA(ACRES) =     22.90     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.9         PEAK FLOW RATE(CFS) =       4.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   3.41
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13853.00 =    1925.31 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13853.00 TO NODE  13854.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    354.94  DOWNSTREAM(FEET) =    263.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.09   CHANNEL SLOPE =  0.0950
```

```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.701
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.16      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.62
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   4.42
  Tc(MIN.) =   22.88
  SUBAREA AREA(ACRES) =    18.16       SUBAREA RUNOFF(CFS) =    1.66
  EFFECTIVE AREA(ACRES) =     41.06     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.1         PEAK FLOW RATE(CFS) =       4.34
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   3.47
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13854.00 =    2887.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13854.00 TO NODE  13855.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    263.57  DOWNSTREAM(FEET) =    188.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1228.77   CHANNEL SLOPE =  0.0609
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.592
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.75      0.60     0.879     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.879
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.12
  AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =   6.57
  Tc(MIN.) =   29.45
  SUBAREA AREA(ACRES) =    38.75       SUBAREA RUNOFF(CFS) =    2.50
  EFFECTIVE AREA(ACRES) =     79.81     AREA-AVERAGED Fm(INCH/HR) =   0.56
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.94
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =       79.8         PEAK FLOW RATE(CFS) =       4.34
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   2.96
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13855.00 =    4116.17 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   188.74  DOWNSTREAM(FEET) =   130.00
  FLOW LENGTH(FEET) =  2092.67   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.36
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.34
  PIPE TRAVEL TIME(MIN.) =   4.74    Tc(MIN.) =   34.19
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13860.00 =    6208.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   34.19
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.550
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.41      0.60     0.707     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.707
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  SUBAREA AREA(ACRES) =   43.41       SUBAREA RUNOFF(CFS) =    6.30
  EFFECTIVE AREA(ACRES) =    123.22   AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.86
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      123.2       PEAK FLOW RATE(CFS) =       8.62

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.19
  RAINFALL INTENSITY(INCH/HR) =   0.55
  AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.86
  EFFECTIVE STREAM AREA(ACRES) =     123.22
  TOTAL STREAM AREA(ACRES) =     123.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       8.62

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
```

1	1295.31	31.19	0.574	0.60(0.57)	0.96	3009.3	13810.00
1	1287.16	52.95	0.433	0.60(0.58)	0.96	5286.9	21000.00
1	1264.89	64.44	0.392	0.60(0.58)	0.97	7396.8	10400.00
1	1265.12	64.50	0.392	0.60(0.58)	0.97	7410.2	13830.00
1	1360.52	90.16	0.337	0.60(0.58)	0.97	12959.4	30100.00
1	1182.58	107.22	0.312	0.60(0.58)	0.96	16538.8	20200.00
1	1104.39	119.76	0.293	0.60(0.58)	0.96	19097.7	13600.00
1	1019.32	138.14	0.278	0.60(0.57)	0.96	22839.1	13200.00
1	1055.98	160.26	0.260	0.60(0.57)	0.96	27091.8	11831.00
1	1142.59	182.36	0.243	0.60(0.57)	0.96	31561.7	11530.00
1	1203.22	201.08	0.236	0.60(0.58)	0.96	35909.2	11000.00
1	1288.33	222.45	0.228	0.60(0.58)	0.97	42918.3	10850.00
1	1200.00	238.93	0.222	0.60(0.58)	0.97	46426.6	11220.00
1	963.22	293.46	0.202	0.60(0.58)	0.97	54866.7	12410.00
1	909.40	327.04	0.189	0.60(0.58)	0.97	60944.9	12261.00
1	890.82	340.16	0.184	0.60(0.58)	0.97	62429.7	10410.00
1	872.81	352.58	0.180	0.60(0.58)	0.97	63535.5	12101.10
1	832.70	380.51	0.175	0.60(0.58)	0.98	65913.3	10200.00
1	813.27	394.17	0.174	0.60(0.59)	0.98	66852.9	12010.00
1	769.50	424.24	0.171	0.60(0.59)	0.98	67530.3	10210.00
1	707.67	474.54	0.166	0.60(0.59)	0.98	68032.1	12000.00
1	665.27	542.39	0.160	0.60(0.59)	0.98	68600.5	10100.00
2	8.62	34.19	0.550	0.60(0.52)	0.86	123.2	13850.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1303.52	31.19	0.574	0.60(0.57)	0.95	3121.7	13810.00
2	1302.81	34.19	0.550	0.60(0.57)	0.95	3446.5	13850.00
3	1293.95	52.95	0.433	0.60(0.58)	0.96	5410.2	21000.00
4	1271.04	64.44	0.392	0.60(0.58)	0.96	7520.0	10400.00
5	1271.27	64.50	0.392	0.60(0.58)	0.96	7533.4	13830.00
6	1365.79	90.16	0.337	0.60(0.58)	0.97	13082.6	30100.00
7	1187.47	107.22	0.312	0.60(0.58)	0.96	16662.0	20200.00
8	1108.99	119.76	0.293	0.60(0.58)	0.96	19220.9	13600.00
9	1023.68	138.14	0.278	0.60(0.57)	0.96	22962.4	13200.00
10	1060.06	160.26	0.260	0.60(0.57)	0.96	27215.0	11831.00
11	1146.40	182.36	0.243	0.60(0.57)	0.96	31684.9	11530.00
12	1206.91	201.08	0.236	0.60(0.58)	0.96	36032.4	11000.00
13	1291.91	222.45	0.228	0.60(0.58)	0.97	43041.6	10850.00
14	1203.48	238.93	0.222	0.60(0.58)	0.97	46549.8	11220.00
15	966.38	293.46	0.202	0.60(0.58)	0.97	54989.9	12410.00
16	912.37	327.04	0.189	0.60(0.58)	0.97	61068.2	12261.00
17	893.71	340.16	0.184	0.60(0.58)	0.97	62552.9	10410.00
18	875.63	352.58	0.180	0.60(0.58)	0.97	63658.7	12101.10
19	835.45	380.51	0.175	0.60(0.58)	0.97	66036.5	10200.00
20	815.99	394.17	0.174	0.60(0.58)	0.98	66976.1	12010.00
21	772.18	424.24	0.171	0.60(0.59)	0.98	67653.6	10210.00
22	710.28	474.54	0.166	0.60(0.59)	0.98	68155.3	12000.00
23	667.78	542.39	0.160	0.60(0.59)	0.98	68723.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1365.79 Tc(MIN.) = 90.16
EFFECTIVE AREA(ACRES) = 13082.60 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 68723.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

****
FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 130.00 DOWNSTREAM(FEET) = 120.57
CHANNEL LENGTH THRU SUBAREA(FEET) = 610.77 CHANNEL SLOPE = 0.0154
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.336
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.89	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1365.79
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.43
AVERAGE FLOW DEPTH(FEET) = 6.05 TRAVEL TIME(MIN.) = 0.82
Tc(MIN.) = 90.98
SUBAREA AREA(ACRES) = 4.89 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 13087.49 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 68728.6 PEAK FLOW RATE(CFS) = 1365.79
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.05 FLOW VELOCITY(FEET/SEC.) = 12.43
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1303.52	32.02	0.568	0.60(0.57)	0.95	3126.6	13810.00
2	1302.81	35.02	0.543	0.60(0.57)	0.95	3451.4	13850.00
3	1293.95	53.78	0.429	0.60(0.58)	0.96	5415.0	21000.00
4	1271.04	65.27	0.391	0.60(0.58)	0.96	7524.9	10400.00
5	1271.27	65.33	0.390	0.60(0.58)	0.96	7538.3	13830.00
6	1365.79	90.98	0.336	0.60(0.58)	0.97	13087.5	30100.00
7	1187.47	108.07	0.311	0.60(0.58)	0.96	16666.9	20200.00
8	1108.99	120.62	0.292	0.60(0.58)	0.96	19225.8	13600.00
9	1023.68	139.02	0.277	0.60(0.57)	0.96	22967.3	13200.00
10	1060.06	161.13	0.259	0.60(0.57)	0.96	27219.9	11831.00
11	1146.40	183.21	0.243	0.60(0.57)	0.96	31689.8	11530.00
12	1206.91	201.93	0.236	0.60(0.58)	0.96	36037.3	11000.00
13	1291.91	223.28	0.228	0.60(0.58)	0.97	43046.5	10850.00
14	1203.48	239.77	0.222	0.60(0.58)	0.97	46554.7	11220.00
15	966.38	294.35	0.201	0.60(0.58)	0.97	54994.8	12410.00
16	912.37	327.95	0.189	0.60(0.58)	0.97	61073.1	12261.00
17	893.71	341.07	0.184	0.60(0.58)	0.97	62557.8	10410.00

```
    18      875.63  353.49    0.179  0.60( 0.58) 0.97   63663.6   12101.10
    19      835.45  381.44    0.175  0.60( 0.58) 0.97   66041.4   10200.00
    20      815.99  395.10    0.174  0.60( 0.58) 0.98   66981.0   12010.00
    21      772.18  425.19    0.171  0.60( 0.59) 0.98   67658.4   10210.00
    22      710.28  475.50    0.166  0.60( 0.59) 0.98   68160.2   12000.00
    23      667.78  543.37    0.160  0.60( 0.59) 0.98   68728.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1365.79  Tc(MIN.) =   90.98
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   13087.49

****************************************************************************
  FLOW PROCESS FROM NODE  13860.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   90.98
  RAINFALL INTENSITY(INCH/HR) =   0.34
  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   13087.49
  TOTAL STREAM AREA(ACRES) =   68728.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1365.79

****************************************************************************
  FLOW PROCESS FROM NODE  13870.00 TO NODE  13871.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   872.65
  ELEVATION DATA: UPSTREAM(FEET) =    558.52  DOWNSTREAM(FEET) =    436.47

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.704
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.899
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        9.32      0.60     1.000     0   15.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.51
  TOTAL AREA(ACRES) =      9.32   PEAK FLOW RATE(CFS) =      2.51

****************************************************************************
  FLOW PROCESS FROM NODE  13871.00 TO NODE  13872.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.47  DOWNSTREAM(FEET) =    337.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =   827.95   CHANNEL SLOPE =  0.1194
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```



```
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.775
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.27      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.61
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   19.52
  SUBAREA AREA(ACRES) =    14.27       SUBAREA RUNOFF(CFS) =    2.25
  EFFECTIVE AREA(ACRES) =     23.59     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =       3.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   3.64
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13872.00 =    1700.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13872.00 TO NODE  13873.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    337.62  DOWNSTREAM(FEET) =    253.88
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1049.16   CHANNEL SLOPE =  0.0798
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.666
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.74      0.60     0.923     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.923
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.45
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   5.06
  Tc(MIN.) =   24.59
  SUBAREA AREA(ACRES) =    35.74       SUBAREA RUNOFF(CFS) =    3.63
  EFFECTIVE AREA(ACRES) =     59.33     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =       59.3         PEAK FLOW RATE(CFS) =       5.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   3.38
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13873.00 =    2749.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13873.00 TO NODE  13874.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    253.88  DOWNSTREAM(FEET) =    160.73
```

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  CHANNEL LENGTH THRU SUBAREA(FEET) =  1518.60   CHANNEL SLOPE =  0.0613
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.580
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.43      0.60     0.900     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.32
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   5.86
  Tc(MIN.) =   30.45
  SUBAREA AREA(ACRES) =    32.43       SUBAREA RUNOFF(CFS) =    1.69
  EFFECTIVE AREA(ACRES) =     91.76     AREA-AVERAGED Fm(INCH/HR) =   0.56
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.93
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =       91.8         PEAK FLOW RATE(CFS) =       5.04
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13874.00 =    4268.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13874.00 TO NODE  13875.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    160.73  DOWNSTREAM(FEET) =    158.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   582.74   CHANNEL SLOPE =  0.0044
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.532
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.67      0.60     0.930     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.930
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.63
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   5.95
  Tc(MIN.) =   36.40
  SUBAREA AREA(ACRES) =    73.67       SUBAREA RUNOFF(CFS) =    2.47
  EFFECTIVE AREA(ACRES) =    165.43     AREA-AVERAGED Fm(INCH/HR) =   0.56
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.93
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      165.4         PEAK FLOW RATE(CFS) =       5.34
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =   1.57
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13875.00 =    4851.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.14  DOWNSTREAM(FEET) =   120.57
  FLOW LENGTH(FEET) =  1855.67   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   5.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.98
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.34
  PIPE TRAVEL TIME(MIN.) =   4.43    Tc(MIN.) =   40.83
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13880.00 =    6706.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.83
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.498
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.90      0.60     0.743     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.743
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  SUBAREA AREA(ACRES) =    34.90       SUBAREA RUNOFF(CFS) =    4.02
  EFFECTIVE AREA(ACRES) =    200.33   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.90
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =      200.3       PEAK FLOW RATE(CFS) =       9.02

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   40.83
  RAINFALL INTENSITY(INCH/HR) =   0.50
  AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.90
  EFFECTIVE STREAM AREA(ACRES) =     200.33
  TOTAL STREAM AREA(ACRES) =     200.33
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.02
```

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1303.52	32.02	0.568	0.60(0.57)	0.95	3126.6	13810.00
1	1302.81	35.02	0.543	0.60(0.57)	0.95	3451.4	13850.00
1	1293.95	53.78	0.429	0.60(0.58)	0.96	5415.0	21000.00
1	1271.04	65.27	0.391	0.60(0.58)	0.96	7524.9	10400.00
1	1271.27	65.33	0.390	0.60(0.58)	0.96	7538.3	13830.00
1	1365.79	90.98	0.336	0.60(0.58)	0.97	13087.5	30100.00
1	1187.47	108.07	0.311	0.60(0.58)	0.96	16666.9	20200.00
1	1108.99	120.62	0.292	0.60(0.58)	0.96	19225.8	13600.00
1	1023.68	139.02	0.277	0.60(0.57)	0.96	22967.3	13200.00
1	1060.06	161.13	0.259	0.60(0.57)	0.96	27219.9	11831.00
1	1146.40	183.21	0.243	0.60(0.57)	0.96	31689.8	11530.00
1	1206.91	201.93	0.236	0.60(0.58)	0.96	36037.3	11000.00
1	1291.91	223.28	0.228	0.60(0.58)	0.97	43046.5	10850.00
1	1203.48	239.77	0.222	0.60(0.58)	0.97	46554.7	11220.00
1	966.38	294.35	0.201	0.60(0.58)	0.97	54994.8	12410.00
1	912.37	327.95	0.189	0.60(0.58)	0.97	61073.1	12261.00
1	893.71	341.07	0.184	0.60(0.58)	0.97	62557.8	10410.00
1	875.63	353.49	0.179	0.60(0.58)	0.97	63663.6	12101.10
1	835.45	381.44	0.175	0.60(0.58)	0.97	66041.4	10200.00
1	815.99	395.10	0.174	0.60(0.58)	0.98	66981.0	12010.00
1	772.18	425.19	0.171	0.60(0.59)	0.98	67658.4	10210.00
1	710.28	475.50	0.166	0.60(0.59)	0.98	68160.2	12000.00
1	667.78	543.37	0.160	0.60(0.59)	0.98	68728.6	10100.00
2	9.02	40.83	0.498	0.60(0.54)	0.90	200.3	13870.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1311.58	32.02	0.568	0.60(0.57)	0.95	3283.7	13810.00
2	1311.25	35.02	0.543	0.60(0.57)	0.95	3623.2	13850.00
3	1309.08	40.83	0.498	0.60(0.57)	0.95	4260.3	13870.00
4	1301.72	53.78	0.429	0.60(0.57)	0.96	5615.4	21000.00
5	1278.11	65.27	0.391	0.60(0.58)	0.96	7725.2	10400.00
6	1278.34	65.33	0.390	0.60(0.58)	0.96	7738.6	13830.00
7	1371.87	90.98	0.336	0.60(0.58)	0.97	13287.8	30100.00
8	1193.09	108.07	0.311	0.60(0.58)	0.96	16867.2	20200.00
9	1114.28	120.62	0.292	0.60(0.58)	0.96	19426.1	13600.00
10	1028.70	139.02	0.277	0.60(0.57)	0.96	23167.6	13200.00
11	1064.75	161.13	0.259	0.60(0.57)	0.96	27420.3	11831.00
12	1150.79	183.21	0.243	0.60(0.57)	0.96	31890.1	11530.00
13	1211.19	201.93	0.236	0.60(0.58)	0.96	36237.6	11000.00
14	1296.03	223.28	0.228	0.60(0.58)	0.97	43246.8	10850.00
15	1207.49	239.77	0.222	0.60(0.58)	0.97	46755.0	11220.00
16	970.03	294.35	0.201	0.60(0.58)	0.97	55195.1	12410.00
17	915.79	327.95	0.189	0.60(0.58)	0.97	61273.4	12261.00
18	897.04	341.07	0.184	0.60(0.58)	0.97	62758.1	10410.00
19	878.87	353.49	0.179	0.60(0.58)	0.97	63863.9	12101.10
20	838.61	381.44	0.175	0.60(0.58)	0.97	66241.7	10200.00
21	819.14	395.10	0.174	0.60(0.58)	0.97	67181.4	12010.00
22	775.27	425.19	0.171	0.60(0.58)	0.98	67858.8	10210.00
23	713.29	475.50	0.166	0.60(0.59)	0.98	68360.5	12000.00

24	670.68	543.37	0.160	0.60(0.59)	0.98	68928.9	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1371.87 Tc(MIN.) = 90.98
EFFECTIVE AREA(ACRES) = 13287.82 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 68928.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

****
FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 120.57 DOWNSTREAM(FEET) = 119.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 1190.21 CHANNEL SLOPE = 0.0007
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.328
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.69	0.60	0.724	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.724
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1376.67
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.97
AVERAGE FLOW DEPTH(FEET) = 10.75 TRAVEL TIME(MIN.) = 5.00
Tc(MIN.) = 95.98
SUBAREA AREA(ACRES) = 117.69 SUBAREA RUNOFF(CFS) = 9.60
EFFECTIVE AREA(ACRES) = 13405.51 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 69046.6 PEAK FLOW RATE(CFS) = 1371.87
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.74 FLOW VELOCITY(FEET/SEC.) = 3.96
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1311.58	37.07	0.527	0.60(0.56)	0.94	3401.4	13810.00
2	1311.25	40.07	0.503	0.60(0.57)	0.94	3740.9	13850.00
3	1309.08	45.88	0.469	0.60(0.57)	0.95	4378.0	13870.00
4	1301.72	58.84	0.407	0.60(0.57)	0.95	5733.1	21000.00
5	1278.11	70.36	0.380	0.60(0.57)	0.96	7842.9	10400.00
6	1278.34	70.42	0.379	0.60(0.57)	0.96	7856.3	13830.00
7	1371.87	95.98	0.328	0.60(0.58)	0.96	13405.5	30100.00
8	1193.09	113.24	0.303	0.60(0.58)	0.96	16984.9	20200.00
9	1114.28	125.88	0.288	0.60(0.57)	0.96	19543.8	13600.00
10	1028.70	144.39	0.273	0.60(0.57)	0.95	23285.3	13200.00
11	1064.75	166.46	0.255	0.60(0.57)	0.96	27537.9	11831.00

```
    12     1150.79  188.44    0.241  0.60( 0.57) 0.96   32007.8   11530.00
    13     1211.19  207.09    0.234  0.60( 0.58) 0.96   36355.3   11000.00
    14     1296.03  228.36    0.226  0.60( 0.58) 0.97   43364.5   10850.00
    15     1207.49  244.94    0.220  0.60( 0.58) 0.97   46872.7   11220.00
    16      970.03  299.80    0.199  0.60( 0.58) 0.97   55312.8   12410.00
    17      915.79  333.48    0.187  0.60( 0.58) 0.97   61391.1   12261.00
    18      897.04  346.63    0.182  0.60( 0.58) 0.97   62875.8   10410.00
    19      878.87  359.08    0.177  0.60( 0.58) 0.97   63981.6   12101.10
    20      838.61  387.09    0.174  0.60( 0.58) 0.97   66359.4   10200.00
    21      819.14  400.78    0.173  0.60( 0.58) 0.97   67299.1   12010.00
    22      775.27  430.95    0.170  0.60( 0.58) 0.97   67976.5   10210.00
    23      713.29  481.39    0.166  0.60( 0.58) 0.97   68478.2   12000.00
    24      670.68  549.35    0.159  0.60( 0.58) 0.98   69046.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1371.87  Tc(MIN.) =   95.98
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =   13405.51

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   95.98
  RAINFALL INTENSITY(INCH/HR) =   0.33
  AREA-AVERAGED Fm(INCH/HR) =  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.96
  EFFECTIVE STREAM AREA(ACRES) =   13405.51
  TOTAL STREAM AREA(ACRES) =   69046.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1371.87

****************************************************************************
  FLOW PROCESS FROM NODE  13889.00 TO NODE  13890.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   447.89
  ELEVATION DATA: UPSTREAM(FEET) =    564.89  DOWNSTREAM(FEET) =    421.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.976
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.561
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                -        3.03      0.60     0.960     0    6.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.960
  SUBAREA RUNOFF(CFS) =      2.69
  TOTAL AREA(ACRES) =      3.03   PEAK FLOW RATE(CFS) =      2.69

****************************************************************************
  FLOW PROCESS FROM NODE  13890.00 TO NODE  13891.00 IS CODE =  51
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    421.92  DOWNSTREAM(FEET) =    392.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   435.33   CHANNEL SLOPE =  0.0673
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.365
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.12      0.60     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.42
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   1.64
  Tc(MIN.) =    8.62
  SUBAREA AREA(ACRES) =     8.12       SUBAREA RUNOFF(CFS) =    5.65
  EFFECTIVE AREA(ACRES) =     11.15     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       11.1          PEAK FLOW RATE(CFS) =       7.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   4.78
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13891.00 =     883.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13891.00 TO NODE  13892.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    392.64  DOWNSTREAM(FEET) =    324.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =   662.40   CHANNEL SLOPE =  0.1029
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.176
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       12.50      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.13
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =   10.42
  SUBAREA AREA(ACRES) =    12.50       SUBAREA RUNOFF(CFS) =    6.48
  EFFECTIVE AREA(ACRES) =     23.65     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       23.6          PEAK FLOW RATE(CFS) =      12.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   6.27
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13892.00 =    1545.62 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  13892.00 TO NODE  13893.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    324.46  DOWNSTREAM(FEET) =    240.82
 CHANNEL LENGTH THRU SUBAREA(FEET) =   980.03   CHANNEL SLOPE =  0.0853
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.030
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       15.87      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.22
 AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =   2.63
 Tc(MIN.) =   13.05
 SUBAREA AREA(ACRES) =    15.87       SUBAREA RUNOFF(CFS) =    6.15
 EFFECTIVE AREA(ACRES) =     39.52     AREA-AVERAGED Fm(INCH/HR) =   0.60
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =       39.5         PEAK FLOW RATE(CFS) =      15.44

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   6.20
 LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13893.00 =    2525.65 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13893.00 TO NODE  13894.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    240.82  DOWNSTREAM(FEET) =    163.04
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1144.35   CHANNEL SLOPE =  0.0680
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.882
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       28.41      0.60     0.985     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.985
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.20
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.00
 AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   3.18
 Tc(MIN.) =   16.23
 SUBAREA AREA(ACRES) =    28.41       SUBAREA RUNOFF(CFS) =    7.45
 EFFECTIVE AREA(ACRES) =     67.93     AREA-AVERAGED Fm(INCH/HR) =   0.59
 AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =      17.62

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   5.92
 LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13894.00 =    3670.00 FEET.
```



```
****************************************************************************
 FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   163.04  DOWNSTREAM(FEET) =   119.70
 FLOW LENGTH(FEET) =  1899.01   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  10.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.32
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      17.62
 PIPE TRAVEL TIME(MIN.) =   3.07    Tc(MIN.) =   19.29
 LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13910.00 =    5569.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   19.29
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.783
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       11.69      0.60     0.634     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.634
 SUBAREA AREA(ACRES) =   11.69      SUBAREA RUNOFF(CFS) =    4.24
 EFFECTIVE AREA(ACRES) =     79.62   AREA-AVERAGED Fm(INCH/HR) =  0.56
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.94
 TOTAL AREA(ACRES) =       79.6       PEAK FLOW RATE(CFS) =      17.62
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   19.29
 RAINFALL INTENSITY(INCH/HR) =   0.78
 AREA-AVERAGED Fm(INCH/HR) =  0.56
 AREA-AVERAGED Fp(INCH/HR) =  0.60
 AREA-AVERAGED Ap =  0.94
 EFFECTIVE STREAM AREA(ACRES) =      79.62
 TOTAL STREAM AREA(ACRES) =      79.62
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      17.62

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1311.58   37.07    0.527  0.60( 0.56) 0.94    3401.4   13810.00
     1     1311.25   40.07    0.503  0.60( 0.57) 0.94    3740.9   13850.00
```

1	1309.08	45.88	0.469	0.60(0.57)	0.95	4378.0	13870.00
1	1301.72	58.84	0.407	0.60(0.57)	0.95	5733.1	21000.00
1	1278.11	70.36	0.380	0.60(0.57)	0.96	7842.9	10400.00
1	1278.34	70.42	0.379	0.60(0.57)	0.96	7856.3	13830.00
1	1371.87	95.98	0.328	0.60(0.58)	0.96	13405.5	30100.00
1	1193.09	113.24	0.303	0.60(0.58)	0.96	16984.9	20200.00
1	1114.28	125.88	0.288	0.60(0.57)	0.96	19543.8	13600.00
1	1028.70	144.39	0.273	0.60(0.57)	0.95	23285.3	13200.00
1	1064.75	166.46	0.255	0.60(0.57)	0.96	27537.9	11831.00
1	1150.79	188.44	0.241	0.60(0.57)	0.96	32007.8	11530.00
1	1211.19	207.09	0.234	0.60(0.58)	0.96	36355.3	11000.00
1	1296.03	228.36	0.226	0.60(0.58)	0.97	43364.5	10850.00
1	1207.49	244.94	0.220	0.60(0.58)	0.97	46872.7	11220.00
1	970.03	299.80	0.199	0.60(0.58)	0.97	55312.8	12410.00
1	915.79	333.48	0.187	0.60(0.58)	0.97	61391.1	12261.00
1	897.04	346.63	0.182	0.60(0.58)	0.97	62875.8	10410.00
1	878.87	359.08	0.177	0.60(0.58)	0.97	63981.6	12101.10
1	838.61	387.09	0.174	0.60(0.58)	0.97	66359.4	10200.00
1	819.14	400.78	0.173	0.60(0.58)	0.97	67299.1	12010.00
1	775.27	430.95	0.170	0.60(0.58)	0.97	67976.5	10210.00
1	713.29	481.39	0.166	0.60(0.58)	0.97	68478.2	12000.00
1	670.68	549.35	0.159	0.60(0.58)	0.98	69046.6	10100.00
2	17.62	19.29	0.783	0.60(0.56)	0.94	79.6	13889.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1329.21	19.29	0.783	0.60(0.56)	0.94	1849.8	13889.00
2	1314.20	37.07	0.527	0.60(0.56)	0.94	3481.0	13810.00
3	1313.74	40.07	0.503	0.60(0.57)	0.94	3820.5	13850.00
4	1311.41	45.88	0.469	0.60(0.57)	0.95	4457.6	13870.00
5	1303.74	58.84	0.407	0.60(0.57)	0.95	5812.7	21000.00
6	1280.00	70.36	0.380	0.60(0.57)	0.96	7922.6	10400.00
7	1280.22	70.42	0.379	0.60(0.57)	0.96	7935.9	13830.00
8	1373.50	95.98	0.328	0.60(0.58)	0.96	13485.1	30100.00
9	1194.59	113.24	0.303	0.60(0.58)	0.96	17064.5	20200.00
10	1115.71	125.88	0.288	0.60(0.57)	0.96	19623.4	13600.00
11	1030.06	144.39	0.273	0.60(0.57)	0.95	23364.9	13200.00
12	1066.02	166.46	0.255	0.60(0.57)	0.96	27617.6	11831.00
13	1151.99	188.44	0.241	0.60(0.57)	0.96	32087.4	11530.00
14	1212.35	207.09	0.234	0.60(0.58)	0.96	36434.9	11000.00
15	1297.16	228.36	0.226	0.60(0.58)	0.97	43444.1	10850.00
16	1208.58	244.94	0.220	0.60(0.58)	0.97	46952.3	11220.00
17	971.02	299.80	0.199	0.60(0.58)	0.97	55392.4	12410.00
18	916.72	333.48	0.187	0.60(0.58)	0.97	61470.7	12261.00
19	897.95	346.63	0.182	0.60(0.58)	0.97	62955.4	10410.00
20	879.75	359.08	0.177	0.60(0.58)	0.97	64061.2	12101.10
21	839.48	387.09	0.174	0.60(0.58)	0.97	66439.0	10200.00
22	820.00	400.78	0.173	0.60(0.58)	0.97	67378.7	12010.00
23	776.12	430.95	0.170	0.60(0.58)	0.97	68056.1	10210.00
24	714.11	481.39	0.166	0.60(0.58)	0.97	68557.8	12000.00
25	671.47	549.35	0.159	0.60(0.58)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1373.50 Tc(MIN.) = 95.98

EFFECTIVE AREA(ACRES) = 13485.13 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 69126.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 69126.2 TC(MIN.) = 95.98
EFFECTIVE AREA(ACRES) = 13485.13 AREA-AVERAGED Fm(INCH/HR)= 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.963
PEAK FLOW RATE(CFS) = 1373.50

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1329.21	19.29	0.783	0.60(0.56)	0.94	1849.8	13889.00
2	1314.20	37.07	0.527	0.60(0.56)	0.94	3481.0	13810.00
3	1313.74	40.07	0.503	0.60(0.57)	0.94	3820.5	13850.00
4	1311.41	45.88	0.469	0.60(0.57)	0.95	4457.6	13870.00
5	1303.74	58.84	0.407	0.60(0.57)	0.95	5812.7	21000.00
6	1280.00	70.36	0.380	0.60(0.57)	0.96	7922.6	10400.00
7	1280.22	70.42	0.379	0.60(0.57)	0.96	7935.9	13830.00
8	1373.50	95.98	0.328	0.60(0.58)	0.96	13485.1	30100.00
9	1194.59	113.24	0.303	0.60(0.58)	0.96	17064.5	20200.00
10	1115.71	125.88	0.288	0.60(0.57)	0.96	19623.4	13600.00
11	1030.06	144.39	0.273	0.60(0.57)	0.95	23364.9	13200.00
12	1066.02	166.46	0.255	0.60(0.57)	0.96	27617.6	11831.00
13	1151.99	188.44	0.241	0.60(0.57)	0.96	32087.4	11530.00
14	1212.35	207.09	0.234	0.60(0.58)	0.96	36434.9	11000.00
15	1297.16	228.36	0.226	0.60(0.58)	0.97	43444.1	10850.00
16	1208.58	244.94	0.220	0.60(0.58)	0.97	46952.3	11220.00
17	971.02	299.80	0.199	0.60(0.58)	0.97	55392.4	12410.00
18	916.72	333.48	0.187	0.60(0.58)	0.97	61470.7	12261.00
19	897.95	346.63	0.182	0.60(0.58)	0.97	62955.4	10410.00
20	879.75	359.08	0.177	0.60(0.58)	0.97	64061.2	12101.10
21	839.48	387.09	0.174	0.60(0.58)	0.97	66439.0	10200.00
22	820.00	400.78	0.173	0.60(0.58)	0.97	67378.7	12010.00
23	776.12	430.95	0.170	0.60(0.58)	0.97	68056.1	10210.00
24	714.11	481.39	0.166	0.60(0.58)	0.97	68557.8	12000.00
25	671.47	549.35	0.159	0.60(0.58)	0.98	69126.2	10100.00

END OF RATIONAL METHOD ANALYSIS

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                           Analysis prepared by:

                         Michael Baker International
                       5 Hutton Centre Drive, Suite 500
                                Santa Ana, CA
                                    92707

 ------------------------------------------------------------------------
  FILE NAME: S39.DAT
  TIME/DATE OF STUDY: 08:06 07/16/2018
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                      --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  1.797
   2)   10.00;  1.198
   3)   15.00;  0.921
   4)   20.00;  0.760
   5)   25.00;  0.658
   6)   30.00;  0.584
   7)   40.00;  0.503
   8)   50.00;  0.446
   9)   60.00;  0.402
  10)   90.00;  0.337
  11)  120.00;  0.293
  12)  180.00;  0.244
  13)  360.00;  0.177
  14) 1440.00;  0.077
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  13900.00 TO NODE  13901.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   600.65
  ELEVATION DATA: UPSTREAM(FEET) =    442.40  DOWNSTREAM(FEET) =    385.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.859
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  AGRICULTURAL POOR COVER
  "FALLOW"                   -        4.00      0.60     1.000     0   10.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.98
  TOTAL AREA(ACRES) =      4.00   PEAK FLOW RATE(CFS) =      1.98

 ************************************************************************
  FLOW PROCESS FROM NODE  13901.00 TO NODE  13902.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    385.16  DOWNSTREAM(FEET) =    288.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   647.42   CHANNEL SLOPE =  0.1497
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.039
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.47      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.35
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   2.02
  Tc(MIN.) =   12.88
  SUBAREA AREA(ACRES) =     8.47       SUBAREA RUNOFF(CFS) =    3.35
  EFFECTIVE AREA(ACRES) =     12.47     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.5         PEAK FLOW RATE(CFS) =       4.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   5.69
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13902.00 =    1248.07 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  13902.00 TO NODE  13903.00 IS CODE =  51
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    288.21  DOWNSTREAM(FEET) =    184.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   669.27   CHANNEL SLOPE =  0.1544
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.947
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.85      0.60     0.982     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.982
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.74
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   1.65
  Tc(MIN.) =   14.53
  SUBAREA AREA(ACRES) =    23.85       SUBAREA RUNOFF(CFS) =    7.68
  EFFECTIVE AREA(ACRES) =     36.32     AREA-AVERAGED Fm(INCH/HR) =   0.59
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       36.3         PEAK FLOW RATE(CFS) =      11.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.73   FLOW VELOCITY(FEET/SEC.) =   7.25
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13903.00 =    1917.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   184.89  DOWNSTREAM(FEET) =   155.08
  FLOW LENGTH(FEET) =   876.66   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.53
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.58
  PIPE TRAVEL TIME(MIN.) =   1.39    Tc(MIN.) =   15.92
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13904.00 =    2794.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.92
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.891
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.29      0.60     0.996     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.996
  SUBAREA AREA(ACRES) =   21.29      SUBAREA RUNOFF(CFS) =    5.63
  EFFECTIVE AREA(ACRES) =     57.61   AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =       57.6       PEAK FLOW RATE(CFS) =      15.40
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.08  DOWNSTREAM(FEET) =   118.00
  FLOW LENGTH(FEET) =  1961.38   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  10.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.28
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.40
  PIPE TRAVEL TIME(MIN.) =   3.52    Tc(MIN.) =   19.44
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.44
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.778
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.53      0.60     0.649     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.649
  SUBAREA AREA(ACRES) =   43.53      SUBAREA RUNOFF(CFS) =   15.23
  EFFECTIVE AREA(ACRES) =    101.14   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =      101.1       PEAK FLOW RATE(CFS) =      24.74

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S38.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae      HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1329.21   19.29  0.60( 0.56) 0.94    1849.8   13889.00
      2     1314.20   37.07  0.60( 0.56) 0.94    3481.0   13810.00
      3     1303.74   58.84  0.60( 0.57) 0.95    5812.7   21000.00
      4     1373.50   95.98  0.60( 0.58) 0.96   13485.1   30100.00
      5     1194.59  113.24  0.60( 0.58) 0.96   17064.5   20200.00
      6     1115.71  125.88  0.60( 0.57) 0.96   19623.4   13600.00
      7     1030.06  144.39  0.60( 0.57) 0.95   23364.9   13200.00
      8     1066.02  166.46  0.60( 0.57) 0.96   27617.6   11831.00
      9     1151.99  188.44  0.60( 0.57) 0.96   32087.4   11530.00
```

```
     10     1212.35  207.09  0.60( 0.58) 0.96   36434.9   11000.00
     11     1297.16  228.36  0.60( 0.58) 0.97   43444.1   10850.00
     12     1208.58  244.94  0.60( 0.58) 0.97   46952.3   11220.00
     13      971.02  299.80  0.60( 0.58) 0.97   55392.4   12410.00
     14      916.72  333.48  0.60( 0.58) 0.97   61470.7   12261.00
     15      897.95  346.63  0.60( 0.58) 0.97   62955.4   10410.00
     16      839.48  387.09  0.60( 0.58) 0.97   66439.0   10200.00
     17      820.00  400.78  0.60( 0.58) 0.97   67378.7   12010.00
     18      776.12  430.95  0.60( 0.58) 0.97   68056.1   10210.00
     19      714.11  481.39  0.60( 0.58) 0.97   68557.8   12000.00
     20      671.47  549.35  0.60( 0.58) 0.98   69126.2   10100.00
    TOTAL AREA(ACRES) =    69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1329.21   19.29  0.60( 0.56) 0.94    1849.8   13889.00
      2     1314.20   37.07  0.60( 0.56) 0.94    3481.0   13810.00
      3     1303.74   58.84  0.60( 0.57) 0.95    5812.7   21000.00
      4     1373.50   95.98  0.60( 0.58) 0.96   13485.1   30100.00
      5     1194.59  113.24  0.60( 0.58) 0.96   17064.5   20200.00
      6     1115.71  125.88  0.60( 0.57) 0.96   19623.4   13600.00
      7     1030.06  144.39  0.60( 0.57) 0.95   23364.9   13200.00
      8     1066.02  166.46  0.60( 0.57) 0.96   27617.6   11831.00
      9     1151.99  188.44  0.60( 0.57) 0.96   32087.4   11530.00
     10     1212.35  207.09  0.60( 0.58) 0.96   36434.9   11000.00
     11     1297.16  228.36  0.60( 0.58) 0.97   43444.1   10850.00
     12     1208.58  244.94  0.60( 0.58) 0.97   46952.3   11220.00
     13      971.02  299.80  0.60( 0.58) 0.97   55392.4   12410.00
     14      916.72  333.48  0.60( 0.58) 0.97   61470.7   12261.00
     15      897.95  346.63  0.60( 0.58) 0.97   62955.4   10410.00
     16      839.48  387.09  0.60( 0.58) 0.97   66439.0   10200.00
     17      820.00  400.78  0.60( 0.58) 0.97   67378.7   12010.00
     18      776.12  430.95  0.60( 0.58) 0.97   68056.1   10210.00
     19      714.11  481.39  0.60( 0.58) 0.97   68557.8   12000.00
     20      671.47  549.35  0.60( 0.58) 0.98   69126.2   10100.00
    TOTAL AREA(ACRES) =     69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    119.70  DOWNSTREAM(FEET) =    118.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1376.26   CHANNEL SLOPE =  0.0012
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.321
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED                -       96.09      0.60     0.535     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.535
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1379.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.83
  AVERAGE FLOW DEPTH(FEET) =   9.76   TRAVEL TIME(MIN.) =   4.75
  Tc(MIN.) =  100.72
  SUBAREA AREA(ACRES) =    96.09       SUBAREA RUNOFF(CFS) =   12.92
  EFFECTIVE AREA(ACRES) =  13581.22     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.96
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    69222.3         PEAK FLOW RATE(CFS) =    1373.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.74   FLOW VELOCITY(FEET/SEC.) =   4.83
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1329.21   24.07    0.677  0.60( 0.55) 0.92    1945.9   13889.00
      2     1314.20   41.86    0.492  0.60( 0.56) 0.93    3577.1   13810.00
      3     1303.74   63.65    0.394  0.60( 0.57) 0.95    5908.8   21000.00
      4     1373.50  100.72    0.321  0.60( 0.58) 0.96   13581.2   30100.00
      5     1194.59  118.15    0.296  0.60( 0.57) 0.96   17160.6   20200.00
      6     1115.71  130.88    0.284  0.60( 0.57) 0.96   19719.5   13600.00
      7     1030.06  149.49    0.269  0.60( 0.57) 0.95   23461.0   13200.00
      8     1066.02  171.51    0.251  0.60( 0.57) 0.95   27713.7   11831.00
      9     1151.99  193.39    0.239  0.60( 0.57) 0.96   32183.5   11530.00
     10     1212.35  211.98    0.232  0.60( 0.58) 0.96   36531.0   11000.00
     11     1297.16  233.17    0.224  0.60( 0.58) 0.97   43540.2   10850.00
     12     1208.58  249.84    0.218  0.60( 0.58) 0.97   47048.4   11220.00
     13      971.02  304.98    0.197  0.60( 0.58) 0.97   55488.5   12410.00
     14      916.72  338.73    0.185  0.60( 0.58) 0.97   61566.8   12261.00
     15      897.95  351.91    0.180  0.60( 0.58) 0.97   63051.5   10410.00
     16      839.48  392.46    0.174  0.60( 0.58) 0.97   66535.1   10200.00
     17      820.00  406.18    0.173  0.60( 0.58) 0.97   67474.8   12010.00
     18      776.12  436.43    0.170  0.60( 0.58) 0.97   68152.2   10210.00
     19      714.11  486.97    0.165  0.60( 0.58) 0.97   68653.9   12000.00
     20      671.47  555.02    0.159  0.60( 0.58) 0.97   69222.3   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1373.50  Tc(MIN.) =  100.72
  AREA-AVERAGED Fm(INCH/HR) =  0.58  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =   13581.22

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	1329.21	24.07	0.677	0.60(0.55)	0.92	1945.9	13889.00
2	1314.20	41.86	0.492	0.60(0.56)	0.93	3577.1	13810.00
3	1303.74	63.65	0.394	0.60(0.57)	0.95	5908.8	21000.00
4	1373.50	100.72	0.321	0.60(0.58)	0.96	13581.2	30100.00
5	1194.59	118.15	0.296	0.60(0.57)	0.96	17160.6	20200.00
6	1115.71	130.88	0.284	0.60(0.57)	0.96	19719.5	13600.00
7	1030.06	149.49	0.269	0.60(0.57)	0.95	23461.0	13200.00
8	1066.02	171.51	0.251	0.60(0.57)	0.95	27713.7	11831.00
9	1151.99	193.39	0.239	0.60(0.57)	0.96	32183.5	11530.00
10	1212.35	211.98	0.232	0.60(0.58)	0.96	36531.0	11000.00
11	1297.16	233.17	0.224	0.60(0.58)	0.97	43540.2	10850.00
12	1208.58	249.84	0.218	0.60(0.58)	0.97	47048.4	11220.00
13	971.02	304.98	0.197	0.60(0.58)	0.97	55488.5	12410.00
14	916.72	338.73	0.185	0.60(0.58)	0.97	61566.8	12261.00
15	897.95	351.91	0.180	0.60(0.58)	0.97	63051.5	10410.00
16	839.48	392.46	0.174	0.60(0.58)	0.97	66535.1	10200.00
17	820.00	406.18	0.173	0.60(0.58)	0.97	67474.8	12010.00
18	776.12	436.43	0.170	0.60(0.58)	0.97	68152.2	10210.00
19	714.11	486.97	0.165	0.60(0.58)	0.97	68653.9	12000.00
20	671.47	555.02	0.159	0.60(0.58)	0.97	69222.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24.74	19.44	0.778	0.60(0.51)	0.84	101.1	13900.00

LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1353.95	19.44	0.778	0.60(0.55)	0.92	1672.7	13900.00
2	1344.75	24.07	0.677	0.60(0.55)	0.92	2047.0	13889.00
3	1321.20	41.86	0.492	0.60(0.56)	0.93	3678.2	13810.00
4	1309.34	63.65	0.394	0.60(0.57)	0.94	6009.9	21000.00
5	1378.07	100.72	0.321	0.60(0.58)	0.96	13682.4	30100.00
6	1198.80	118.15	0.296	0.60(0.57)	0.96	17261.8	20200.00
7	1119.75	130.88	0.284	0.60(0.57)	0.96	19820.6	13600.00
8	1033.88	149.49	0.269	0.60(0.57)	0.95	23562.1	13200.00
9	1069.59	171.51	0.251	0.60(0.57)	0.95	27814.8	11831.00
10	1155.39	193.39	0.239	0.60(0.57)	0.96	32284.6	11530.00
11	1215.65	211.98	0.232	0.60(0.58)	0.96	36632.2	11000.00
12	1300.34	233.17	0.224	0.60(0.58)	0.97	43641.3	10850.00
13	1211.68	249.84	0.218	0.60(0.58)	0.97	47149.5	11220.00
14	973.82	304.98	0.197	0.60(0.58)	0.97	55589.6	12410.00
15	919.34	338.73	0.185	0.60(0.58)	0.97	61667.9	12261.00
16	900.50	351.91	0.180	0.60(0.58)	0.97	63152.7	10410.00
17	841.95	392.46	0.174	0.60(0.58)	0.97	66636.2	10200.00
18	822.45	406.18	0.173	0.60(0.58)	0.97	67575.9	12010.00
19	778.54	436.43	0.170	0.60(0.58)	0.97	68253.3	10210.00
20	716.46	486.97	0.165	0.60(0.58)	0.97	68755.0	12000.00
21	673.73	555.02	0.159	0.60(0.58)	0.97	69323.4	10100.00

TOTAL AREA(ACRES) = 69323.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1378.07 Tc(MIN.) = 100.723
EFFECTIVE AREA(ACRES) = 13682.36 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 69323.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

****
FLOW PROCESS FROM NODE 13920.00 TO NODE 13921.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 118.00 DOWNSTREAM(FEET) = 115.28
CHANNEL LENGTH THRU SUBAREA(FEET) = 335.44 CHANNEL SLOPE = 0.0081
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.320
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.30	0.60	0.658	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1384.69
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.80
AVERAGE FLOW DEPTH(FEET) = 6.86 TRAVEL TIME(MIN.) = 0.57
Tc(MIN.) = 101.29
SUBAREA AREA(ACRES) = 134.30 SUBAREA RUNOFF(CFS) = 13.25
EFFECTIVE AREA(ACRES) = 13816.66 AREA-AVERAGED Fm(INCH/HR) = 0.57
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 69457.7 PEAK FLOW RATE(CFS) = 1378.07
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.85 FLOW VELOCITY(FEET/SEC.) = 9.79
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13921.00 = 136971.39 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1353.95	20.01	0.760	0.60(0.54)	0.90	1807.0	13900.00
2	1344.75	24.64	0.665	0.60(0.54)	0.90	2181.3	13889.00
3	1321.20	42.44	0.489	0.60(0.55)	0.92	3812.5	13810.00
4	1309.34	64.22	0.393	0.60(0.56)	0.94	6144.2	21000.00
5	1378.07	101.29	0.320	0.60(0.57)	0.96	13816.7	30100.00
6	1198.80	118.74	0.295	0.60(0.57)	0.95	17396.1	20200.00
7	1119.75	131.48	0.284	0.60(0.57)	0.95	19954.9	13600.00
8	1033.88	150.10	0.268	0.60(0.57)	0.95	23696.4	13200.00
9	1069.59	172.12	0.250	0.60(0.57)	0.95	27949.1	11831.00
10	1155.39	193.99	0.239	0.60(0.57)	0.95	32418.9	11530.00
11	1215.65	212.57	0.232	0.60(0.57)	0.96	36766.5	11000.00
12	1300.34	233.75	0.224	0.60(0.58)	0.96	43775.6	10850.00
13	1211.68	250.43	0.218	0.60(0.58)	0.97	47283.8	11220.00
14	973.82	305.60	0.197	0.60(0.58)	0.97	55723.9	12410.00
15	919.34	339.36	0.185	0.60(0.58)	0.97	61802.2	12261.00
16	900.50	352.54	0.180	0.60(0.58)	0.97	63287.0	10410.00
17	841.95	393.10	0.174	0.60(0.58)	0.97	66770.5	10200.00

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    18      822.45  406.83    0.173  0.60( 0.58) 0.97   67710.2   12010.00
    19      778.54  437.08    0.170  0.60( 0.58) 0.97   68387.6   10210.00
    20      716.46  487.64    0.165  0.60( 0.58) 0.97   68889.3   12000.00
    21      673.73  555.70    0.159  0.60( 0.58) 0.97   69457.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1378.07  Tc(MIN.) =  101.29
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =   13816.66

****************************************************************************
  FLOW PROCESS FROM NODE  13921.00 TO NODE  14010.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    115.28  DOWNSTREAM(FEET) =    100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1396.08   CHANNEL SLOPE =  0.0109
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.317
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.27      0.60     0.723     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.723
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1381.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.96
  AVERAGE FLOW DEPTH(FEET) =   6.48   TRAVEL TIME(MIN.) =   2.12
  Tc(MIN.) =  103.42
  SUBAREA AREA(ACRES) =    96.27       SUBAREA RUNOFF(CFS) =    7.62
  EFFECTIVE AREA(ACRES) =  13912.93     AREA-AVERAGED Fm(INCH/HR) =   0.57
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.96
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =    69554.0         PEAK FLOW RATE(CFS) =    1378.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.47   FLOW VELOCITY(FEET/SEC.) =  10.96
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  14010.00 =  138367.47 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1353.95   22.14    0.716  0.60( 0.53) 0.89    1903.3   13900.00
      2     1344.75   26.78    0.632  0.60( 0.54) 0.89    2277.6   13889.00
      3     1321.20   44.58    0.477  0.60( 0.55) 0.91    3908.8   13810.00
      4     1309.34   66.37    0.388  0.60( 0.56) 0.93    6240.5   21000.00
      5     1378.07  103.42    0.317  0.60( 0.57) 0.96   13912.9   30100.00
      6     1198.80  120.94    0.292  0.60( 0.57) 0.95   17492.3   20200.00
      7     1119.75  133.71    0.282  0.60( 0.57) 0.95   20051.2   13600.00
      8     1033.88  152.38    0.267  0.60( 0.57) 0.95   23792.7   13200.00
      9     1069.59  174.38    0.249  0.60( 0.57) 0.95   28045.4   11831.00
     10     1155.39  196.21    0.238  0.60( 0.57) 0.95   32515.2   11530.00
     11     1215.65  214.76    0.231  0.60( 0.57) 0.96   36862.7   11000.00
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     12     1300.34  235.90    0.223  0.60( 0.58) 0.96   43871.9   10850.00
     13     1211.68  252.62    0.217  0.60( 0.58) 0.97   47380.1   11220.00
     14      973.82  307.92    0.196  0.60( 0.58) 0.97   55820.2   12410.00
     15      919.34  341.71    0.184  0.60( 0.58) 0.97   61898.5   12261.00
     16      900.50  354.90    0.179  0.60( 0.58) 0.97   63383.2   10410.00
     17      841.95  395.50    0.174  0.60( 0.58) 0.97   66866.8   10200.00
     18      822.45  409.25    0.172  0.60( 0.58) 0.97   67806.5   12010.00
     19      778.54  439.53    0.170  0.60( 0.58) 0.97   68483.9   10210.00
     20      716.46  490.14    0.165  0.60( 0.58) 0.97   68985.6   12000.00
     21      673.73  558.24    0.159  0.60( 0.58) 0.97   69554.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1378.07  Tc(MIN.) =  103.42
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.60
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =   13912.93
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    69554.0  TC(MIN.) =    103.42
  EFFECTIVE AREA(ACRES) =  13912.93  AREA-AVERAGED Fm(INCH/HR)=  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.955
  PEAK FLOW RATE(CFS)   =    1378.07

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1353.95   22.14    0.716  0.60( 0.53) 0.89    1903.3   13900.00
      2     1344.75   26.78    0.632  0.60( 0.54) 0.89    2277.6   13889.00
      3     1321.20   44.58    0.477  0.60( 0.55) 0.91    3908.8   13810.00
      4     1309.34   66.37    0.388  0.60( 0.56) 0.93    6240.5   21000.00
      5     1378.07  103.42    0.317  0.60( 0.57) 0.96   13912.9   30100.00
      6     1198.80  120.94    0.292  0.60( 0.57) 0.95   17492.3   20200.00
      7     1119.75  133.71    0.282  0.60( 0.57) 0.95   20051.2   13600.00
      8     1033.88  152.38    0.267  0.60( 0.57) 0.95   23792.7   13200.00
      9     1069.59  174.38    0.249  0.60( 0.57) 0.95   28045.4   11831.00
     10     1155.39  196.21    0.238  0.60( 0.57) 0.95   32515.2   11530.00
     11     1215.65  214.76    0.231  0.60( 0.57) 0.96   36862.7   11000.00
     12     1300.34  235.90    0.223  0.60( 0.58) 0.96   43871.9   10850.00
     13     1211.68  252.62    0.217  0.60( 0.58) 0.97   47380.1   11220.00
     14      973.82  307.92    0.196  0.60( 0.58) 0.97   55820.2   12410.00
     15      919.34  341.71    0.184  0.60( 0.58) 0.97   61898.5   12261.00
     16      900.50  354.90    0.179  0.60( 0.58) 0.97   63383.2   10410.00
     17      841.95  395.50    0.174  0.60( 0.58) 0.97   66866.8   10200.00
     18      822.45  409.25    0.172  0.60( 0.58) 0.97   67806.5   12010.00
     19      778.54  439.53    0.170  0.60( 0.58) 0.97   68483.9   10210.00
     20      716.46  490.14    0.165  0.60( 0.58) 0.97   68985.6   12000.00
     21      673.73  558.24    0.159  0.60( 0.58) 0.97   69554.0   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S1.DAT
  TIME/DATE OF STUDY: 10:29 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.309
   2)   10.00;  2.128
   3)   15.00;  1.452
   4)   20.00;  1.250
   5)   25.00;  1.077
   6)   30.00;  0.947
   7)   40.00;  0.827
   8)   50.00;  0.743
   9)   60.00;  0.687
  10)   90.00;  0.588
  11)  120.00;  0.539
  12)  180.00;  0.462
  13)  360.00;  0.360
  14) 1440.00;  0.163
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10100.00 TO NODE  10101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   934.06
  ELEVATION DATA: UPSTREAM(FEET) =   3351.52  DOWNSTREAM(FEET) =   3172.56

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.446
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        3.55      0.50     1.000     0   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.02
  TOTAL AREA(ACRES) =      3.55   PEAK FLOW RATE(CFS) =      3.02

**************************************************************************
  FLOW PROCESS FROM NODE  10101.00 TO NODE  10102.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3172.56  DOWNSTREAM(FEET) =   3090.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   942.40   CHANNEL SLOPE =  0.0870
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.292
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       19.22      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.12
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   18.96
  SUBAREA AREA(ACRES) =    19.22       SUBAREA RUNOFF(CFS) =   13.69
  EFFECTIVE AREA(ACRES) =     22.77     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.8         PEAK FLOW RATE(CFS) =      16.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   4.65
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10102.00 =    1876.46 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10102.00 TO NODE  10103.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   3090.55  DOWNSTREAM(FEET) =   3022.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   920.65   CHANNEL SLOPE =  0.0740
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.174
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.77
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =   22.18
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   13.06
  EFFECTIVE AREA(ACRES) =     44.29     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       44.3         PEAK FLOW RATE(CFS) =      26.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.34   FLOW VELOCITY(FEET/SEC.) =   4.99
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10103.00 =    2797.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10103.00 TO NODE  10104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3022.44  DOWNSTREAM(FEET) =   2962.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.87   CHANNEL SLOPE =  0.0612
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.076
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      126.78      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.67
  AVERAGE FLOW DEPTH(FEET) =   1.87   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   25.05
  SUBAREA AREA(ACRES) =   126.78       SUBAREA RUNOFF(CFS) =   65.65
  EFFECTIVE AREA(ACRES) =    171.07     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.1         PEAK FLOW RATE(CFS) =      88.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.17   FLOW VELOCITY(FEET/SEC.) =   6.26
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10104.00 =    3774.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10104.00 TO NODE  10105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.57  DOWNSTREAM(FEET) =   2917.85
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.94   CHANNEL SLOPE =  0.0240
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.926
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.68      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     110.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.65
  AVERAGE FLOW DEPTH(FEET) =   2.81   TRAVEL TIME(MIN.) =   6.69
  Tc(MIN.) =   31.74
  SUBAREA AREA(ACRES) =   112.68       SUBAREA RUNOFF(CFS) =   43.19
  EFFECTIVE AREA(ACRES) =    283.75     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      283.8         PEAK FLOW RATE(CFS) =     108.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.80   FLOW VELOCITY(FEET/SEC.) =   4.63
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.00 =    5639.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.00 TO NODE  10105.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2917.85  DOWNSTREAM(FEET) =   2880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1406.97   CHANNEL SLOPE =  0.0269
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.871
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      183.39      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     139.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.15
  AVERAGE FLOW DEPTH(FEET) =   3.00   TRAVEL TIME(MIN.) =   4.55
  Tc(MIN.) =   36.30
  SUBAREA AREA(ACRES) =   183.39       SUBAREA RUNOFF(CFS) =   61.28
  EFFECTIVE AREA(ACRES) =    467.14     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      467.1         PEAK FLOW RATE(CFS) =     156.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.13   FLOW VELOCITY(FEET/SEC.) =   5.30
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.50 =    7046.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.50 TO NODE  10106.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2880.00  DOWNSTREAM(FEET) =   2868.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1701.11   CHANNEL SLOPE =  0.0070
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.784
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.63      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     163.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.23
  AVERAGE FLOW DEPTH(FEET) =   4.11   TRAVEL TIME(MIN.) =   8.77
  Tc(MIN.) =   45.06
  SUBAREA AREA(ACRES) =    60.63       SUBAREA RUNOFF(CFS) =   15.51
  EFFECTIVE AREA(ACRES) =    527.77     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      527.8         PEAK FLOW RATE(CFS) =     156.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.04   FLOW VELOCITY(FEET/SEC.) =   3.19
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10106.00 =    8748.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10106.00 TO NODE  10107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2868.10  DOWNSTREAM(FEET) =   2781.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2951.00   CHANNEL SLOPE =  0.0294
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.721
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.11      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     168.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.58
  AVERAGE FLOW DEPTH(FEET) =   3.17   TRAVEL TIME(MIN.) =   8.81
  Tc(MIN.) =   53.87
  SUBAREA AREA(ACRES) =   123.11       SUBAREA RUNOFF(CFS) =   24.50
  EFFECTIVE AREA(ACRES) =    650.88     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.9         PEAK FLOW RATE(CFS) =     156.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.09   FLOW VELOCITY(FEET/SEC.) =   5.47
```



```
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10107.00 =   11699.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10107.00 TO NODE  10108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2781.28  DOWNSTREAM(FEET) =   2725.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2630.56   CHANNEL SLOPE =  0.0213
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.678
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      186.62      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     171.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.96
  AVERAGE FLOW DEPTH(FEET) =   3.39   TRAVEL TIME(MIN.) =   8.84
  Tc(MIN.) =   62.71
  SUBAREA AREA(ACRES) =   186.62       SUBAREA RUNOFF(CFS) =   29.87
  EFFECTIVE AREA(ACRES) =    837.50     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      837.5         PEAK FLOW RATE(CFS) =     156.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.28   FLOW VELOCITY(FEET/SEC.) =   4.85
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10108.00 =   14329.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10108.00 TO NODE  10109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2725.20  DOWNSTREAM(FEET) =   2581.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2890.52   CHANNEL SLOPE =  0.0496
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.654
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.07      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     163.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.73
  AVERAGE FLOW DEPTH(FEET) =   2.85   TRAVEL TIME(MIN.) =   7.16
  Tc(MIN.) =   69.87
  SUBAREA AREA(ACRES) =   112.07       SUBAREA RUNOFF(CFS) =   15.56
  EFFECTIVE AREA(ACRES) =    949.57     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      949.6         PEAK FLOW RATE(CFS) =     156.09
```

```
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.80   FLOW VELOCITY(FEET/SEC.) =   6.66
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10109.00 =   17220.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10109.00 TO NODE  10110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.72  DOWNSTREAM(FEET) =   2367.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2877.15   CHANNEL SLOPE =  0.0744
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.634
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.21      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     164.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.86
  AVERAGE FLOW DEPTH(FEET) =   2.64   TRAVEL TIME(MIN.) =   6.10
  Tc(MIN.) =   75.97
  SUBAREA AREA(ACRES) =   145.21       SUBAREA RUNOFF(CFS) =   17.52
  EFFECTIVE AREA(ACRES) =   1094.78     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1094.8         PEAK FLOW RATE(CFS) =     156.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.59   FLOW VELOCITY(FEET/SEC.) =   7.75
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10110.00 =   20097.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10110.00 TO NODE  10111.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2367.59  DOWNSTREAM(FEET) =   2075.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2802.04   CHANNEL SLOPE =  0.1041
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.617
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.01      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     173.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.02
  AVERAGE FLOW DEPTH(FEET) =   2.54   TRAVEL TIME(MIN.) =   5.18
  Tc(MIN.) =   81.15
```



```
  SUBAREA AREA(ACRES) =   339.01       SUBAREA RUNOFF(CFS) =   35.70
  EFFECTIVE AREA(ACRES) =   1433.79     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1433.8         PEAK FLOW RATE(CFS) =     156.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.43   FLOW VELOCITY(FEET/SEC.) =   8.80
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10111.00 =   22899.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10111.00 TO NODE  10112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2075.82  DOWNSTREAM(FEET) =   2004.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3782.59   CHANNEL SLOPE =  0.0190
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.581
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      265.32      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     165.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.71
  AVERAGE FLOW DEPTH(FEET) =   3.42   TRAVEL TIME(MIN.) =  13.37
  Tc(MIN.) =   94.52
  SUBAREA AREA(ACRES) =   265.32       SUBAREA RUNOFF(CFS) =   19.20
  EFFECTIVE AREA(ACRES) =   1699.11     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1699.1         PEAK FLOW RATE(CFS) =     156.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.35   FLOW VELOCITY(FEET/SEC.) =   4.65
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.00 =   26681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10112.00 TO NODE  10112.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.03  DOWNSTREAM(FEET) =   1982.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1479.53   CHANNEL SLOPE =  0.0149
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.571
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      307.63      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     165.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.31
  AVERAGE FLOW DEPTH(FEET) =   3.58   TRAVEL TIME(MIN.) =   5.72
  Tc(MIN.) =  100.25
  SUBAREA AREA(ACRES) =   307.63       SUBAREA RUNOFF(CFS) =   19.67
  EFFECTIVE AREA(ACRES) =   2006.74     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.7         PEAK FLOW RATE(CFS) =     156.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.50   FLOW VELOCITY(FEET/SEC.) =   4.24
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.50 =   28161.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1982.04  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3416.13   CHANNEL SLOPE =  0.0165
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.550
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.40      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     158.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.42
  AVERAGE FLOW DEPTH(FEET) =   3.46   TRAVEL TIME(MIN.) =  12.87
  Tc(MIN.) =  113.12
  SUBAREA AREA(ACRES) =   127.40       SUBAREA RUNOFF(CFS) =    5.74
  EFFECTIVE AREA(ACRES) =   2134.14     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2134.1         PEAK FLOW RATE(CFS) =     156.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.44   FLOW VELOCITY(FEET/SEC.) =   4.40
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     2134.1  TC(MIN.) =    113.12
  EFFECTIVE AREA(ACRES) =   2134.14  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     156.09
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S2.DAT
  TIME/DATE OF STUDY: 10:29 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.320
   2)   10.00;  2.134
   3)   15.00;  1.454
   4)   20.00;  1.252
   5)   25.00;  1.079
   6)   30.00;  0.948
   7)   40.00;  0.828
   8)   50.00;  0.744
   9)   60.00;  0.688
  10)   90.00;  0.590
  11)  120.00;  0.540
  12)  180.00;  0.464
  13)  360.00;  0.361
  14) 1440.00;  0.164
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10200.00 TO NODE  10201.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   301.66
  ELEVATION DATA: UPSTREAM(FEET) =   3087.44  DOWNSTREAM(FEET) =   3031.53

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.204
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.09      0.50     1.000     0    9.71
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.67
  TOTAL AREA(ACRES) =      1.09   PEAK FLOW RATE(CFS) =      1.67

**************************************************************************
  FLOW PROCESS FROM NODE  10201.00 TO NODE  10202.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3031.53  DOWNSTREAM(FEET) =   2903.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   538.03   CHANNEL SLOPE =  0.2382
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.926
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.06      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.92
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   1.82
  Tc(MIN.) =   11.53
  SUBAREA AREA(ACRES) =     4.06       SUBAREA RUNOFF(CFS) =    5.21
  EFFECTIVE AREA(ACRES) =      5.15     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2         PEAK FLOW RATE(CFS) =       6.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   5.45
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10202.00 =     839.69 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10202.00 TO NODE  10203.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2903.38  DOWNSTREAM(FEET) =   2639.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1124.98   CHANNEL SLOPE =  0.2344
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.587
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.13      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.52
  AVERAGE FLOW DEPTH(FEET) =   1.04   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   14.02
  SUBAREA AREA(ACRES) =    36.13       SUBAREA RUNOFF(CFS) =   35.35
  EFFECTIVE AREA(ACRES) =     41.28     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.3         PEAK FLOW RATE(CFS) =      40.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   8.53
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10203.00 =    1964.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10203.00 TO NODE  10204.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2639.65  DOWNSTREAM(FEET) =   2444.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.75   CHANNEL SLOPE =  0.1026
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.309
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.14      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.92
  AVERAGE FLOW DEPTH(FEET) =   1.71   TRAVEL TIME(MIN.) =   4.57
  Tc(MIN.) =   18.59
  SUBAREA AREA(ACRES) =    56.14       SUBAREA RUNOFF(CFS) =   40.86
  EFFECTIVE AREA(ACRES) =     97.42     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =      70.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =   7.19
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10204.00 =    3862.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10204.00 TO NODE  10205.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2444.90  DOWNSTREAM(FEET) =   2245.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1973.02   CHANNEL SLOPE =  0.1010
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.169
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      264.47      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     150.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.62
  AVERAGE FLOW DEPTH(FEET) =   2.42   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   22.41
  SUBAREA AREA(ACRES) =   264.47       SUBAREA RUNOFF(CFS) =  159.12
  EFFECTIVE AREA(ACRES) =    361.89     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      361.9         PEAK FLOW RATE(CFS) =     217.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.77   FLOW VELOCITY(FEET/SEC.) =   9.44
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10205.00 =    5835.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10205.00 TO NODE  10206.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2245.64  DOWNSTREAM(FEET) =   2157.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1870.92   CHANNEL SLOPE =  0.0469
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.039
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      255.55      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     279.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.55
  AVERAGE FLOW DEPTH(FEET) =   3.51   TRAVEL TIME(MIN.) =   4.13
  Tc(MIN.) =   26.54
  SUBAREA AREA(ACRES) =   255.55       SUBAREA RUNOFF(CFS) =  123.86
  EFFECTIVE AREA(ACRES) =    617.44     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      617.4         PEAK FLOW RATE(CFS) =     299.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.61   FLOW VELOCITY(FEET/SEC.) =   7.67
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.00 =    7706.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.00 TO NODE  10206.50 IS CODE =  51
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2157.91  DOWNSTREAM(FEET) =   2119.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1453.59   CHANNEL SLOPE =  0.0266
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.944
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.47      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     327.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.35
  AVERAGE FLOW DEPTH(FEET) =   4.15   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   30.35
  SUBAREA AREA(ACRES) =   141.47       SUBAREA RUNOFF(CFS) =   56.47
  EFFECTIVE AREA(ACRES) =    758.91     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      758.9         PEAK FLOW RATE(CFS) =     302.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.03   FLOW VELOCITY(FEET/SEC.) =   6.21
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.50 =    9159.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2119.30  DOWNSTREAM(FEET) =   2093.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2020.48   CHANNEL SLOPE =  0.0129
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.860
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.39      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     320.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.81
  AVERAGE FLOW DEPTH(FEET) =   4.71   TRAVEL TIME(MIN.) =   7.00
  Tc(MIN.) =   37.36
  SUBAREA AREA(ACRES) =   105.39       SUBAREA RUNOFF(CFS) =   34.10
  EFFECTIVE AREA(ACRES) =    864.30     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      864.3         PEAK FLOW RATE(CFS) =     302.95
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.61   FLOW VELOCITY(FEET/SEC.) =   4.75
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10220.00 =   11180.43 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   37.36
  RAINFALL INTENSITY(INCH/HR) =   0.86
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     864.30
  TOTAL STREAM AREA(ACRES) =     864.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     302.95

****************************************************************************
  FLOW PROCESS FROM NODE  10210.00 TO NODE  10211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   890.82
  ELEVATION DATA: UPSTREAM(FEET) =   2966.08  DOWNSTREAM(FEET) =   2867.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.601
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.389
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        7.25      0.50     1.000     0   16.60
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.80
  TOTAL AREA(ACRES) =      7.25   PEAK FLOW RATE(CFS) =      5.80

****************************************************************************
  FLOW PROCESS FROM NODE  10211.00 TO NODE  10212.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2867.74  DOWNSTREAM(FEET) =   2763.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1682.06   CHANNEL SLOPE =  0.0618
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.130
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       33.02      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.05
```

```
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   6.93
  Tc(MIN.) =   23.53
  SUBAREA AREA(ACRES) =    33.02       SUBAREA RUNOFF(CFS) =   18.71
  EFFECTIVE AREA(ACRES) =     40.27     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.3         PEAK FLOW RATE(CFS) =      22.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =   4.49
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10212.00 =    2572.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10212.00 TO NODE  10213.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2763.75  DOWNSTREAM(FEET) =   2662.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1206.59   CHANNEL SLOPE =  0.0842
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.027
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       71.89      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.79
  AVERAGE FLOW DEPTH(FEET) =   1.52   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   27.00
  SUBAREA AREA(ACRES) =    71.89       SUBAREA RUNOFF(CFS) =   34.06
  EFFECTIVE AREA(ACRES) =    112.16     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      112.2         PEAK FLOW RATE(CFS) =      53.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.69   FLOW VELOCITY(FEET/SEC.) =   6.19
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10213.00 =    3779.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10213.00 TO NODE  10214.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2662.20  DOWNSTREAM(FEET) =   2520.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1783.17   CHANNEL SLOPE =  0.0793
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.932
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      182.61      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      88.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.90
  AVERAGE FLOW DEPTH(FEET) =   2.07   TRAVEL TIME(MIN.) =   4.31
  Tc(MIN.) =   31.31
  SUBAREA AREA(ACRES) =   182.61       SUBAREA RUNOFF(CFS) =   71.01
  EFFECTIVE AREA(ACRES) =    294.77     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      294.8         PEAK FLOW RATE(CFS) =     114.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.28   FLOW VELOCITY(FEET/SEC.) =   7.36
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10214.00 =    5562.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10214.00 TO NODE  10215.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2520.73  DOWNSTREAM(FEET) =   2270.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2774.20   CHANNEL SLOPE =  0.0901
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.864
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      156.94      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     140.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.12
  AVERAGE FLOW DEPTH(FEET) =   2.40   TRAVEL TIME(MIN.) =   5.69
  Tc(MIN.) =   37.00
  SUBAREA AREA(ACRES) =   156.94       SUBAREA RUNOFF(CFS) =   51.38
  EFFECTIVE AREA(ACRES) =    451.71     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      451.7         PEAK FLOW RATE(CFS) =     147.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.45   FLOW VELOCITY(FEET/SEC.) =   8.20
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10215.00 =    8336.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10215.00 TO NODE  10216.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2270.71  DOWNSTREAM(FEET) =   2151.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.75   CHANNEL SLOPE =  0.0592
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.814
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      130.62      0.50     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     166.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.21
  AVERAGE FLOW DEPTH(FEET) =   2.77   TRAVEL TIME(MIN.) =   4.67
  Tc(MIN.) =   41.67
  SUBAREA AREA(ACRES) =   130.62       SUBAREA RUNOFF(CFS) =   36.89
  EFFECTIVE AREA(ACRES) =    582.33     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      582.3         PEAK FLOW RATE(CFS) =     164.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.76   FLOW VELOCITY(FEET/SEC.) =   7.21
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.00 =   10356.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.00 TO NODE  10216.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2151.20  DOWNSTREAM(FEET) =   2120.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1242.42   CHANNEL SLOPE =  0.0246
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.781
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.25      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     170.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.24
  AVERAGE FLOW DEPTH(FEET) =   3.30   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   45.62
  SUBAREA AREA(ACRES) =    51.25       SUBAREA RUNOFF(CFS) =   12.94
  EFFECTIVE AREA(ACRES) =    633.58     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      633.6         PEAK FLOW RATE(CFS) =     164.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.25   FLOW VELOCITY(FEET/SEC.) =   5.18
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.50 =   11599.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2120.63  DOWNSTREAM(FEET) =   2093.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1301.06   CHANNEL SLOPE =  0.0210
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.744
  SUBAREA LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.16      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     167.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.91
  AVERAGE FLOW DEPTH(FEET) =   3.37   TRAVEL TIME(MIN.) =   4.41
  Tc(MIN.) =   50.04
  SUBAREA AREA(ACRES) =    26.16       SUBAREA RUNOFF(CFS) =    5.73
  EFFECTIVE AREA(ACRES) =    659.74     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      659.7         PEAK FLOW RATE(CFS) =     164.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.35   FLOW VELOCITY(FEET/SEC.) =   4.89
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   50.04
  RAINFALL INTENSITY(INCH/HR) =   0.74
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     659.74
  TOTAL STREAM AREA(ACRES) =     659.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     164.45

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      302.95   37.36    0.860  0.50( 0.50) 1.00     864.3   10200.00
      2      164.45   50.04    0.744  0.50( 0.50) 1.00     659.7   10210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      467.40   37.36    0.860  0.50( 0.50) 1.00    1356.9   10200.00
      2      369.72   50.04    0.744  0.50( 0.50) 1.00    1524.0   10210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     467.40    Tc(MIN.) =    37.36
  EFFECTIVE AREA(ACRES) =    1356.86   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1524.0
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  10220.00 TO NODE  10221.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2093.25  DOWNSTREAM(FEET) =   1965.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2966.11   CHANNEL SLOPE =  0.0430
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.801
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      104.45      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     481.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.36
  AVERAGE FLOW DEPTH(FEET) =   4.38   TRAVEL TIME(MIN.) =   5.91
  Tc(MIN.) =   43.27
  SUBAREA AREA(ACRES) =   104.45       SUBAREA RUNOFF(CFS) =   28.23
  EFFECTIVE AREA(ACRES) =   1461.31     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1628.5         PEAK FLOW RATE(CFS) =     467.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.33   FLOW VELOCITY(FEET/SEC.) =   8.31
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.00 =   15866.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.00 TO NODE  10221.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1965.76  DOWNSTREAM(FEET) =   1950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1346.48   CHANNEL SLOPE =  0.0117
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.764
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      169.50      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     487.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.15
  AVERAGE FLOW DEPTH(FEET) =   5.62   TRAVEL TIME(MIN.) =   4.36
  Tc(MIN.) =   47.63
  SUBAREA AREA(ACRES) =   169.50       SUBAREA RUNOFF(CFS) =   40.23
  EFFECTIVE AREA(ACRES) =   1630.81     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1798.0         PEAK FLOW RATE(CFS) =     467.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.53   FLOW VELOCITY(FEET/SEC.) =   5.10
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.50 =   17212.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1950.00  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1849.80   CHANNEL SLOPE =  0.0131
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.725
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.12      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     471.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.32
  AVERAGE FLOW DEPTH(FEET) =   5.43   TRAVEL TIME(MIN.) =   5.79
  Tc(MIN.) =   53.42
  SUBAREA AREA(ACRES) =    43.12       SUBAREA RUNOFF(CFS) =    8.72
  EFFECTIVE AREA(ACRES) =   1673.93     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1841.1         PEAK FLOW RATE(CFS) =     467.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.41   FLOW VELOCITY(FEET/SEC.) =   5.32
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1841.1  TC(MIN.) =     53.42
  EFFECTIVE AREA(ACRES) =   1673.93  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     467.40

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      467.40   53.42    0.725  0.50( 0.50) 1.00    1673.9   10200.00
      2      369.72   67.09    0.665  0.50( 0.50) 1.00    1841.1   10210.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:
```

```
--------------------------------------------------------------------------
  FILE NAME: S3.DAT
  TIME/DATE OF STUDY: 10:29 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.329
   2)   10.00;  2.139
   3)   15.00;  1.456
   4)   20.00;  1.254
   5)   25.00;  1.080
   6)   30.00;  0.949
   7)   40.00;  0.829
   8)   50.00;  0.745
   9)   60.00;  0.689
  10)   90.00;  0.591
  11)  120.00;  0.541
  12)  180.00;  0.465
  13)  360.00;  0.362
  14) 1440.00;  0.164
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10300.00 TO NODE  10301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.52
  ELEVATION DATA: UPSTREAM(FEET) =   4227.21  DOWNSTREAM(FEET) =   4064.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.977
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.620
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.00      0.50     1.000     0    7.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.91
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      1.91

**************************************************************************
  FLOW PROCESS FROM NODE  10301.00 TO NODE  10302.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4064.64  DOWNSTREAM(FEET) =   3797.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =   631.34   CHANNEL SLOPE =  0.4235
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.256
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.23      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.87
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   1.53
  Tc(MIN.) =    9.51
  SUBAREA AREA(ACRES) =     6.23       SUBAREA RUNOFF(CFS) =    9.84
  EFFECTIVE AREA(ACRES) =      7.23     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2         PEAK FLOW RATE(CFS) =      11.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   7.79
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10302.00 =     941.86 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10302.00 TO NODE  10303.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   3797.25  DOWNSTREAM(FEET) =   3447.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1908.89   CHANNEL SLOPE =  0.1834
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.595
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.83      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.12
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   4.47
  Tc(MIN.) =   13.98
  SUBAREA AREA(ACRES) =    32.83       SUBAREA RUNOFF(CFS) =   32.36
  EFFECTIVE AREA(ACRES) =     40.06     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =      39.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   7.70
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10303.00 =    2850.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10303.00 TO NODE  10304.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3447.07  DOWNSTREAM(FEET) =   3228.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.05   CHANNEL SLOPE =  0.1140
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.318
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.51      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      61.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.22
  AVERAGE FLOW DEPTH(FEET) =   1.69   TRAVEL TIME(MIN.) =   4.43
  Tc(MIN.) =   18.41
  SUBAREA AREA(ACRES) =    60.51       SUBAREA RUNOFF(CFS) =   44.55
  EFFECTIVE AREA(ACRES) =    100.57     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.6         PEAK FLOW RATE(CFS) =      74.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =   7.53
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10304.00 =    4768.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10304.00 TO NODE  10305.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3228.48  DOWNSTREAM(FEET) =   3118.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1679.40   CHANNEL SLOPE =  0.0656
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.166
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.56      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     109.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.77
  AVERAGE FLOW DEPTH(FEET) =   2.32   TRAVEL TIME(MIN.) =   4.13
  Tc(MIN.) =   22.54
  SUBAREA AREA(ACRES) =   116.56       SUBAREA RUNOFF(CFS) =   69.80
  EFFECTIVE AREA(ACRES) =    217.13     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      217.1         PEAK FLOW RATE(CFS) =     130.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.48   FLOW VELOCITY(FEET/SEC.) =   7.07
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10305.00 =    6448.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10305.00 TO NODE  10306.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3118.37  DOWNSTREAM(FEET) =   2807.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2853.67   CHANNEL SLOPE =  0.1088
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.008
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      189.23      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     173.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.16
  AVERAGE FLOW DEPTH(FEET) =   2.51   TRAVEL TIME(MIN.) =   5.19
  Tc(MIN.) =   27.73
  SUBAREA AREA(ACRES) =   189.23       SUBAREA RUNOFF(CFS) =   86.55
  EFFECTIVE AREA(ACRES) =    406.36     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      406.4         PEAK FLOW RATE(CFS) =     185.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.58   FLOW VELOCITY(FEET/SEC.) =   9.34
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10306.00 =    9301.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10306.00 TO NODE  10307.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2807.99  DOWNSTREAM(FEET) =   2591.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2848.03   CHANNEL SLOPE =  0.0759
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.912
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      416.51      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     263.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.90
  AVERAGE FLOW DEPTH(FEET) =   3.14   TRAVEL TIME(MIN.) =   5.33
  Tc(MIN.) =   33.07
  SUBAREA AREA(ACRES) =   416.51       SUBAREA RUNOFF(CFS) =  154.44
  EFFECTIVE AREA(ACRES) =    822.87     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      822.9         PEAK FLOW RATE(CFS) =     305.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.32   FLOW VELOCITY(FEET/SEC.) =   9.22
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10307.00 =   12149.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10307.00 TO NODE  10308.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2591.87  DOWNSTREAM(FEET) =   2516.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.06   CHANNEL SLOPE =  0.0263
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.825
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.49      0.50     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     353.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.44
  AVERAGE FLOW DEPTH(FEET) =   4.28   TRAVEL TIME(MIN.) =   7.41
  Tc(MIN.) =   40.48
  SUBAREA AREA(ACRES) =   320.49       SUBAREA RUNOFF(CFS) =   95.70
  EFFECTIVE AREA(ACRES) =   1143.36     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1143.4         PEAK FLOW RATE(CFS) =     336.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.20   FLOW VELOCITY(FEET/SEC.) =   6.36
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.00 =   15011.96 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10308.00 TO NODE  10308.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2516.62  DOWNSTREAM(FEET) =   2462.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.32   CHANNEL SLOPE =  0.0288
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.786
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.88      0.50     0.966     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.966
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     362.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.70
  AVERAGE FLOW DEPTH(FEET) =   4.24   TRAVEL TIME(MIN.) =   4.70
  Tc(MIN.) =   45.17
  SUBAREA AREA(ACRES) =   191.88       SUBAREA RUNOFF(CFS) =   52.21
  EFFECTIVE AREA(ACRES) =   1335.24     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1335.2         PEAK FLOW RATE(CFS) =     347.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.18   FLOW VELOCITY(FEET/SEC.) =   6.62
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.50 =   16901.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.50 TO NODE  10309.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.25  DOWNSTREAM(FEET) =   2409.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1874.33   CHANNEL SLOPE =  0.0279
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.746
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.14      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     357.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.61
  AVERAGE FLOW DEPTH(FEET) =   4.25   TRAVEL TIME(MIN.) =   4.72
  Tc(MIN.) =   49.90
  SUBAREA AREA(ACRES) =    90.14       SUBAREA RUNOFF(CFS) =   19.93
  EFFECTIVE AREA(ACRES) =   1425.38     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1425.4         PEAK FLOW RATE(CFS) =     347.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  4.21   FLOW VELOCITY(FEET/SEC.) =   6.55
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10309.00 =   18775.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2409.87  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2576.20   CHANNEL SLOPE =  0.0310
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.710
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.83      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     355.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.85
  AVERAGE FLOW DEPTH(FEET) =   4.16   TRAVEL TIME(MIN.) =   6.27
  Tc(MIN.) =   56.17
  SUBAREA AREA(ACRES) =    83.83       SUBAREA RUNOFF(CFS) =   15.86
  EFFECTIVE AREA(ACRES) =   1509.21     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1509.2         PEAK FLOW RATE(CFS) =     347.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.12   FLOW VELOCITY(FEET/SEC.) =   6.82
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   56.17
  RAINFALL INTENSITY(INCH/HR) =   0.71
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =    1509.21
  TOTAL STREAM AREA(ACRES) =    1509.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     347.84

****************************************************************************
  FLOW PROCESS FROM NODE  10320.00 TO NODE  10321.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.56
  ELEVATION DATA: UPSTREAM(FEET) =   3374.80  DOWNSTREAM(FEET) =   3300.24
```



```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.959
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.387
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.24      0.50     1.000     0    8.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.80
  TOTAL AREA(ACRES) =      2.24   PEAK FLOW RATE(CFS) =      3.80

****************************************************************************
  FLOW PROCESS FROM NODE  10321.00 TO NODE  10322.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3300.24  DOWNSTREAM(FEET) =   3187.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   581.07   CHANNEL SLOPE =  0.1945
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.025
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.01      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.17
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   1.87
  Tc(MIN.) =   10.83
  SUBAREA AREA(ACRES) =     5.01       SUBAREA RUNOFF(CFS) =    6.88
  EFFECTIVE AREA(ACRES) =      7.25     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2         PEAK FLOW RATE(CFS) =       9.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =   5.55
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10322.00 =     871.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10322.00 TO NODE  10323.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3187.21  DOWNSTREAM(FEET) =   3108.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.98   CHANNEL SLOPE =  0.0801
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.584
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -       30.37      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.05
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   3.23
  Tc(MIN.) =   14.06
  SUBAREA AREA(ACRES) =    30.37       SUBAREA RUNOFF(CFS) =   29.63
  EFFECTIVE AREA(ACRES) =     37.62     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.6          PEAK FLOW RATE(CFS) =      36.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   5.55
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10323.00 =    1849.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10323.00 TO NODE  10324.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3108.86  DOWNSTREAM(FEET) =   2923.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.11   CHANNEL SLOPE =  0.0966
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.303
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.88      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      61.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.78
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   4.73
  Tc(MIN.) =   18.79
  SUBAREA AREA(ACRES) =    68.88       SUBAREA RUNOFF(CFS) =   49.76
  EFFECTIVE AREA(ACRES) =    106.50     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.5         PEAK FLOW RATE(CFS) =      76.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.89   FLOW VELOCITY(FEET/SEC.) =   7.14
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10324.00 =    3773.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10324.00 TO NODE  10325.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2923.03  DOWNSTREAM(FEET) =   2675.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2788.58   CHANNEL SLOPE =  0.0889
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.086
  SUBAREA LOSS RATE DATA(AMC  II):
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```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      146.19      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     115.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.70
  AVERAGE FLOW DEPTH(FEET) =   2.24   TRAVEL TIME(MIN.) =   6.04
  Tc(MIN.) =   24.83
  SUBAREA AREA(ACRES) =   146.19       SUBAREA RUNOFF(CFS) =   77.08
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =     133.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.36   FLOW VELOCITY(FEET/SEC.) =   7.96
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10325.00 =    6562.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10325.00 TO NODE  10326.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2675.11  DOWNSTREAM(FEET) =   2541.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.28   CHANNEL SLOPE =  0.0465
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.928
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      321.78      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     195.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.88
  AVERAGE FLOW DEPTH(FEET) =   3.08   TRAVEL TIME(MIN.) =   6.93
  Tc(MIN.) =   31.76
  SUBAREA AREA(ACRES) =   321.78       SUBAREA RUNOFF(CFS) =  123.85
  EFFECTIVE AREA(ACRES) =    574.47     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      574.5         PEAK FLOW RATE(CFS) =     221.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.22   FLOW VELOCITY(FEET/SEC.) =   7.09
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.00 =    9424.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10326.00 TO NODE  10326.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2541.92  DOWNSTREAM(FEET) =   2438.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2617.40   CHANNEL SLOPE =  0.0394
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```

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*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.852
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -      187.06      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     250.74
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.86
AVERAGE FLOW DEPTH(FEET) =   3.49   TRAVEL TIME(MIN.) =   6.36
Tc(MIN.) =   38.12
SUBAREA AREA(ACRES) =   187.06       SUBAREA RUNOFF(CFS) =   59.16
EFFECTIVE AREA(ACRES) =    761.53     AREA-AVERAGED Fm(INCH/HR) =   0.50
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =      761.5         PEAK FLOW RATE(CFS) =     240.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  3.44   FLOW VELOCITY(FEET/SEC.) =   6.80
LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.50 =   12041.98 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  10326.50 TO NODE  10327.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   2438.80  DOWNSTREAM(FEET) =   2414.64
CHANNEL LENGTH THRU SUBAREA(FEET) =  1181.79   CHANNEL SLOPE =  0.0204
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.814
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -       82.27      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     252.46
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.38
AVERAGE FLOW DEPTH(FEET) =   3.95   TRAVEL TIME(MIN.) =   3.66
Tc(MIN.) =   41.78
SUBAREA AREA(ACRES) =    82.27       SUBAREA RUNOFF(CFS) =   23.24
EFFECTIVE AREA(ACRES) =    843.80     AREA-AVERAGED Fm(INCH/HR) =   0.50
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =      843.8         PEAK FLOW RATE(CFS) =     240.84
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  3.89   FLOW VELOCITY(FEET/SEC.) =   5.32
LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.00 =   13223.77 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  10327.00 TO NODE  10327.50 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   2414.64  DOWNSTREAM(FEET) =   2389.73
```



```
CHANNEL LENGTH THRU SUBAREA(FEET) =  2431.92   CHANNEL SLOPE =  0.0102
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.737
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -      243.69      0.50     0.997     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     267.03
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.21
AVERAGE FLOW DEPTH(FEET) =   4.60   TRAVEL TIME(MIN.) =   9.62
Tc(MIN.) =   51.40
SUBAREA AREA(ACRES) =   243.69       SUBAREA RUNOFF(CFS) =   52.30
EFFECTIVE AREA(ACRES) =   1087.49     AREA-AVERAGED Fm(INCH/HR) =   0.50
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =     1087.5         PEAK FLOW RATE(CFS) =     240.84
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  4.42   FLOW VELOCITY(FEET/SEC.) =   4.11
LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.50 =   15655.69 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   2389.73  DOWNSTREAM(FEET) =   2330.13
CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.59   CHANNEL SLOPE =  0.0306
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.708
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -       69.36      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     247.33
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.23
AVERAGE FLOW DEPTH(FEET) =   3.64   TRAVEL TIME(MIN.) =   5.20
Tc(MIN.) =   56.59
SUBAREA AREA(ACRES) =    69.36       SUBAREA RUNOFF(CFS) =   12.98
EFFECTIVE AREA(ACRES) =   1156.85     AREA-AVERAGED Fm(INCH/HR) =   0.50
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =     1156.8         PEAK FLOW RATE(CFS) =     240.84
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  3.60   FLOW VELOCITY(FEET/SEC.) =   6.20
LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10330.00 =   17600.28 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   56.59
  RAINFALL INTENSITY(INCH/HR) =   0.71
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1156.85
  TOTAL STREAM AREA(ACRES) =    1156.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     240.84

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      347.84   56.17    0.710  0.50( 0.50) 0.99    1509.2   10300.00
      2      240.84   56.59    0.708  0.50( 0.50) 1.00    1156.8   10320.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      588.68   56.17    0.710  0.50( 0.50) 1.00    2657.3   10300.00
      2      584.79   56.59    0.708  0.50( 0.50) 1.00    2666.1   10320.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     588.68    Tc(MIN.) =    56.17
  EFFECTIVE AREA(ACRES) =    2657.32   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2666.1
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10330.00 TO NODE  10331.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2330.13  DOWNSTREAM(FEET) =   2041.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3034.53   CHANNEL SLOPE =  0.0951
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.688
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       70.23      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     594.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.87
  AVERAGE FLOW DEPTH(FEET) =   4.09   TRAVEL TIME(MIN.) =   4.26
  Tc(MIN.) =   60.43
  SUBAREA AREA(ACRES) =    70.23       SUBAREA RUNOFF(CFS) =   11.84
```



```
  EFFECTIVE AREA(ACRES) =   2727.55     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2736.3         PEAK FLOW RATE(CFS) =     588.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.07   FLOW VELOCITY(FEET/SEC.) =  11.84
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10331.00 =   24386.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2041.66  DOWNSTREAM(FEET) =   1739.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3264.87   CHANNEL SLOPE =  0.0924
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.672
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      104.94      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     596.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.75
  AVERAGE FLOW DEPTH(FEET) =   4.12   TRAVEL TIME(MIN.) =   4.63
  Tc(MIN.) =   65.06
  SUBAREA AREA(ACRES) =   104.94       SUBAREA RUNOFF(CFS) =   16.27
  EFFECTIVE AREA(ACRES) =   2832.49     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2841.2         PEAK FLOW RATE(CFS) =     588.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.09   FLOW VELOCITY(FEET/SEC.) =  11.72
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S1.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)         (ACRES)    NODE
      1      156.09  113.12  0.50( 0.50) 1.00    2134.1   10100.00
    TOTAL AREA(ACRES) =     2134.1
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S2.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      467.40   53.42  0.50( 0.50) 1.00    1673.9   10200.00
      2      369.72   67.09  0.50( 0.50) 1.00    1841.1   10210.00
    TOTAL AREA(ACRES) =     1841.1

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      467.40   53.42  0.50( 0.50) 1.00    1673.9   10200.00
      2      369.72   67.09  0.50( 0.50) 1.00    1841.1   10210.00
    TOTAL AREA(ACRES) =      1841.1

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      467.40   53.42    0.726  0.50( 0.50) 1.00    1673.9   10200.00
      2      369.72   67.09    0.666  0.50( 0.50) 1.00    1841.1   10210.00
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      156.09  113.12    0.552  0.50( 0.50) 1.00    2134.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      623.49   53.42    0.726  0.50( 0.50) 1.00    2681.8   10200.00
      2      525.80   67.09    0.666  0.50( 0.50) 1.00    3106.9   10210.00
      3      272.76  113.12    0.552  0.50( 0.50) 1.00    3975.2   10100.00
    TOTAL AREA(ACRES) =      3975.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      623.49  Tc(MIN.) =   53.422
  EFFECTIVE AREA(ACRES) =   2681.83  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3975.2
```



```
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10222.00 TO NODE  10332.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1925.82  DOWNSTREAM(FEET) =   1739.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1475.92   CHANNEL SLOPE =  0.1259
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.716
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       19.92      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     625.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.37
  AVERAGE FLOW DEPTH(FEET) =   3.95   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   55.26
  SUBAREA AREA(ACRES) =    19.92       SUBAREA RUNOFF(CFS) =    3.86
  EFFECTIVE AREA(ACRES) =   2701.75     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3995.2         PEAK FLOW RATE(CFS) =     623.49
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.95   FLOW VELOCITY(FEET/SEC.) =  13.34
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      623.49   55.26    0.716  0.50( 0.50) 1.00    2701.7   10200.00
      2      525.80   69.01    0.660  0.50( 0.50) 1.00    3126.8   10210.00
      3      272.76  115.38    0.549  0.50( 0.50) 1.00    3995.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      588.68   65.06    0.672  0.50( 0.50) 1.00    2832.5   10300.00
      2      584.79   65.50    0.671  0.50( 0.50) 1.00    2841.2   10320.00
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1212.17   55.26    0.716  0.50( 0.50) 1.00    5107.7   10200.00
```

```
      2     1142.56   65.06    0.672  0.50( 0.50) 1.00    5837.1   10300.00
      3     1135.57   65.50    0.671  0.50( 0.50) 1.00    5859.4   10320.00
      4     1071.75   69.01    0.660  0.50( 0.50) 1.00    5968.0   10210.00
      5      443.75  115.38    0.549  0.50( 0.50) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =      6836.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1212.17  Tc(MIN.) =   55.262
  EFFECTIVE AREA(ACRES) =   5107.70  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     6836.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     6836.4  TC(MIN.) =     55.26
  EFFECTIVE AREA(ACRES) =   5107.70  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.998
  PEAK FLOW RATE(CFS)   =    1212.17

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1212.17   55.26    0.716  0.50( 0.50) 1.00    5107.7   10200.00
      2     1142.56   65.06    0.672  0.50( 0.50) 1.00    5837.1   10300.00
      3     1135.57   65.50    0.671  0.50( 0.50) 1.00    5859.4   10320.00
      4     1071.75   69.01    0.660  0.50( 0.50) 1.00    5968.0   10210.00
      5      443.75  115.38    0.549  0.50( 0.50) 1.00    6836.4   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S4.DAT
  TIME/DATE OF STUDY: 10:29 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.289
   2)   10.00;  2.117
   3)   15.00;  1.447
   4)   20.00;  1.246
   5)   25.00;  1.074
   6)   30.00;  0.944
   7)   40.00;  0.825
   8)   50.00;  0.741
   9)   60.00;  0.684
  10)   90.00;  0.586
  11)  120.00;  0.536
  12)  180.00;  0.459
  13)  360.00;  0.357
  14) 1440.00;  0.162
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10400.00 TO NODE  10401.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.42
  ELEVATION DATA: UPSTREAM(FEET) =   2648.70  DOWNSTREAM(FEET) =   2536.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.799
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.375
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.89      0.50     1.000     0   16.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.64
  TOTAL AREA(ACRES) =      5.89   PEAK FLOW RATE(CFS) =      4.64

**************************************************************************
  FLOW PROCESS FROM NODE  10401.00 TO NODE  10402.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2536.15  DOWNSTREAM(FEET) =   2504.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   934.06   CHANNEL SLOPE =  0.0340
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.172
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.57      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.90
  AVERAGE FLOW DEPTH(FEET) =   1.07   TRAVEL TIME(MIN.) =   5.36
  Tc(MIN.) =   22.16
  SUBAREA AREA(ACRES) =    17.57       SUBAREA RUNOFF(CFS) =   10.62
  EFFECTIVE AREA(ACRES) =     23.46     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.5         PEAK FLOW RATE(CFS) =      14.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   3.19
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.00 =    1884.48 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10402.00 TO NODE  10402.50 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2504.36  DOWNSTREAM(FEET) =   2462.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.55   CHANNEL SLOPE =  0.0439
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.049
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.74      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.15
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   25.98
  SUBAREA AREA(ACRES) =    56.74       SUBAREA RUNOFF(CFS) =   28.00
  EFFECTIVE AREA(ACRES) =     80.20     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       80.2         PEAK FLOW RATE(CFS) =      39.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =   4.50
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.50 =    2836.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10402.50 TO NODE  10403.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.54  DOWNSTREAM(FEET) =   2433.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.41   CHANNEL SLOPE =  0.0299
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.949
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.01      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.21
  AVERAGE FLOW DEPTH(FEET) =   2.06   TRAVEL TIME(MIN.) =   3.83
  Tc(MIN.) =   29.81
  SUBAREA AREA(ACRES) =    68.01       SUBAREA RUNOFF(CFS) =   27.47
  EFFECTIVE AREA(ACRES) =    148.21     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      148.2         PEAK FLOW RATE(CFS) =      59.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.15   FLOW VELOCITY(FEET/SEC.) =   4.33
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10403.00 =    3803.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10403.00 TO NODE  10404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2433.59  DOWNSTREAM(FEET) =   2239.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2934.12   CHANNEL SLOPE =  0.0662
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.860
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      301.25      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     108.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.78
  AVERAGE FLOW DEPTH(FEET) =   2.31   TRAVEL TIME(MIN.) =   7.21
  Tc(MIN.) =   37.02
  SUBAREA AREA(ACRES) =   301.25       SUBAREA RUNOFF(CFS) =   97.67
  EFFECTIVE AREA(ACRES) =    449.46     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      449.5         PEAK FLOW RATE(CFS) =     145.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.58   FLOW VELOCITY(FEET/SEC.) =   7.29
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10404.00 =    6737.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10404.00 TO NODE  10405.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2239.33  DOWNSTREAM(FEET) =   2128.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.32   CHANNEL SLOPE =  0.0386
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.785
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      152.68      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     165.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.15
  AVERAGE FLOW DEPTH(FEET) =   2.99   TRAVEL TIME(MIN.) =   7.76
  Tc(MIN.) =   44.78
  SUBAREA AREA(ACRES) =   152.68       SUBAREA RUNOFF(CFS) =   39.12
  EFFECTIVE AREA(ACRES) =    602.14     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      602.1         PEAK FLOW RATE(CFS) =     154.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.92   FLOW VELOCITY(FEET/SEC.) =   6.04
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10405.00 =    9599.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =  51
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2128.80  DOWNSTREAM(FEET) =   1759.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.12   CHANNEL SLOPE =  0.1878
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.760
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      139.70      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     170.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.20
  AVERAGE FLOW DEPTH(FEET) =   2.25   TRAVEL TIME(MIN.) =   2.93
  Tc(MIN.) =   47.70
  SUBAREA AREA(ACRES) =   139.70       SUBAREA RUNOFF(CFS) =   32.70
  EFFECTIVE AREA(ACRES) =    741.84     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      741.8         PEAK FLOW RATE(CFS) =     173.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.27   FLOW VELOCITY(FEET/SEC.) =  11.24
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10420.00 =   11566.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   47.70
  RAINFALL INTENSITY(INCH/HR) =   0.76
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     741.84
  TOTAL STREAM AREA(ACRES) =     741.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     173.65

****************************************************************************
  FLOW PROCESS FROM NODE  10410.00 TO NODE  10411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   413.10
  ELEVATION DATA: UPSTREAM(FEET) =   3217.26  DOWNSTREAM(FEET) =   3058.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.517
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.230
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        3.06      0.50     1.000     0    9.52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.76
  TOTAL AREA(ACRES) =      3.06   PEAK FLOW RATE(CFS) =      4.76

****************************************************************************
  FLOW PROCESS FROM NODE  10411.00 TO NODE  10412.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3058.86  DOWNSTREAM(FEET) =   2879.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.18   CHANNEL SLOPE =  0.3495
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.008
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.24      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.57
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   1.30
  Tc(MIN.) =   10.82
  SUBAREA AREA(ACRES) =     4.24       SUBAREA RUNOFF(CFS) =    5.75
  EFFECTIVE AREA(ACRES) =      7.30     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.3         PEAK FLOW RATE(CFS) =       9.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   6.94
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10412.00 =     925.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10412.00 TO NODE  10413.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.84  DOWNSTREAM(FEET) =   2644.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.24   CHANNEL SLOPE =  0.1208
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.403
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.95      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.14
  AVERAGE FLOW DEPTH(FEET) =   1.27   TRAVEL TIME(MIN.) =   5.28
```

```
  Tc(MIN.) =   16.09
  SUBAREA AREA(ACRES) =    47.95       SUBAREA RUNOFF(CFS) =   38.96
  EFFECTIVE AREA(ACRES) =     55.25     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.2         PEAK FLOW RATE(CFS) =      44.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   6.80
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10413.00 =    2869.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10413.00 TO NODE  10414.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2644.97  DOWNSTREAM(FEET) =   2550.42
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.61   CHANNEL SLOPE =  0.0468
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.177
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.60      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      91.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.70
  AVERAGE FLOW DEPTH(FEET) =   2.31   TRAVEL TIME(MIN.) =   5.90
  Tc(MIN.) =   22.00
  SUBAREA AREA(ACRES) =   151.60       SUBAREA RUNOFF(CFS) =   92.38
  EFFECTIVE AREA(ACRES) =    206.85     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.9         PEAK FLOW RATE(CFS) =     126.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.61   FLOW VELOCITY(FEET/SEC.) =   6.18
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10414.00 =    4889.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10414.00 TO NODE  10415.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2550.42  DOWNSTREAM(FEET) =   2391.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.76   CHANNEL SLOPE =  0.0830
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.052
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      206.03      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     177.39
```



```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.32
  AVERAGE FLOW DEPTH(FEET) =   2.67   TRAVEL TIME(MIN.) =   3.84
  Tc(MIN.) =   25.84
  SUBAREA AREA(ACRES) =   206.03       SUBAREA RUNOFF(CFS) =  102.36
  EFFECTIVE AREA(ACRES) =    412.88     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      412.9         PEAK FLOW RATE(CFS) =     205.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.81   FLOW VELOCITY(FEET/SEC.) =   8.65
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10415.00 =    6805.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10415.00 TO NODE  10416.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2391.31  DOWNSTREAM(FEET) =   2092.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2843.10   CHANNEL SLOPE =  0.1052
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.936
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      122.38      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     229.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.72
  AVERAGE FLOW DEPTH(FEET) =   2.80   TRAVEL TIME(MIN.) =   4.87
  Tc(MIN.) =   30.71
  SUBAREA AREA(ACRES) =   122.38       SUBAREA RUNOFF(CFS) =   47.95
  EFFECTIVE AREA(ACRES) =    535.26     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      535.3         PEAK FLOW RATE(CFS) =     209.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.71   FLOW VELOCITY(FEET/SEC.) =   9.51
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10416.00 =    9648.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2092.16  DOWNSTREAM(FEET) =   1759.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2151.95   CHANNEL SLOPE =  0.1546
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.897
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.94      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     220.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.14
  AVERAGE FLOW DEPTH(FEET) =   2.57   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =   33.93
  SUBAREA AREA(ACRES) =    59.94       SUBAREA RUNOFF(CFS) =   21.42
  EFFECTIVE AREA(ACRES) =    595.20     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      595.2         PEAK FLOW RATE(CFS) =     212.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.54   FLOW VELOCITY(FEET/SEC.) =  11.01
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.93
  RAINFALL INTENSITY(INCH/HR) =   0.90
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     595.20
  TOTAL STREAM AREA(ACRES) =     595.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     212.68

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      173.65   47.70    0.760  0.50( 0.50) 1.00     741.8   10400.00
      2      212.68   33.93    0.897  0.50( 0.50) 1.00     595.2   10410.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      386.33   33.93    0.897  0.50( 0.50) 1.00    1122.8   10410.00
      2      312.97   47.70    0.760  0.50( 0.50) 1.00    1337.0   10400.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     386.33    Tc(MIN.) =    33.93
  EFFECTIVE AREA(ACRES) =    1122.84   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1337.0
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1759.52  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2477.21   CHANNEL SLOPE =  0.0287
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.825
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.64      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     396.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.84
  AVERAGE FLOW DEPTH(FEET) =   4.40   TRAVEL TIME(MIN.) =   6.03
  Tc(MIN.) =   39.96
  SUBAREA AREA(ACRES) =    72.64       SUBAREA RUNOFF(CFS) =   21.26
  EFFECTIVE AREA(ACRES) =   1195.48     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1409.7         PEAK FLOW RATE(CFS) =     386.33
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.35   FLOW VELOCITY(FEET/SEC.) =   6.80
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S3.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1212.17   55.26  0.50( 0.50) 1.00    5107.7   10200.00
      2     1142.56   65.06  0.50( 0.50) 1.00    5837.1   10300.00
      3     1135.57   65.50  0.50( 0.50) 1.00    5859.4   10320.00
      4     1071.75   69.01  0.50( 0.50) 1.00    5968.0   10210.00
      5      443.75  115.38  0.50( 0.50) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =     6836.4

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1212.17   55.26  0.50( 0.50) 1.00    5107.7   10200.00
```

```
      2     1142.56   65.06  0.50( 0.50) 1.00    5837.1   10300.00
      3     1135.57   65.50  0.50( 0.50) 1.00    5859.4   10320.00
      4     1071.75   69.01  0.50( 0.50) 1.00    5968.0   10210.00
      5      443.75  115.38  0.50( 0.50) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =      6836.4

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10507.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1739.96  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2238.93   CHANNEL SLOPE =  0.0231
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.686
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1217.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.35
  AVERAGE FLOW DEPTH(FEET) =   6.97   TRAVEL TIME(MIN.) =   4.47
  Tc(MIN.) =   59.73
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =   10.33
  EFFECTIVE AREA(ACRES) =   5169.63     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6898.3         PEAK FLOW RATE(CFS) =    1212.17
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.96   FLOW VELOCITY(FEET/SEC.) =   8.34
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1212.17   59.73    0.686  0.50( 0.50) 1.00    5169.6   10200.00
      2     1142.56   69.60    0.653  0.50( 0.50) 1.00    5899.1   10300.00
      3     1135.57   70.04    0.651  0.50( 0.50) 1.00    5921.3   10320.00
      4     1071.75   73.62    0.640  0.50( 0.50) 1.00    6030.0   10210.00
      5      443.75  121.13    0.535  0.50( 0.50) 1.00    6898.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      386.33   39.96    0.825  0.50( 0.50) 1.00    1195.5   10410.00
      2      312.97   54.06    0.718  0.50( 0.50) 1.00    1409.7   10400.00
```



```
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1598.49   39.96    0.825  0.50( 0.50) 1.00    4654.3   10410.00
      2     1525.14   54.06    0.718  0.50( 0.50) 1.00    6088.9   10400.00
      3     1478.69   59.73    0.686  0.50( 0.50) 1.00    6579.3   10200.00
      4     1361.79   69.60    0.653  0.50( 0.50) 1.00    7308.7   10300.00
      5     1352.71   70.04    0.651  0.50( 0.50) 1.00    7331.0   10320.00
      6     1272.08   73.62    0.640  0.50( 0.50) 1.00    7439.6   10210.00
      7      493.14  121.13    0.535  0.50( 0.50) 1.00    8308.0   10100.00
    TOTAL AREA(ACRES) =      8308.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1598.49  Tc(MIN.) =   39.964
  EFFECTIVE AREA(ACRES) =   4654.31  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     8308.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     8308.0  TC(MIN.) =     39.96
  EFFECTIVE AREA(ACRES) =   4654.31  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    1598.49

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1598.49   39.96    0.825  0.50( 0.50) 1.00    4654.3   10410.00
      2     1525.14   54.06    0.718  0.50( 0.50) 1.00    6088.9   10400.00
      3     1478.69   59.73    0.686  0.50( 0.50) 1.00    6579.3   10200.00
      4     1361.79   69.60    0.653  0.50( 0.50) 1.00    7308.7   10300.00
      5     1352.71   70.04    0.651  0.50( 0.50) 1.00    7331.0   10320.00
      6     1272.08   73.62    0.640  0.50( 0.50) 1.00    7439.6   10210.00
      7      493.14  121.13    0.535  0.50( 0.50) 1.00    8308.0   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S5.DAT
  TIME/DATE OF STUDY: 10:29 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.289
   2)   10.00;  2.117
   3)   15.00;  1.447
   4)   20.00;  1.246
   5)   25.00;  1.074
   6)   30.00;  0.944
   7)   40.00;  0.825
   8)   50.00;  0.741
   9)   60.00;  0.684
  10)   90.00;  0.586
  11)  120.00;  0.536
  12)  180.00;  0.459
  13)  360.00;  0.357
  14) 1440.00;  0.162
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10500.00 TO NODE  10501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.64
  ELEVATION DATA: UPSTREAM(FEET) =   3108.31  DOWNSTREAM(FEET) =   3060.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.565
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.922
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          -        1.54      0.50      0.910      0    6.57
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
  SUBAREA RUNOFF(CFS) =      3.42
  TOTAL AREA(ACRES) =      1.54   PEAK FLOW RATE(CFS) =      3.42

**************************************************************************
  FLOW PROCESS FROM NODE  10501.00 TO NODE  10502.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3060.24  DOWNSTREAM(FEET) =   2942.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.48   CHANNEL SLOPE =  0.1703
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.424
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.27      0.50      0.943     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.943
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.41
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =    8.69
  SUBAREA AREA(ACRES) =     8.27       SUBAREA RUNOFF(CFS) =   14.53
  EFFECTIVE AREA(ACRES) =      9.81     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =        9.8         PEAK FLOW RATE(CFS) =      17.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   6.09
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10502.00 =     986.12 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10502.00 TO NODE  10503.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2942.64  DOWNSTREAM(FEET) =   2815.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   957.31   CHANNEL SLOPE =  0.1331
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.956
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.91      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.36
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   11.20
  SUBAREA AREA(ACRES) =    18.91       SUBAREA RUNOFF(CFS) =   24.78
  EFFECTIVE AREA(ACRES) =     28.72     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       28.7         PEAK FLOW RATE(CFS) =      37.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.37   FLOW VELOCITY(FEET/SEC.) =   6.75
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10503.00 =    1943.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10503.00 TO NODE  10504.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2815.24  DOWNSTREAM(FEET) =   2202.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2096.20   CHANNEL SLOPE =  0.2923
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.520
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.49      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      73.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.73
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   3.25
  Tc(MIN.) =   14.45
  SUBAREA AREA(ACRES) =    75.49       SUBAREA RUNOFF(CFS) =   69.31
  EFFECTIVE AREA(ACRES) =    104.21     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =      95.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.67   FLOW VELOCITY(FEET/SEC.) =  11.50
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10504.00 =    4039.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10504.00 TO NODE  10505.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2202.44  DOWNSTREAM(FEET) =   1969.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.32   CHANNEL SLOPE =  0.0834
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.248
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      278.21      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     190.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.50
  AVERAGE FLOW DEPTH(FEET) =   2.73   TRAVEL TIME(MIN.) =   5.49
  Tc(MIN.) =   19.94
  SUBAREA AREA(ACRES) =   278.21       SUBAREA RUNOFF(CFS) =  187.34
  EFFECTIVE AREA(ACRES) =    382.42     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      382.4         PEAK FLOW RATE(CFS) =     257.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.06   FLOW VELOCITY(FEET/SEC.) =   9.16
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10505.00 =    6839.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10505.00 TO NODE  10506.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1969.00  DOWNSTREAM(FEET) =   1759.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.99   CHANNEL SLOPE =  0.0725
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.071
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      323.47      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     341.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.33
  AVERAGE FLOW DEPTH(FEET) =   3.49   TRAVEL TIME(MIN.) =   5.17
  Tc(MIN.) =   25.11
  SUBAREA AREA(ACRES) =   323.47       SUBAREA RUNOFF(CFS) =  166.23
  EFFECTIVE AREA(ACRES) =    705.89     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      705.9         PEAK FLOW RATE(CFS) =     363.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.57   FLOW VELOCITY(FEET/SEC.) =   9.48
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10506.00 =    9732.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1759.23  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2597.28   CHANNEL SLOPE =  0.0273
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.926
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.34      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     403.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.75
  AVERAGE FLOW DEPTH(FEET) =   4.47   TRAVEL TIME(MIN.) =   6.42
  Tc(MIN.) =   31.52
  SUBAREA AREA(ACRES) =   212.34       SUBAREA RUNOFF(CFS) =   81.35
  EFFECTIVE AREA(ACRES) =    918.23     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      918.2         PEAK FLOW RATE(CFS) =     363.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.29   FLOW VELOCITY(FEET/SEC.) =   6.57
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      918.2  TC(MIN.) =     31.52
  EFFECTIVE AREA(ACRES) =    918.23  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =     363.02
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S6.DAT
  TIME/DATE OF STUDY: 10:29 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.244
   2)   10.00;  2.093
   3)   15.00;  1.437
   4)   20.00;  1.237
   5)   25.00;  1.067
   6)   30.00;  0.940
   7)   40.00;  0.819
   8)   50.00;  0.735
   9)   60.00;  0.679
  10)   90.00;  0.580
  11)  120.00;  0.529
  12)  180.00;  0.453
  13)  360.00;  0.351
  14) 1440.00;  0.159
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10600.00 TO NODE  10601.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   312.13
  ELEVATION DATA: UPSTREAM(FEET) =   3250.51  DOWNSTREAM(FEET) =   3126.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.451
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.450
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.47      0.50     1.000     0    8.45
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.33
  TOTAL AREA(ACRES) =      2.47   PEAK FLOW RATE(CFS) =      4.33

**************************************************************************
  FLOW PROCESS FROM NODE  10601.00 TO NODE  10602.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3126.78  DOWNSTREAM(FEET) =   2951.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.40   CHANNEL SLOPE =  0.2828
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.081
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.58      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.30
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   1.64
  Tc(MIN.) =   10.09
  SUBAREA AREA(ACRES) =     6.58       SUBAREA RUNOFF(CFS) =    9.36
  EFFECTIVE AREA(ACRES) =      9.05     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =      12.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.79   FLOW VELOCITY(FEET/SEC.) =   6.87
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10602.00 =     932.53 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10602.00 TO NODE  10603.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2951.30  DOWNSTREAM(FEET) =   2641.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1930.18   CHANNEL SLOPE =  0.1606
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.512
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.78      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
  AVERAGE FLOW DEPTH(FEET) =   1.37   TRAVEL TIME(MIN.) =   4.34
  Tc(MIN.) =   14.43
  SUBAREA AREA(ACRES) =    60.78       SUBAREA RUNOFF(CFS) =   55.33
  EFFECTIVE AREA(ACRES) =     69.83     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.8         PEAK FLOW RATE(CFS) =      63.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.60   FLOW VELOCITY(FEET/SEC.) =   8.28
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10603.00 =    2862.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10603.00 TO NODE  10604.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2641.28  DOWNSTREAM(FEET) =   2318.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.90   CHANNEL SLOPE =  0.1640
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.315
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.78      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      88.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.03
  AVERAGE FLOW DEPTH(FEET) =   1.81   TRAVEL TIME(MIN.) =   3.63
  Tc(MIN.) =   18.06
  SUBAREA AREA(ACRES) =    68.78       SUBAREA RUNOFF(CFS) =   50.41
  EFFECTIVE AREA(ACRES) =    138.61     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      138.6         PEAK FLOW RATE(CFS) =     101.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.90   FLOW VELOCITY(FEET/SEC.) =   9.36
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10604.00 =    4829.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10604.00 TO NODE  10605.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2318.61  DOWNSTREAM(FEET) =   1983.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2601.81   CHANNEL SLOPE =  0.1286
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.148
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      178.16      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     153.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.49
  AVERAGE FLOW DEPTH(FEET) =   2.32   TRAVEL TIME(MIN.) =   4.57
  Tc(MIN.) =   22.63
  SUBAREA AREA(ACRES) =   178.16       SUBAREA RUNOFF(CFS) =  103.80
  EFFECTIVE AREA(ACRES) =    316.77     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      316.8         PEAK FLOW RATE(CFS) =     184.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.49   FLOW VELOCITY(FEET/SEC.) =   9.92
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10605.00 =    7431.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1983.94  DOWNSTREAM(FEET) =   1655.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2439.06   CHANNEL SLOPE =  0.1348
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.027
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.31      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     199.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.31
  AVERAGE FLOW DEPTH(FEET) =   2.54   TRAVEL TIME(MIN.) =   3.94
  Tc(MIN.) =   26.57
  SUBAREA AREA(ACRES) =    61.31       SUBAREA RUNOFF(CFS) =   29.07
  EFFECTIVE AREA(ACRES) =    378.08     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      378.1         PEAK FLOW RATE(CFS) =     184.56
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.47   FLOW VELOCITY(FEET/SEC.) =  10.11
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S4.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1598.49   39.96  0.50( 0.50) 1.00    4654.3   10410.00
     2     1525.14   54.06  0.50( 0.50) 1.00    6088.9   10400.00
     3     1478.69   59.73  0.50( 0.50) 1.00    6579.3   10200.00
     4     1361.79   69.60  0.50( 0.50) 1.00    7308.7   10300.00
     5     1352.71   70.04  0.50( 0.50) 1.00    7331.0   10320.00
     6     1272.08   73.62  0.50( 0.50) 1.00    7439.6   10210.00
     7      493.14  121.13  0.50( 0.50) 1.00    8308.0   10100.00
   TOTAL AREA(ACRES) =     8308.0

****************************************************************************
 FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S5.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      363.02   31.52  0.50( 0.50) 1.00     918.2   10500.00
   TOTAL AREA(ACRES) =      918.2

****************************************************************************
 FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      363.02   31.52  0.50( 0.50) 1.00     918.2   10500.00
   TOTAL AREA(ACRES) =       918.2

****************************************************************************
 FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      363.02   31.52    0.922  0.50( 0.50) 1.00     918.2   10500.00
 LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.
```



```
 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1598.49   39.96    0.819  0.50( 0.50) 1.00    4654.3   10410.00
     2     1525.14   54.06    0.712  0.50( 0.50) 1.00    6088.9   10400.00
     3     1478.69   59.73    0.681  0.50( 0.50) 1.00    6579.3   10200.00
     4     1361.79   69.60    0.647  0.50( 0.50) 1.00    7308.7   10300.00
     5     1352.71   70.04    0.646  0.50( 0.50) 1.00    7331.0   10320.00
     6     1272.08   73.62    0.634  0.50( 0.50) 1.00    7439.6   10210.00
     7      493.14  121.13    0.528  0.50( 0.50) 1.00    8308.0   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1961.52   31.52    0.922  0.50( 0.50) 1.00    4589.6   10500.00
     2     1873.60   39.96    0.819  0.50( 0.50) 1.00    5572.5   10410.00
     3     1707.96   54.06    0.712  0.50( 0.50) 1.00    7007.1   10400.00
     4     1634.19   59.73    0.681  0.50( 0.50) 1.00    7497.5   10200.00
     5     1488.73   69.60    0.647  0.50( 0.50) 1.00    8227.0   10300.00
     6     1478.39   70.04    0.646  0.50( 0.50) 1.00    8249.2   10320.00
     7     1387.58   73.62    0.634  0.50( 0.50) 1.00    8357.9   10210.00
     8      516.98  121.13    0.528  0.50( 0.50) 1.00    9226.2   10100.00
   TOTAL AREA(ACRES) =      9226.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1961.52  Tc(MIN.) =   31.523
 EFFECTIVE AREA(ACRES) =   4589.56  AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     9226.2
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10507.00 TO NODE  10620.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1688.35  DOWNSTREAM(FEET) =   1655.24
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2570.61   CHANNEL SLOPE =  0.0129
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.853
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       83.74      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1974.82
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.58
 AVERAGE FLOW DEPTH(FEET) =   9.32   TRAVEL TIME(MIN.) =   5.65
 Tc(MIN.) =   37.18
 SUBAREA AREA(ACRES) =    83.74       SUBAREA RUNOFF(CFS) =   26.60
 EFFECTIVE AREA(ACRES) =   4673.30     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     9310.0         PEAK FLOW RATE(CFS) =    1961.52
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 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.30   FLOW VELOCITY(FEET/SEC.) =   7.56
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1961.52   37.18    0.853  0.50( 0.50) 1.00    4673.3   10500.00
     2     1873.60   45.69    0.771  0.50( 0.50) 1.00    5656.3   10410.00
     3     1707.96   59.92    0.679  0.50( 0.50) 1.00    7090.8   10400.00
     4     1634.19   65.65    0.660  0.50( 0.50) 1.00    7581.3   10200.00
     5     1488.73   75.66    0.627  0.50( 0.50) 1.00    8310.7   10300.00
     6     1478.39   76.12    0.626  0.50( 0.50) 1.00    8332.9   10320.00
     7     1387.58   79.79    0.614  0.50( 0.50) 1.00    8441.6   10210.00
     8      516.98  129.04    0.518  0.50( 0.50) 1.00    9310.0   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      184.56   26.57    1.027  0.50( 0.50) 1.00     378.1   10600.00
 LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2146.08   26.57    1.027  0.50( 0.50) 1.00    3718.6   10600.00
     2     2085.17   37.18    0.853  0.50( 0.50) 1.00    5051.4   10500.00
     3     1968.55   45.69    0.771  0.50( 0.50) 1.00    6034.4   10410.00
     4     1770.75   59.92    0.679  0.50( 0.50) 1.00    7468.9   10400.00
     5     1690.30   65.65    0.660  0.50( 0.50) 1.00    7959.4   10200.00
     6     1533.26   75.66    0.627  0.50( 0.50) 1.00    8688.8   10300.00
     7     1522.39   76.12    0.626  0.50( 0.50) 1.00    8711.0   10320.00
     8     1427.34   79.79    0.614  0.50( 0.50) 1.00    8819.7   10210.00
     9      523.06  129.04    0.518  0.50( 0.50) 1.00    9688.1   10100.00
   TOTAL AREA(ACRES) =      9688.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     2146.08  Tc(MIN.) =   26.575
 EFFECTIVE AREA(ACRES) =   3718.60  AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     9688.1
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10620.00 TO NODE  10621.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```



```
 ELEVATION DATA: UPSTREAM(FEET) =   1655.24  DOWNSTREAM(FEET) =   1584.84
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2294.47   CHANNEL SLOPE =  0.0307
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.939
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -      342.43      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2213.65
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.80
 AVERAGE FLOW DEPTH(FEET) =   8.27   TRAVEL TIME(MIN.) =   3.54
 Tc(MIN.) =   30.12
 SUBAREA AREA(ACRES) =   342.43       SUBAREA RUNOFF(CFS) =  135.10
 EFFECTIVE AREA(ACRES) =   4061.03     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    10030.5          PEAK FLOW RATE(CFS) =    2146.08
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.17   FLOW VELOCITY(FEET/SEC.) =  10.71
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10621.00 =   40157.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1584.84  DOWNSTREAM(FEET) =   1443.87
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2923.79   CHANNEL SLOPE =  0.0482
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.892
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -      160.90      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2174.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.72
 AVERAGE FLOW DEPTH(FEET) =   7.55   TRAVEL TIME(MIN.) =   3.83
 Tc(MIN.) =   33.95
 SUBAREA AREA(ACRES) =   160.90       SUBAREA RUNOFF(CFS) =   56.77
 EFFECTIVE AREA(ACRES) =   4221.93     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    10191.4          PEAK FLOW RATE(CFS) =    2146.08
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.51   FLOW VELOCITY(FEET/SEC.) =  12.68
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =   1
```

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--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.95
  RAINFALL INTENSITY(INCH/HR) =   0.89
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    4221.93
  TOTAL STREAM AREA(ACRES) =   10191.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2146.08

****************************************************************************
  FLOW PROCESS FROM NODE  10630.00 TO NODE  10631.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.79
  ELEVATION DATA: UPSTREAM(FEET) =   3257.00  DOWNSTREAM(FEET) =   3147.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.430
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.454
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.25      0.50     1.000     0    8.43
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.20
  TOTAL AREA(ACRES) =      1.25   PEAK FLOW RATE(CFS) =      2.20

****************************************************************************
  FLOW PROCESS FROM NODE  10631.00 TO NODE  10632.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3147.13  DOWNSTREAM(FEET) =   2774.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   640.96   CHANNEL SLOPE =  0.5817
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.119
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.75      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.32
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   1.46
  Tc(MIN.) =    9.89
  SUBAREA AREA(ACRES) =     4.75       SUBAREA RUNOFF(CFS) =    6.92
```



```
  EFFECTIVE AREA(ACRES) =      6.00     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =       8.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   8.15
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10632.00 =     939.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10632.00 TO NODE  10633.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2774.29  DOWNSTREAM(FEET) =   2004.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.65   CHANNEL SLOPE =  0.4039
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.737
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.75      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.23
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =   2.83
  Tc(MIN.) =   12.72
  SUBAREA AREA(ACRES) =    79.75       SUBAREA RUNOFF(CFS) =   88.75
  EFFECTIVE AREA(ACRES) =     85.75     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       85.8         PEAK FLOW RATE(CFS) =      95.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.57   FLOW VELOCITY(FEET/SEC.) =  12.92
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10633.00 =    2845.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10633.00 TO NODE  10634.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.58  DOWNSTREAM(FEET) =   1714.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1868.05   CHANNEL SLOPE =  0.1550
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.405
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.45      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     146.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.06
  AVERAGE FLOW DEPTH(FEET) =   2.20   TRAVEL TIME(MIN.) =   3.10
```

```
  Tc(MIN.) =   15.81
  SUBAREA AREA(ACRES) =   124.45       SUBAREA RUNOFF(CFS) =  101.29
  EFFECTIVE AREA(ACRES) =    210.20     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      210.2         PEAK FLOW RATE(CFS) =     171.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.34   FLOW VELOCITY(FEET/SEC.) =  10.44
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10634.00 =    4713.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1714.99  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.34   CHANNEL SLOPE =  0.1609
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.301
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       42.00      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     186.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.84
  AVERAGE FLOW DEPTH(FEET) =   2.39   TRAVEL TIME(MIN.) =   2.59
  Tc(MIN.) =   18.40
  SUBAREA AREA(ACRES) =    42.00       SUBAREA RUNOFF(CFS) =   30.27
  EFFECTIVE AREA(ACRES) =    252.20     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.2         PEAK FLOW RATE(CFS) =     181.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.38   FLOW VELOCITY(FEET/SEC.) =  10.73
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10640.00 =    6398.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.40
  RAINFALL INTENSITY(INCH/HR) =   1.30
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     252.20
  TOTAL STREAM AREA(ACRES) =     252.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     181.73

  ** CONFLUENCE DATA **
```



```
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     2146.08   33.95    0.892  0.50( 0.50) 1.00    4221.9   10600.00
    1     2085.17   44.61    0.780  0.50( 0.50) 1.00    5554.7   10500.00
    1     1968.55   53.24    0.717  0.50( 0.50) 1.00    6537.7   10410.00
    1     1770.75   67.68    0.654  0.50( 0.50) 1.00    7972.3   10400.00
    1     1690.30   73.50    0.634  0.50( 0.50) 1.00    8462.7   10200.00
    1     1533.26   83.71    0.601  0.50( 0.50) 1.00    9192.1   10300.00
    1     1522.39   84.17    0.599  0.50( 0.50) 1.00    9214.3   10320.00
    1     1427.34   87.99    0.587  0.50( 0.50) 1.00    9323.0   10210.00
    1      523.06  139.58    0.504  0.50( 0.50) 1.00   10191.4   10100.00
    2      181.73   18.40    1.301  0.50( 0.50) 1.00     252.2   10630.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     2327.81   18.40    1.301  0.50( 0.50) 1.00    2541.0   10630.00
    2     2235.06   33.95    0.892  0.50( 0.50) 1.00    4474.1   10600.00
    3     2148.74   44.61    0.780  0.50( 0.50) 1.00    5806.9   10500.00
    4     2017.73   53.24    0.717  0.50( 0.50) 1.00    6789.9   10410.00
    5     1805.59   67.68    0.654  0.50( 0.50) 1.00    8224.5   10400.00
    6     1720.76   73.50    0.634  0.50( 0.50) 1.00    8714.9   10200.00
    7     1556.08   83.71    0.601  0.50( 0.50) 1.00    9444.3   10300.00
    8     1544.87   84.17    0.599  0.50( 0.50) 1.00    9466.5   10320.00
    9     1446.95   87.99    0.587  0.50( 0.50) 1.00    9575.2   10210.00
   10      523.97  139.58    0.504  0.50( 0.50) 1.00   10443.6   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2327.81    Tc(MIN.) =    18.40
  EFFECTIVE AREA(ACRES) =    2540.97   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    10443.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1443.87  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2254.45   CHANNEL SLOPE =  0.0548
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.198
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.37      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2357.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.63
  AVERAGE FLOW DEPTH(FEET) =   7.59   TRAVEL TIME(MIN.) =   2.76
  Tc(MIN.) =   21.16
```

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  SUBAREA AREA(ACRES) =    94.37       SUBAREA RUNOFF(CFS) =   59.23
  EFFECTIVE AREA(ACRES) =   2635.34     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10538.0         PEAK FLOW RATE(CFS) =    2327.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.56   FLOW VELOCITY(FEET/SEC.) =  13.58
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    10538.0  TC(MIN.) =     21.16
  EFFECTIVE AREA(ACRES) =   2635.34  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    2327.81

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2327.81   21.16    1.198  0.50( 0.50) 1.00    2635.3   10630.00
      2     2235.06   36.74    0.858  0.50( 0.50) 1.00    4568.5   10600.00
      3     2148.74   47.43    0.757  0.50( 0.50) 1.00    5901.3   10500.00
      4     2017.73   56.10    0.701  0.50( 0.50) 1.00    6884.3   10410.00
      5     1805.59   70.62    0.644  0.50( 0.50) 1.00    8318.8   10400.00
      6     1720.76   76.48    0.625  0.50( 0.50) 1.00    8809.3   10200.00
      7     1556.08   86.77    0.591  0.50( 0.50) 1.00    9538.7   10300.00
      8     1544.87   87.24    0.589  0.50( 0.50) 1.00    9560.9   10320.00
      9     1446.95   91.11    0.578  0.50( 0.50) 1.00    9669.6   10210.00
     10      523.97  143.59    0.499  0.50( 0.50) 1.00   10538.0   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:
```

FILE NAME: S7.DAT
TIME/DATE OF STUDY: 10:29 04/01/2013

==========

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

==========

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
USER-DEFINED TABLED RAINFALL USED
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	3.244
2)	10.00;	2.093
3)	15.00;	1.437
4)	20.00;	1.237
5)	25.00;	1.067
6)	30.00;	0.940
7)	40.00;	0.819
8)	50.00;	0.735
9)	60.00;	0.679
10)	90.00;	0.580
11)	120.00;	0.529
12)	180.00;	0.453
13)	360.00;	0.351
14)	1440.00;	0.159

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****

FLOW PROCESS FROM NODE 10700.00 TO NODE 10701.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

==========

INITIAL SUBAREA FLOW-LENGTH(FEET) = 281.18
ELEVATION DATA: UPSTREAM(FEET) = 3512.68 DOWNSTREAM(FEET) = 3444.33

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.938
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.337
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	1.30	0.50	1.000	0	8.94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 2.15
TOTAL AREA(ACRES) = 1.30 PEAK FLOW RATE(CFS) = 2.15

****

FLOW PROCESS FROM NODE 10701.00 TO NODE 10702.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 3444.33 DOWNSTREAM(FEET) = 3246.68
CHANNEL LENGTH THRU SUBAREA(FEET) = 700.05 CHANNEL SLOPE = 0.2823
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.965
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.49	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.46
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.73
AVERAGE FLOW DEPTH(FEET) = 0.61 TRAVEL TIME(MIN.) = 2.04
Tc(MIN.) = 10.97
SUBAREA AREA(ACRES) = 6.49 SUBAREA RUNOFF(CFS) = 8.56
EFFECTIVE AREA(ACRES) = 7.79 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 7.8 PEAK FLOW RATE(CFS) = 10.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.73 FLOW VELOCITY(FEET/SEC.) = 6.47
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10702.00 = 981.23 FEET.

****

FLOW PROCESS FROM NODE 10702.00 TO NODE 10703.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

==========

```
  ELEVATION DATA: UPSTREAM(FEET) =   3246.68  DOWNSTREAM(FEET) =   3075.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1893.56   CHANNEL SLOPE =  0.0906
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.353
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.98      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.14
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   6.14
  Tc(MIN.) =   17.11
  SUBAREA AREA(ACRES) =    31.98       SUBAREA RUNOFF(CFS) =   24.53
  EFFECTIVE AREA(ACRES) =     39.77     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       39.8         PEAK FLOW RATE(CFS) =      30.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   5.55
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.00 =    2874.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.00 TO NODE  10703.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3075.14  DOWNSTREAM(FEET) =   2952.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2060.61   CHANNEL SLOPE =  0.0597
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.107
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.58      0.50     0.872     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.872
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.11
  AVERAGE FLOW DEPTH(FEET) =   1.64   TRAVEL TIME(MIN.) =   6.72
  Tc(MIN.) =   23.83
  SUBAREA AREA(ACRES) =    34.58       SUBAREA RUNOFF(CFS) =   20.87
  EFFECTIVE AREA(ACRES) =     74.35     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       74.4         PEAK FLOW RATE(CFS) =      42.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.66   FLOW VELOCITY(FEET/SEC.) =   5.16
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.50 =    4935.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.50 TO NODE  10704.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2952.03  DOWNSTREAM(FEET) =   2895.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.70   CHANNEL SLOPE =  0.0606
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.024
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.69      0.50     0.951     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.40
  AVERAGE FLOW DEPTH(FEET) =   1.76   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   26.70
  SUBAREA AREA(ACRES) =    30.69       SUBAREA RUNOFF(CFS) =   15.14
  EFFECTIVE AREA(ACRES) =    105.04     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      105.0         PEAK FLOW RATE(CFS) =      52.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.78   FLOW VELOCITY(FEET/SEC.) =   5.47
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10704.00 =    5866.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2895.59  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2585.44   CHANNEL SLOPE =  0.1217
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.916
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.40      0.50     0.977     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      90.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.13
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   5.30
  Tc(MIN.) =   32.00
  SUBAREA AREA(ACRES) =   199.40       SUBAREA RUNOFF(CFS) =   76.64
  EFFECTIVE AREA(ACRES) =    304.44     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      304.4         PEAK FLOW RATE(CFS) =     118.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.13   FLOW VELOCITY(FEET/SEC.) =   8.70
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =   1
```

```
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   32.00
  RAINFALL INTENSITY(INCH/HR) =   0.92
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     304.44
  TOTAL STREAM AREA(ACRES) =     304.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     118.60

****************************************************************************
  FLOW PROCESS FROM NODE  10710.00 TO NODE  10711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.64
  ELEVATION DATA: UPSTREAM(FEET) =   3389.13  DOWNSTREAM(FEET) =   3276.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.438
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.904
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                -        7.76      0.50     0.981     0   11.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.981
  SUBAREA RUNOFF(CFS) =      9.87
  TOTAL AREA(ACRES) =      7.76   PEAK FLOW RATE(CFS) =      9.87

****************************************************************************
  FLOW PROCESS FROM NODE  10711.00 TO NODE  10712.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3276.30  DOWNSTREAM(FEET) =   3152.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   950.69   CHANNEL SLOPE =  0.1305
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.542
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.39      0.50     0.988     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.988
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.74
  AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   2.76
  Tc(MIN.) =   14.20
  SUBAREA AREA(ACRES) =    22.39       SUBAREA RUNOFF(CFS) =   21.11
  EFFECTIVE AREA(ACRES) =     30.15     AREA-AVERAGED Fm(INCH/HR) =   0.49
```



```
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       30.1         PEAK FLOW RATE(CFS) =      28.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   6.26
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10712.00 =    1894.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10712.00 TO NODE  10713.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3152.26  DOWNSTREAM(FEET) =   2879.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.77   CHANNEL SLOPE =  0.1431
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.292
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       42.59      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.21
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   4.41
  Tc(MIN.) =   18.61
  SUBAREA AREA(ACRES) =    42.59       SUBAREA RUNOFF(CFS) =   30.37
  EFFECTIVE AREA(ACRES) =     72.74     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       72.7         PEAK FLOW RATE(CFS) =      52.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.52   FLOW VELOCITY(FEET/SEC.) =   7.50
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10713.00 =    3804.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.03  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2621.96   CHANNEL SLOPE =  0.1136
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.098
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      156.72      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      94.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.00
  AVERAGE FLOW DEPTH(FEET) =   1.99   TRAVEL TIME(MIN.) =   5.46
  Tc(MIN.) =   24.08
```

```
  SUBAREA AREA(ACRES) =   156.72       SUBAREA RUNOFF(CFS) =   84.37
  EFFECTIVE AREA(ACRES) =    229.46     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      229.5         PEAK FLOW RATE(CFS) =     123.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.19   FLOW VELOCITY(FEET/SEC.) =   8.58
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10720.00 =    6426.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.08
  RAINFALL INTENSITY(INCH/HR) =   1.10
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     229.46
  TOTAL STREAM AREA(ACRES) =     229.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     123.71

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      118.60   32.00    0.916  0.50( 0.48) 0.97     304.4   10700.00
      2      123.71   24.08    1.098  0.50( 0.50) 1.00     229.5   10710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      242.31   24.08    1.098  0.50( 0.49) 0.98     458.5   10710.00
      2      204.61   32.00    0.916  0.50( 0.49) 0.98     533.9   10700.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     242.31    Tc(MIN.) =    24.08
  EFFECTIVE AREA(ACRES) =     458.52   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =      533.9
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.00 TO NODE  10720.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.07  DOWNSTREAM(FEET) =   2523.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.13   CHANNEL SLOPE =  0.0339
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```



```
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.982
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.31      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     267.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.60
  AVERAGE FLOW DEPTH(FEET) =   3.67   TRAVEL TIME(MIN.) =   4.29
  Tc(MIN.) =   28.37
  SUBAREA AREA(ACRES) =   116.31       SUBAREA RUNOFF(CFS) =   50.38
  EFFECTIVE AREA(ACRES) =    574.83     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      650.2         PEAK FLOW RATE(CFS) =     252.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.60   FLOW VELOCITY(FEET/SEC.) =   6.51
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.50 =   10150.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.50 TO NODE  10721.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2523.48  DOWNSTREAM(FEET) =   2488.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1575.08   CHANNEL SLOPE =  0.0221
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.903
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.28      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     267.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   3.98   TRAVEL TIME(MIN.) =   4.66
  Tc(MIN.) =   33.02
  SUBAREA AREA(ACRES) =    82.28       SUBAREA RUNOFF(CFS) =   29.86
  EFFECTIVE AREA(ACRES) =    657.11     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      732.5         PEAK FLOW RATE(CFS) =     252.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.90   FLOW VELOCITY(FEET/SEC.) =   5.55
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.00 =   11725.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.00 TO NODE  10721.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2488.66  DOWNSTREAM(FEET) =   2453.35
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2032.11   CHANNEL SLOPE =  0.0174
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.825
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      259.52      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     290.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.25
  AVERAGE FLOW DEPTH(FEET) =   4.30   TRAVEL TIME(MIN.) =   6.45
  Tc(MIN.) =   39.48
  SUBAREA AREA(ACRES) =   259.52       SUBAREA RUNOFF(CFS) =   75.93
  EFFECTIVE AREA(ACRES) =    916.63     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      992.0         PEAK FLOW RATE(CFS) =     271.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.19   FLOW VELOCITY(FEET/SEC.) =   5.16
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.50 =   13757.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.50 TO NODE  10722.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.35  DOWNSTREAM(FEET) =   2384.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1842.37   CHANNEL SLOPE =  0.0374
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.787
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      229.78      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     301.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.06
  AVERAGE FLOW DEPTH(FEET) =   3.77   TRAVEL TIME(MIN.) =   4.35
  Tc(MIN.) =   43.83
  SUBAREA AREA(ACRES) =   229.78       SUBAREA RUNOFF(CFS) =   59.28
  EFFECTIVE AREA(ACRES) =   1146.41     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1221.8         PEAK FLOW RATE(CFS) =     299.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.76   FLOW VELOCITY(FEET/SEC.) =   7.05
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10722.00 =   15600.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10722.00 TO NODE  10723.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2384.52  DOWNSTREAM(FEET) =   1925.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3780.37   CHANNEL SLOPE =  0.1214
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.740
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      308.58      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     332.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.25
  AVERAGE FLOW DEPTH(FEET) =   3.14   TRAVEL TIME(MIN.) =   5.60
  Tc(MIN.) =   49.43
  SUBAREA AREA(ACRES) =   308.58       SUBAREA RUNOFF(CFS) =   66.54
  EFFECTIVE AREA(ACRES) =   1454.99     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1530.4         PEAK FLOW RATE(CFS) =     317.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.09   FLOW VELOCITY(FEET/SEC.) =  11.12
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10723.00 =   19380.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1925.64  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3826.73   CHANNEL SLOPE =  0.1582
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.710
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      434.11      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     358.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.66
  AVERAGE FLOW DEPTH(FEET) =   3.07   TRAVEL TIME(MIN.) =   5.04
  Tc(MIN.) =   54.47
  SUBAREA AREA(ACRES) =   434.11       SUBAREA RUNOFF(CFS) =   81.96
  EFFECTIVE AREA(ACRES) =   1889.10     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1964.5         PEAK FLOW RATE(CFS) =     360.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.08   FLOW VELOCITY(FEET/SEC.) =  12.68
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1964.5  TC(MIN.) =     54.47
  EFFECTIVE AREA(ACRES) =   1889.10  AREA-AVERAGED Fm(INCH/HR)=  0.50
```

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.996
PEAK FLOW RATE(CFS) = 360.41

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	360.41	54.47	0.710	0.50(0.50)	1.00	1889.1	10710.00
2	298.79	63.81	0.666	0.50(0.50)	0.99	1964.5	10700.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:
```

```
------------------------------------------------------------------------
  FILE NAME: S8.DAT
  TIME/DATE OF STUDY: 10:29 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.145
   2)   10.00;  2.038
   3)   15.00;  1.415
   4)   20.00;  1.217
   5)   25.00;  1.052
   6)   30.00;  0.929
   7)   40.00;  0.807
   8)   50.00;  0.724
   9)   60.00;  0.666
  10)   90.00;  0.567
  11)  120.00;  0.515
  12)  180.00;  0.439
  13)  360.00;  0.338
  14) 1440.00;  0.152
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10800.00 TO NODE  10801.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.93
  ELEVATION DATA: UPSTREAM(FEET) =   2617.19  DOWNSTREAM(FEET) =   2506.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.540
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.583
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"      -        0.83      0.50     1.000      0    7.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.56
  TOTAL AREA(ACRES) =      0.83   PEAK FLOW RATE(CFS) =      1.56

************************************************************************
  FLOW PROCESS FROM NODE  10801.00 TO NODE  10802.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2506.15  DOWNSTREAM(FEET) =   2237.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.01   CHANNEL SLOPE =  0.3968
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.187
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        5.30      0.50     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.31
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   1.79
  Tc(MIN.) =    9.33
  SUBAREA AREA(ACRES) =     5.30       SUBAREA RUNOFF(CFS) =    8.05
  EFFECTIVE AREA(ACRES) =      6.13     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.1          PEAK FLOW RATE(CFS) =       9.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   7.14
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10802.00 =     925.94 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10802.00 TO NODE  10803.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2237.54  DOWNSTREAM(FEET) =   1920.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =   954.74   CHANNEL SLOPE =  0.3325
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.879
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.25      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.18
  AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =   1.95
  Tc(MIN.) =   11.27
  SUBAREA AREA(ACRES) =    18.25       SUBAREA RUNOFF(CFS) =   22.65
  EFFECTIVE AREA(ACRES) =     24.38     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.4         PEAK FLOW RATE(CFS) =      30.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   9.02
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10803.00 =    1880.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1920.11  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2201.18   CHANNEL SLOPE =  0.2865
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.434
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.99      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.27
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   3.57
  Tc(MIN.) =   14.85
  SUBAREA AREA(ACRES) =    78.99       SUBAREA RUNOFF(CFS) =   66.40
  EFFECTIVE AREA(ACRES) =    103.37     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      103.4         PEAK FLOW RATE(CFS) =      86.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =  11.11
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```



```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S6.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2327.81   21.16  0.50( 0.50) 1.00    2635.3   10630.00
      2     2235.06   36.74  0.50( 0.50) 1.00    4568.5   10600.00
      3     2148.74   47.43  0.50( 0.50) 1.00    5901.3   10500.00
      4     2017.73   56.10  0.50( 0.50) 1.00    6884.3   10410.00
      5     1805.59   70.62  0.50( 0.50) 1.00    8318.8   10400.00
      6     1720.76   76.48  0.50( 0.50) 1.00    8809.3   10200.00
      7     1556.08   86.77  0.50( 0.50) 1.00    9538.7   10300.00
      8     1544.87   87.24  0.50( 0.50) 1.00    9560.9   10320.00
      9     1446.95   91.11  0.50( 0.50) 1.00    9669.6   10210.00
     10      523.97  143.59  0.50( 0.50) 1.00   10538.0   10100.00
    TOTAL AREA(ACRES) =    10538.0

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S7.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      360.41   54.47  0.50( 0.50) 1.00    1889.1   10710.00
      2      298.79   63.81  0.50( 0.50) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =     1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      360.41   54.47  0.50( 0.50) 1.00    1889.1   10710.00
      2      298.79   63.81  0.50( 0.50) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =      1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
     1      360.41   54.47    0.698  0.50( 0.50) 1.00    1889.1   10710.00
     2      298.79   63.81    0.653  0.50( 0.50) 0.99    1964.5   10700.00
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2327.81   21.16    1.179  0.50( 0.50) 1.00    2635.3   10630.00
      2     2235.06   36.74    0.847  0.50( 0.50) 1.00    4568.5   10600.00
      3     2148.74   47.43    0.745  0.50( 0.50) 1.00    5901.3   10500.00
      4     2017.73   56.10    0.689  0.50( 0.50) 1.00    6884.3   10410.00
      5     1805.59   70.62    0.631  0.50( 0.50) 1.00    8318.8   10400.00
      6     1720.76   76.48    0.612  0.50( 0.50) 1.00    8809.3   10200.00
      7     1556.08   86.77    0.578  0.50( 0.50) 1.00    9538.7   10300.00
      8     1544.87   87.24    0.576  0.50( 0.50) 1.00    9560.9   10320.00
      9     1446.95   91.11    0.565  0.50( 0.50) 1.00    9669.6   10210.00
     10      523.97  143.59    0.485  0.50( 0.50) 1.00   10538.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2688.23   21.16    1.179  0.50( 0.50) 1.00    3369.3   10630.00
      2     2595.48   36.74    0.847  0.50( 0.50) 1.00    5842.7   10600.00
      3     2509.15   47.43    0.745  0.50( 0.50) 1.00    7546.4   10500.00
      4     2402.84   54.47    0.698  0.50( 0.50) 1.00    8588.0   10710.00
      5     2367.36   56.10    0.689  0.50( 0.50) 1.00    8786.5   10410.00
      6     2203.84   63.81    0.653  0.50( 0.50) 1.00    9610.7   10700.00
      7     2061.35   70.62    0.631  0.50( 0.50) 1.00   10283.3   10400.00
      8     1939.47   76.48    0.612  0.50( 0.50) 1.00   10773.7   10200.00
      9     1709.79   86.77    0.578  0.50( 0.50) 1.00   11503.2   10300.00
     10     1695.59   87.24    0.576  0.50( 0.50) 1.00   11525.4   10320.00
     11     1576.55   91.11    0.565  0.50( 0.50) 1.00   11634.1   10210.00
     12      529.13  143.59    0.485  0.50( 0.50) 1.00   12502.4   10100.00
    TOTAL AREA(ACRES) =     12502.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2688.23  Tc(MIN.) =   21.161
  EFFECTIVE AREA(ACRES) =   3369.27  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12502.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10724.00 TO NODE  10820.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1320.32  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1341.06   CHANNEL SLOPE =  0.0231
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.106
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.66      0.50     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2701.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.19
  AVERAGE FLOW DEPTH(FEET) =   9.40   TRAVEL TIME(MIN.) =   2.19
  Tc(MIN.) =   23.36
  SUBAREA AREA(ACRES) =    47.66       SUBAREA RUNOFF(CFS) =   26.00
  EFFECTIVE AREA(ACRES) =   3416.93     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12550.1          PEAK FLOW RATE(CFS) =    2688.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.38   FLOW VELOCITY(FEET/SEC.) =  10.18
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2688.23   23.36    1.106  0.50( 0.50) 1.00    3416.9   10630.00
      2     2595.48   38.95    0.820  0.50( 0.50) 1.00    5890.4   10600.00
      3     2509.15   49.67    0.727  0.50( 0.50) 1.00    7594.0   10500.00
      4     2402.84   56.72    0.685  0.50( 0.50) 1.00    8635.7   10710.00
      5     2367.36   58.37    0.675  0.50( 0.50) 1.00    8834.2   10410.00
      6     2203.84   66.12    0.646  0.50( 0.50) 1.00    9658.3   10700.00
      7     2061.35   72.97    0.623  0.50( 0.50) 1.00   10331.0   10400.00
      8     1939.47   78.87    0.604  0.50( 0.50) 1.00   10821.4   10200.00
      9     1709.79   89.23    0.570  0.50( 0.50) 1.00   11550.8   10300.00
     10     1695.59   89.70    0.568  0.50( 0.50) 1.00   11573.1   10320.00
     11     1576.55   93.62    0.561  0.50( 0.50) 1.00   11681.7   10210.00
     12      529.13  146.89    0.481  0.50( 0.50) 1.00   12550.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       86.90   14.85    1.434  0.50( 0.50) 1.00     103.4   10800.00
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2719.09   14.85    1.434  0.50( 0.50) 1.00    2275.3   10800.00
      2     2744.61   23.36    1.106  0.50( 0.50) 1.00    3520.3   10630.00
      3     2625.21   38.95    0.820  0.50( 0.50) 1.00    5993.7   10600.00
      4     2530.23   49.67    0.727  0.50( 0.50) 1.00    7697.4   10500.00
      5     2420.03   56.72    0.685  0.50( 0.50) 1.00    8739.1   10710.00
      6     2383.67   58.37    0.675  0.50( 0.50) 1.00    8937.6   10410.00
      7     2217.39   66.12    0.646  0.50( 0.50) 1.00    9761.7   10700.00
      8     2072.79   72.97    0.623  0.50( 0.50) 1.00   10434.3   10400.00
      9     1949.10   78.87    0.604  0.50( 0.50) 1.00   10924.8   10200.00
     10     1716.24   89.23    0.570  0.50( 0.50) 1.00   11654.2   10300.00
```

```
    11     1701.90   89.70    0.568  0.50( 0.50) 1.00   11676.4   10320.00
    12     1582.18   93.62    0.561  0.50( 0.50) 1.00   11785.1   10210.00
    13      529.13  146.89    0.481  0.50( 0.50) 1.00   12653.5   10100.00
   TOTAL AREA(ACRES) =     12653.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2744.61  Tc(MIN.) =   23.355
  EFFECTIVE AREA(ACRES) =   3520.30  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12653.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1289.38  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2450.84   CHANNEL SLOPE =  0.0332
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.007
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.19      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2778.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.75
  AVERAGE FLOW DEPTH(FEET) =   8.88   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   26.83
  SUBAREA AREA(ACRES) =   147.19       SUBAREA RUNOFF(CFS) =   67.13
  EFFECTIVE AREA(ACRES) =   3667.49     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12800.7         PEAK FLOW RATE(CFS) =    2744.61
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.83   FLOW VELOCITY(FEET/SEC.) =  11.73
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.83
  RAINFALL INTENSITY(INCH/HR) =   1.01
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3667.49
  TOTAL STREAM AREA(ACRES) =   12800.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2744.61
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10830.00 TO NODE  10831.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.89
  ELEVATION DATA: UPSTREAM(FEET) =   3249.56  DOWNSTREAM(FEET) =   3166.67

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.939
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.273
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.88      0.50     1.000     0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.40
  TOTAL AREA(ACRES) =      0.88   PEAK FLOW RATE(CFS) =      1.40

****************************************************************************
  FLOW PROCESS FROM NODE  10831.00 TO NODE  10832.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3166.67  DOWNSTREAM(FEET) =   2954.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.65   CHANNEL SLOPE =  0.3126
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.889
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        2.82      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.00
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   2.26
  Tc(MIN.) =   11.20
  SUBAREA AREA(ACRES) =     2.82       SUBAREA RUNOFF(CFS) =    3.52
  EFFECTIVE AREA(ACRES) =      3.70     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =       4.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =   5.50
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10832.00 =     977.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10832.00 TO NODE  10833.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2954.84  DOWNSTREAM(FEET) =   2765.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.35   CHANNEL SLOPE =  0.1995
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.591
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       29.25      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.63
  AVERAGE FLOW DEPTH(FEET) =   0.98   TRAVEL TIME(MIN.) =   2.39
  Tc(MIN.) =   13.59
  SUBAREA AREA(ACRES) =    29.25       SUBAREA RUNOFF(CFS) =   28.70
  EFFECTIVE AREA(ACRES) =     32.95     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      32.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   7.57
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10833.00 =    1928.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10833.00 TO NODE  10834.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2765.08  DOWNSTREAM(FEET) =   2446.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.29   CHANNEL SLOPE =  0.1628
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.314
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.66      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.25
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   17.55
  SUBAREA AREA(ACRES) =    80.66       SUBAREA RUNOFF(CFS) =   59.08
  EFFECTIVE AREA(ACRES) =    113.61     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.6         PEAK FLOW RATE(CFS) =      83.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =   8.88
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10834.00 =    3888.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10834.00 TO NODE  10835.00 IS CODE =  51
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2446.09  DOWNSTREAM(FEET) =   1797.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2083.04   CHANNEL SLOPE =  0.3113
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.210
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      196.68      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     146.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.04
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   2.66
  Tc(MIN.) =   20.21
  SUBAREA AREA(ACRES) =   196.68       SUBAREA RUNOFF(CFS) =  125.63
  EFFECTIVE AREA(ACRES) =    310.29     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      310.3         PEAK FLOW RATE(CFS) =     198.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.17   FLOW VELOCITY(FEET/SEC.) =  14.04
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10835.00 =    5971.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1797.70  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3213.25   CHANNEL SLOPE =  0.1835
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.066
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      218.82      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     254.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.27
  AVERAGE FLOW DEPTH(FEET) =   2.63   TRAVEL TIME(MIN.) =   4.36
  Tc(MIN.) =   24.58
  SUBAREA AREA(ACRES) =   218.82       SUBAREA RUNOFF(CFS) =  111.41
  EFFECTIVE AREA(ACRES) =    529.11     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      529.1         PEAK FLOW RATE(CFS) =     269.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.68   FLOW VELOCITY(FEET/SEC.) =  12.48
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10840.00 =    9184.47 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   24.58
 RAINFALL INTENSITY(INCH/HR) =   1.07
 AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     529.11
 TOTAL STREAM AREA(ACRES) =     529.11
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     269.39

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2719.09   18.32    1.284  0.50( 0.50) 1.00    2422.5   10800.00
     1     2744.61   26.83    1.007  0.50( 0.50) 1.00    3667.5   10630.00
     1     2625.21   42.47    0.787  0.50( 0.50) 1.00    6140.9   10600.00
     1     2530.23   53.22    0.705  0.50( 0.50) 1.00    7844.6   10500.00
     1     2420.03   60.32    0.665  0.50( 0.50) 1.00    8886.3   10710.00
     1     2383.67   61.97    0.659  0.50( 0.50) 1.00    9084.8   10410.00
     1     2217.39   69.79    0.634  0.50( 0.50) 1.00    9908.9   10700.00
     1     2072.79   76.70    0.611  0.50( 0.50) 1.00   10581.5   10400.00
     1     1949.10   82.66    0.591  0.50( 0.50) 1.00   11072.0   10200.00
     1     1716.24   93.14    0.562  0.50( 0.50) 1.00   11801.4   10300.00
     1     1701.90   93.62    0.561  0.50( 0.50) 1.00   11823.6   10320.00
     1     1582.18   97.61    0.554  0.50( 0.50) 1.00   11932.3   10210.00
     1      529.13  152.15    0.474  0.50( 0.50) 1.00   12800.7   10100.00
     2      269.39   24.58    1.066  0.50( 0.50) 1.00     529.1   10830.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2988.48   18.32    1.284  0.50( 0.50) 1.00    2816.8   10800.00
     2     3007.25   24.58    1.066  0.50( 0.50) 1.00    3867.2   10830.00
     3     2985.94   26.83    1.007  0.50( 0.50) 1.00    4196.6   10630.00
     4     2761.56   42.47    0.787  0.50( 0.50) 1.00    6670.0   10600.00
     5     2627.92   53.22    0.705  0.50( 0.50) 1.00    8373.7   10500.00
     6     2498.49   60.32    0.665  0.50( 0.50) 1.00    9415.4   10710.00
     7     2459.52   61.97    0.659  0.50( 0.50) 1.00    9613.9   10410.00
     8     2280.95   69.79    0.634  0.50( 0.50) 1.00   10438.0   10700.00
     9     2125.50   76.70    0.611  0.50( 0.50) 1.00   11110.6   10400.00
    10     1992.44   82.66    0.591  0.50( 0.50) 1.00   11601.1   10200.00
    11     1745.45   93.14    0.562  0.50( 0.50) 1.00   12330.5   10300.00
    12     1730.72   93.62    0.561  0.50( 0.50) 1.00   12352.7   10320.00
    13     1607.71   97.61    0.554  0.50( 0.50) 1.00   12461.4   10210.00
    14      529.13  152.15    0.474  0.50( 0.50) 1.00   13329.8   10100.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    3007.25    Tc(MIN.) =    24.58
 EFFECTIVE AREA(ACRES) =    3867.19   AREA-AVERAGED Fm(INCH/HR) =  0.50
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 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =    13329.8
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10840.00 TO NODE  10841.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1208.07  DOWNSTREAM(FEET) =   1119.03
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3050.12   CHANNEL SLOPE =  0.0292
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.953
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      222.84      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3052.73
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.47
 AVERAGE FLOW DEPTH(FEET) =   9.42   TRAVEL TIME(MIN.) =   4.43
 Tc(MIN.) =   29.01
 SUBAREA AREA(ACRES) =   222.84       SUBAREA RUNOFF(CFS) =   90.89
 EFFECTIVE AREA(ACRES) =   4090.03     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    13552.6          PEAK FLOW RATE(CFS) =    3007.25
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.36   FLOW VELOCITY(FEET/SEC.) =  11.43
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10841.00 =   52177.71 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1119.03  DOWNSTREAM(FEET) =   1087.70
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.14   CHANNEL SLOPE =  0.0238
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.916
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      265.26      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3056.88
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.63
 AVERAGE FLOW DEPTH(FEET) =   9.79   TRAVEL TIME(MIN.) =   2.07
 Tc(MIN.) =   31.08
 SUBAREA AREA(ACRES) =   265.26       SUBAREA RUNOFF(CFS) =   99.23
 EFFECTIVE AREA(ACRES) =   4355.29     AREA-AVERAGED Fm(INCH/HR) =   0.50
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13817.9         PEAK FLOW RATE(CFS) =    3007.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.73   FLOW VELOCITY(FEET/SEC.) =  10.59
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.08
  RAINFALL INTENSITY(INCH/HR) =   0.92
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    4355.29
  TOTAL STREAM AREA(ACRES) =   13817.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    3007.25

****************************************************************************
  FLOW PROCESS FROM NODE  10850.00 TO NODE  10851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   311.88
  ELEVATION DATA: UPSTREAM(FEET) =   3029.66  DOWNSTREAM(FEET) =   2922.38

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.691
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.328
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.73      0.50     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.49
  TOTAL AREA(ACRES) =      2.73   PEAK FLOW RATE(CFS) =      4.49

****************************************************************************
  FLOW PROCESS FROM NODE  10851.00 TO NODE  10852.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2922.38  DOWNSTREAM(FEET) =   2684.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =   687.05   CHANNEL SLOPE =  0.3461
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.982
  SUBAREA LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.11      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.52
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   1.76
  Tc(MIN.) =   10.45
  SUBAREA AREA(ACRES) =     5.11       SUBAREA RUNOFF(CFS) =    6.82
  EFFECTIVE AREA(ACRES) =      7.84     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      10.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   7.02
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10852.00 =     998.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10852.00 TO NODE  10853.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2684.61  DOWNSTREAM(FEET) =   2306.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.58   CHANNEL SLOPE =  0.1966
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.469
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.02      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.79
  AVERAGE FLOW DEPTH(FEET) =   1.27   TRAVEL TIME(MIN.) =   4.12
  Tc(MIN.) =   14.57
  SUBAREA AREA(ACRES) =    60.02       SUBAREA RUNOFF(CFS) =   52.33
  EFFECTIVE AREA(ACRES) =     67.86     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =      59.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =   8.76
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10853.00 =    2923.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10853.00 TO NODE  10854.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2306.25  DOWNSTREAM(FEET) =   1555.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3225.53   CHANNEL SLOPE =  0.2329
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```

```
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.248
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -      235.82      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     139.19
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.56
AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   4.65
Tc(MIN.) =   19.22
SUBAREA AREA(ACRES) =   235.82       SUBAREA RUNOFF(CFS) =  158.69
EFFECTIVE AREA(ACRES) =    303.68     AREA-AVERAGED Fm(INCH/HR) =   0.50
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =      303.7         PEAK FLOW RATE(CFS) =     204.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  2.31   FLOW VELOCITY(FEET/SEC.) =  12.72
LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10854.00 =    6149.04 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1555.12  DOWNSTREAM(FEET) =   1087.70
CHANNEL LENGTH THRU SUBAREA(FEET) =  3294.22   CHANNEL SLOPE =  0.1419
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.083
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -      247.64      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     269.57
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.31
AVERAGE FLOW DEPTH(FEET) =   2.82   TRAVEL TIME(MIN.) =   4.85
Tc(MIN.) =   24.07
SUBAREA AREA(ACRES) =   247.64       SUBAREA RUNOFF(CFS) =  129.81
EFFECTIVE AREA(ACRES) =    551.32     AREA-AVERAGED Fm(INCH/HR) =   0.50
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =      551.3         PEAK FLOW RATE(CFS) =     289.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  2.89   FLOW VELOCITY(FEET/SEC.) =  11.50
LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10860.00 =    9443.26 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```



```
TIME OF CONCENTRATION(MIN.) =   24.07
RAINFALL INTENSITY(INCH/HR) =   1.08
AREA-AVERAGED Fm(INCH/HR) =  0.50
AREA-AVERAGED Fp(INCH/HR) =  0.50
AREA-AVERAGED Ap =  1.00
EFFECTIVE STREAM AREA(ACRES) =     551.32
TOTAL STREAM AREA(ACRES) =     551.32
PEAK FLOW RATE(CFS) AT CONFLUENCE =     289.00

** CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1     2988.48   24.81    1.058  0.50( 0.50) 1.00    3304.9   10800.00
    1     3007.25   31.08    0.916  0.50( 0.50) 1.00    4355.3   10830.00
    1     2985.94   33.34    0.888  0.50( 0.50) 1.00    4684.7   10630.00
    1     2761.56   49.11    0.731  0.50( 0.50) 1.00    7158.1   10600.00
    1     2627.92   59.95    0.666  0.50( 0.50) 1.00    8861.8   10500.00
    1     2498.49   67.13    0.642  0.50( 0.50) 1.00    9903.5   10710.00
    1     2459.52   68.82    0.637  0.50( 0.50) 1.00   10102.0   10410.00
    1     2280.95   76.77    0.611  0.50( 0.50) 1.00   10926.1   10700.00
    1     2125.50   83.80    0.587  0.50( 0.50) 1.00   11598.7   10400.00
    1     1992.44   89.88    0.567  0.50( 0.50) 1.00   12089.2   10200.00
    1     1745.45  100.60    0.549  0.50( 0.50) 1.00   12818.6   10300.00
    1     1730.72  101.11    0.548  0.50( 0.50) 1.00   12840.8   10320.00
    1     1607.71  105.23    0.541  0.50( 0.50) 1.00   12949.5   10210.00
    1      529.13  162.22    0.462  0.50( 0.50) 1.00   13817.9   10100.00
    2      289.00   24.07    1.083  0.50( 0.50) 1.00     551.3   10850.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1     3277.48   24.07    1.083  0.50( 0.50) 1.00    3757.3   10850.00
    2     3265.31   24.81    1.058  0.50( 0.50) 1.00    3856.3   10800.00
    3     3213.50   31.08    0.916  0.50( 0.50) 1.00    4906.6   10830.00
    4     3178.48   33.34    0.888  0.50( 0.50) 1.00    5236.0   10630.00
    5     2876.26   49.11    0.731  0.50( 0.50) 1.00    7709.5   10600.00
    6     2710.33   59.95    0.666  0.50( 0.50) 1.00    9413.1   10500.00
    7     2569.07   67.13    0.642  0.50( 0.50) 1.00   10454.8   10710.00
    8     2527.35   68.82    0.637  0.50( 0.50) 1.00   10653.3   10410.00
    9     2335.76   76.77    0.611  0.50( 0.50) 1.00   11477.4   10700.00
   10     2168.79   83.80    0.587  0.50( 0.50) 1.00   12150.1   10400.00
   11     2025.78   89.88    0.567  0.50( 0.50) 1.00   12640.5   10200.00
   12     1769.48  100.60    0.549  0.50( 0.50) 1.00   13369.9   10300.00
   13     1754.31  101.11    0.548  0.50( 0.50) 1.00   13392.1   10320.00
   14     1627.75  105.23    0.541  0.50( 0.50) 1.00   13500.8   10210.00
   15      529.13  162.22    0.462  0.50( 0.50) 1.00   14369.2   10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    3277.48    Tc(MIN.) =    24.07
EFFECTIVE AREA(ACRES) =    3757.33   AREA-AVERAGED Fm(INCH/HR) =  0.50
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
TOTAL AREA(ACRES) =    14369.2
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1087.70  DOWNSTREAM(FEET) =    961.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4791.22   CHANNEL SLOPE =  0.0264
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.915
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      402.51      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3352.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.32
  AVERAGE FLOW DEPTH(FEET) =   9.94   TRAVEL TIME(MIN.) =   7.05
  Tc(MIN.) =   31.13
  SUBAREA AREA(ACRES) =   402.51       SUBAREA RUNOFF(CFS) =  150.36
  EFFECTIVE AREA(ACRES) =   4159.84     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    14771.7         PEAK FLOW RATE(CFS) =    3277.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.85   FLOW VELOCITY(FEET/SEC.) =  11.25
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    14771.7  TC(MIN.) =     31.13
  EFFECTIVE AREA(ACRES) =   4159.84  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    3277.48

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3277.48   31.13    0.915  0.50( 0.50) 1.00    4159.8   10850.00
      2     3265.31   31.88    0.906  0.50( 0.50) 1.00    4258.8   10800.00
      3     3213.50   38.17    0.829  0.50( 0.50) 1.00    5309.1   10830.00
      4     3178.48   40.46    0.803  0.50( 0.50) 1.00    5638.5   10630.00
      5     2876.26   56.42    0.687  0.50( 0.50) 1.00    8112.0   10600.00
      6     2710.33   67.37    0.642  0.50( 0.50) 1.00    9815.6   10500.00
      7     2569.07   74.66    0.618  0.50( 0.50) 1.00   10857.3   10710.00
      8     2527.35   76.37    0.612  0.50( 0.50) 1.00   11055.8   10410.00
      9     2335.76   84.48    0.585  0.50( 0.50) 1.00   11879.9   10700.00
     10     2168.79   91.66    0.564  0.50( 0.50) 1.00   12552.6   10400.00
     11     2025.78   97.88    0.553  0.50( 0.50) 1.00   13043.0   10200.00
     12     1769.48  108.88    0.534  0.50( 0.50) 1.00   13772.4   10300.00
     13     1754.31  109.39    0.533  0.50( 0.50) 1.00   13794.7   10320.00
     14     1627.75  113.68    0.526  0.50( 0.50) 1.00   13903.3   10210.00
     15      529.13  173.41    0.447  0.50( 0.50) 1.00   14771.7   10100.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S9.DAT
  TIME/DATE OF STUDY: 10:30 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.145
   2)   10.00;  2.038
   3)   15.00;  1.415
   4)   20.00;  1.217
   5)   25.00;  1.052
   6)   30.00;  0.929
   7)   40.00;  0.807
   8)   50.00;  0.724
   9)   60.00;  0.666
  10)   90.00;  0.567
  11)  120.00;  0.515
  12)  180.00;  0.439
  13)  360.00;  0.338
  14) 1440.00;  0.152
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10900.00 TO NODE  10901.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   305.17
  ELEVATION DATA: UPSTREAM(FEET) =   3291.76  DOWNSTREAM(FEET) =   3104.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.671
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.554
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.19      0.50     1.000     0    7.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.20
  TOTAL AREA(ACRES) =      1.19   PEAK FLOW RATE(CFS) =      2.20

**************************************************************************
  FLOW PROCESS FROM NODE  10901.00 TO NODE  10902.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3104.08  DOWNSTREAM(FEET) =   2877.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   666.71   CHANNEL SLOPE =  0.3398
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.110
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        2.53      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.55
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   2.00
  Tc(MIN.) =    9.67
  SUBAREA AREA(ACRES) =     2.53       SUBAREA RUNOFF(CFS) =    3.67
  EFFECTIVE AREA(ACRES) =      3.72     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =       5.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   5.89
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10902.00 =     971.88 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10902.00 TO NODE  10903.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2877.50  DOWNSTREAM(FEET) =   2643.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.39   CHANNEL SLOPE =  0.1219
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.401
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.43      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   1.11   TRAVEL TIME(MIN.) =   5.67
  Tc(MIN.) =   15.35
  SUBAREA AREA(ACRES) =    36.43       SUBAREA RUNOFF(CFS) =   29.54
  EFFECTIVE AREA(ACRES) =     40.15     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.2         PEAK FLOW RATE(CFS) =      32.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   6.28
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10903.00 =    2888.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10903.00 TO NODE  10904.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2643.95  DOWNSTREAM(FEET) =   2373.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.90   CHANNEL SLOPE =  0.1400
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.246
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.07      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.21
  AVERAGE FLOW DEPTH(FEET) =   1.76   TRAVEL TIME(MIN.) =   3.92
  Tc(MIN.) =   19.27
  SUBAREA AREA(ACRES) =   129.07       SUBAREA RUNOFF(CFS) =   86.64
  EFFECTIVE AREA(ACRES) =    169.22     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      169.2         PEAK FLOW RATE(CFS) =     113.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.04   FLOW VELOCITY(FEET/SEC.) =   9.08
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10904.00 =    4820.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10904.00 TO NODE  10905.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2373.49  DOWNSTREAM(FEET) =   1817.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2764.66   CHANNEL SLOPE =  0.2010
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.104
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.70      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     145.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.06
  AVERAGE FLOW DEPTH(FEET) =   2.10   TRAVEL TIME(MIN.) =   4.17
  Tc(MIN.) =   23.43
  SUBAREA AREA(ACRES) =   117.70       SUBAREA RUNOFF(CFS) =   63.93
  EFFECTIVE AREA(ACRES) =    286.92     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.9         PEAK FLOW RATE(CFS) =     155.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.15   FLOW VELOCITY(FEET/SEC.) =  11.25
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10905.00 =    7584.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10905.00 TO NODE  10906.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1817.76  DOWNSTREAM(FEET) =   1387.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2799.36   CHANNEL SLOPE =  0.1536
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.989
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      363.93      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     236.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.27
  AVERAGE FLOW DEPTH(FEET) =   2.64   TRAVEL TIME(MIN.) =   4.14
  Tc(MIN.) =   27.57
  SUBAREA AREA(ACRES) =   363.93       SUBAREA RUNOFF(CFS) =  160.01
  EFFECTIVE AREA(ACRES) =    650.85     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.8         PEAK FLOW RATE(CFS) =     286.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.84   FLOW VELOCITY(FEET/SEC.) =  11.82
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10906.00 =   10384.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1387.73  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2484.63   CHANNEL SLOPE =  0.1103
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.911
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.85      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     296.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.55
  AVERAGE FLOW DEPTH(FEET) =   3.06   TRAVEL TIME(MIN.) =   3.93
  Tc(MIN.) =   31.50
  SUBAREA AREA(ACRES) =    56.85       SUBAREA RUNOFF(CFS) =   21.00
  EFFECTIVE AREA(ACRES) =    707.70     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      707.7         PEAK FLOW RATE(CFS) =     286.16
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.02   FLOW VELOCITY(FEET/SEC.) =  10.47
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10920.00 =   12868.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.50
  RAINFALL INTENSITY(INCH/HR) =   0.91
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     707.70
  TOTAL STREAM AREA(ACRES) =     707.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     286.16

****************************************************************************
  FLOW PROCESS FROM NODE  10910.00 TO NODE  10911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   287.29
  ELEVATION DATA: UPSTREAM(FEET) =   3119.43  DOWNSTREAM(FEET) =   3044.59

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.891
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.283
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.91      0.50     1.000     0    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.07
  TOTAL AREA(ACRES) =      1.91   PEAK FLOW RATE(CFS) =      3.07

****************************************************************************
  FLOW PROCESS FROM NODE  10911.00 TO NODE  10912.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3044.59  DOWNSTREAM(FEET) =   2980.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.50   CHANNEL SLOPE =  0.1015
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.834
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.16      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.81
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.75
  Tc(MIN.) =   11.64
  SUBAREA AREA(ACRES) =     4.16       SUBAREA RUNOFF(CFS) =    4.99
  EFFECTIVE AREA(ACRES) =      6.07     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =       7.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   4.04
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10912.00 =     914.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10912.00 TO NODE  10913.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2980.93  DOWNSTREAM(FEET) =   2876.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =   984.99   CHANNEL SLOPE =  0.1065
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.432
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.86      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.09
```

```
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =   14.86
  SUBAREA AREA(ACRES) =    22.86       SUBAREA RUNOFF(CFS) =   19.18
  EFFECTIVE AREA(ACRES) =     28.93     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.9         PEAK FLOW RATE(CFS) =      24.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOW VELOCITY(FEET/SEC.) =   5.59
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10913.00 =    1899.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10913.00 TO NODE  10914.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2876.01  DOWNSTREAM(FEET) =   2832.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   939.99   CHANNEL SLOPE =  0.0465
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.289
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.02      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.73
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   18.18
  SUBAREA AREA(ACRES) =    53.02       SUBAREA RUNOFF(CFS) =   37.65
  EFFECTIVE AREA(ACRES) =     81.95     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       81.9         PEAK FLOW RATE(CFS) =      58.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =   5.07
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10914.00 =    2839.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10914.00 TO NODE  10915.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2832.29  DOWNSTREAM(FEET) =   2769.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1006.52   CHANNEL SLOPE =  0.0623
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.189
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.80      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      86.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.25
  AVERAGE FLOW DEPTH(FEET) =   2.15   TRAVEL TIME(MIN.) =   2.69
  Tc(MIN.) =   20.86
  SUBAREA AREA(ACRES) =    90.80       SUBAREA RUNOFF(CFS) =   56.25
  EFFECTIVE AREA(ACRES) =    172.75     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      172.8         PEAK FLOW RATE(CFS) =     107.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.32   FLOW VELOCITY(FEET/SEC.) =   6.60
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10915.00 =    3846.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10915.00 TO NODE  10916.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2769.58  DOWNSTREAM(FEET) =   2453.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3003.36   CHANNEL SLOPE =  0.1053
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.020
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      311.96      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     180.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.17
  AVERAGE FLOW DEPTH(FEET) =   2.56   TRAVEL TIME(MIN.) =   5.46
  Tc(MIN.) =   26.32
  SUBAREA AREA(ACRES) =   311.96       SUBAREA RUNOFF(CFS) =  145.81
  EFFECTIVE AREA(ACRES) =    484.71     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      484.7         PEAK FLOW RATE(CFS) =     226.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.79   FLOW VELOCITY(FEET/SEC.) =   9.71
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10916.00 =    6849.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10916.00 TO NODE  10917.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.21  DOWNSTREAM(FEET) =   1787.18
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2846.14   CHANNEL SLOPE =  0.2340
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.935
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.62      0.50     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     273.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.73
  AVERAGE FLOW DEPTH(FEET) =   2.58   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   29.77
  SUBAREA AREA(ACRES) =   238.62       SUBAREA RUNOFF(CFS) =   93.28
  EFFECTIVE AREA(ACRES) =    723.33     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      723.3         PEAK FLOW RATE(CFS) =     282.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.61   FLOW VELOCITY(FEET/SEC.) =  13.81
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10917.00 =    9695.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10917.00 TO NODE  10918.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1787.18  DOWNSTREAM(FEET) =   1279.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2918.23   CHANNEL SLOPE =  0.1741
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.885
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      150.63      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     308.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.62
  AVERAGE FLOW DEPTH(FEET) =   2.86   TRAVEL TIME(MIN.) =   3.85
  Tc(MIN.) =   33.63
  SUBAREA AREA(ACRES) =   150.63       SUBAREA RUNOFF(CFS) =   52.13
  EFFECTIVE AREA(ACRES) =    873.96     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      874.0         PEAK FLOW RATE(CFS) =     302.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.83   FLOW VELOCITY(FEET/SEC.) =  12.56
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10918.00 =   12614.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1279.22  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.50   CHANNEL SLOPE =  0.0995
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.852
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.16      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     311.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.29
  AVERAGE FLOW DEPTH(FEET) =   3.18   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   36.32
  SUBAREA AREA(ACRES) =    60.16       SUBAREA RUNOFF(CFS) =   19.04
  EFFECTIVE AREA(ACRES) =    934.12     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      934.1         PEAK FLOW RATE(CFS) =     302.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.15   FLOW VELOCITY(FEET/SEC.) =  10.19
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   36.32
  RAINFALL INTENSITY(INCH/HR) =   0.85
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     934.12
  TOTAL STREAM AREA(ACRES) =     934.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     302.45

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      286.16   31.50    0.911  0.50( 0.50) 1.00     707.7   10900.00
      2      302.45   36.32    0.852  0.50( 0.50) 1.00     934.1   10910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      588.61   31.50    0.911  0.50( 0.50) 1.00    1517.7   10900.00
      2      547.57   36.32    0.852  0.50( 0.50) 1.00    1641.8   10910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     588.61    Tc(MIN.) =    31.50
  EFFECTIVE AREA(ACRES) =    1517.73   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1641.8
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE =  51
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1113.60  DOWNSTREAM(FEET) =    961.06
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2282.16   CHANNEL SLOPE =  0.0668
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.867
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      185.67      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     619.23
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.52
 AVERAGE FLOW DEPTH(FEET) =   4.43   TRAVEL TIME(MIN.) =   3.62
 Tc(MIN.) =   35.12
 SUBAREA AREA(ACRES) =   185.67       SUBAREA RUNOFF(CFS) =   61.23
 EFFECTIVE AREA(ACRES) =   1703.40     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1827.5         PEAK FLOW RATE(CFS) =     588.61
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.35   FLOW VELOCITY(FEET/SEC.) =  10.39
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10921.00 =   16560.68 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1827.5  TC(MIN.) =     35.12
 EFFECTIVE AREA(ACRES) =   1703.40  AREA-AVERAGED Fm(INCH/HR)=  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =     588.61

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      588.61   35.12    0.867  0.50( 0.50) 1.00    1703.4   10900.00
     2      547.57   40.02    0.807  0.50( 0.50) 1.00    1827.5   10910.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S10.DAT
  TIME/DATE OF STUDY: 10:30 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.065
   2)   10.00;  1.994
   3)   15.00;  1.398
   4)   20.00;  1.201
   5)   25.00;  1.039
   6)   30.00;  0.920
   7)   40.00;  0.798
   8)   50.00;  0.714
   9)   60.00;  0.656
  10)   90.00;  0.556
  11)  120.00;  0.503
  12)  180.00;  0.428
  13)  360.00;  0.327
  14) 1440.00;  0.147
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11000.00 TO NODE  11001.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   362.38
  ELEVATION DATA: UPSTREAM(FEET) =   2528.19  DOWNSTREAM(FEET) =   2375.55

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.863
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.238
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        2.03      0.50     1.000     0    8.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.17
  TOTAL AREA(ACRES) =      2.03   PEAK FLOW RATE(CFS) =      3.17

************************************************************************
  FLOW PROCESS FROM NODE  11001.00 TO NODE  11002.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2375.55  DOWNSTREAM(FEET) =   2005.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.45   CHANNEL SLOPE =  0.6438
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.976
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        3.14      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.44
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   1.29
  Tc(MIN.) =   10.15
  SUBAREA AREA(ACRES) =     3.14       SUBAREA RUNOFF(CFS) =    4.17
  EFFECTIVE AREA(ACRES) =      5.17     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2         PEAK FLOW RATE(CFS) =       6.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   7.94
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11002.00 =     937.83 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11002.00 TO NODE  11003.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2005.09  DOWNSTREAM(FEET) =   1450.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.43   CHANNEL SLOPE =  0.5763
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.775
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.53      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.50
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   1.69
  Tc(MIN.) =   11.84
  SUBAREA AREA(ACRES) =    16.53       SUBAREA RUNOFF(CFS) =   18.96
  EFFECTIVE AREA(ACRES) =     21.70     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.7         PEAK FLOW RATE(CFS) =      24.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.89   FLOW VELOCITY(FEET/SEC.) =  10.52
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11003.00 =    1900.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.44  DOWNSTREAM(FEET) =    939.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1351.71   CHANNEL SLOPE =  0.3779
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.509
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.99      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.12
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   14.07
  SUBAREA AREA(ACRES) =    30.99       SUBAREA RUNOFF(CFS) =   28.15
  EFFECTIVE AREA(ACRES) =     52.69     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       52.7         PEAK FLOW RATE(CFS) =      47.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =  10.62
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
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============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S8.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     3277.48   31.13  0.50( 0.50) 1.00    4159.8   10850.00
      2     3265.31   31.88  0.50( 0.50) 1.00    4258.8   10800.00
      3     3213.50   38.17  0.50( 0.50) 1.00    5309.1   10830.00
      4     3178.48   40.46  0.50( 0.50) 1.00    5638.5   10630.00
      5     2876.26   56.42  0.50( 0.50) 1.00    8112.0   10600.00
      6     2710.33   67.37  0.50( 0.50) 1.00    9815.6   10500.00
      7     2569.07   74.66  0.50( 0.50) 1.00   10857.3   10710.00
      8     2527.35   76.37  0.50( 0.50) 1.00   11055.8   10410.00
      9     2335.76   84.48  0.50( 0.50) 1.00   11879.9   10700.00
     10     2168.79   91.66  0.50( 0.50) 1.00   12552.6   10400.00
     11     2025.78   97.88  0.50( 0.50) 1.00   13043.0   10200.00
     12     1769.48  108.88  0.50( 0.50) 1.00   13772.4   10300.00
     13     1754.31  109.39  0.50( 0.50) 1.00   13794.7   10320.00
     14     1627.75  113.68  0.50( 0.50) 1.00   13903.3   10210.00
     15      529.13  173.41  0.50( 0.50) 1.00   14771.7   10100.00
    TOTAL AREA(ACRES) =    14771.7

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S9.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      588.61   35.12  0.50( 0.50) 1.00    1703.4   10900.00
      2      547.57   40.02  0.50( 0.50) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =     1827.5

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      588.61   35.12  0.50( 0.50) 1.00    1703.4   10900.00
      2      547.57   40.02  0.50( 0.50) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =      1827.5

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
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================================================================================
```

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	588.61	35.12	0.858	0.50(0.50)	1.00	1703.4	10900.00
2	547.57	40.02	0.798	0.50(0.50)	1.00	1827.5	10910.00

LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3277.48	31.13	0.906	0.50(0.50)	1.00	4159.8	10850.00
2	3265.31	31.88	0.897	0.50(0.50)	1.00	4258.8	10800.00
3	3213.50	38.17	0.820	0.50(0.50)	1.00	5309.1	10830.00
4	3178.48	40.46	0.794	0.50(0.50)	1.00	5638.5	10630.00
5	2876.26	56.42	0.677	0.50(0.50)	1.00	8112.0	10600.00
6	2710.33	67.37	0.631	0.50(0.50)	1.00	9815.6	10500.00
7	2569.07	74.66	0.607	0.50(0.50)	1.00	10857.3	10710.00
8	2527.35	76.37	0.601	0.50(0.50)	1.00	11055.8	10410.00
9	2335.76	84.48	0.574	0.50(0.50)	1.00	11879.9	10700.00
10	2168.79	91.66	0.553	0.50(0.50)	1.00	12552.6	10400.00
11	2025.78	97.88	0.542	0.50(0.50)	1.00	13043.0	10200.00
12	1769.48	108.88	0.523	0.50(0.50)	1.00	13772.4	10300.00
13	1754.31	109.39	0.522	0.50(0.50)	1.00	13794.7	10320.00
14	1627.75	113.68	0.514	0.50(0.50)	1.00	13903.3	10210.00
15	529.13	173.41	0.436	0.50(0.50)	1.00	14771.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3866.09	31.13	0.906	0.50(0.50)	1.00	5669.7	10850.00
2	3853.92	31.88	0.897	0.50(0.50)	1.00	5805.1	10800.00
3	3827.27	35.12	0.858	0.50(0.50)	1.00	6502.5	10900.00
4	3776.51	38.17	0.820	0.50(0.50)	1.00	7089.9	10830.00
5	3732.82	40.02	0.798	0.50(0.50)	1.00	7402.3	10910.00
6	3719.23	40.46	0.794	0.50(0.50)	1.00	7466.0	10630.00
7	3201.00	56.42	0.677	0.50(0.50)	1.00	9939.5	10600.00
8	2951.73	67.37	0.631	0.50(0.50)	1.00	11643.1	10500.00
9	2765.77	74.66	0.607	0.50(0.50)	1.00	12684.8	10710.00
10	2713.58	76.37	0.601	0.50(0.50)	1.00	12883.3	10410.00
11	2472.22	84.48	0.574	0.50(0.50)	1.00	13707.4	10700.00
12	2266.04	91.66	0.553	0.50(0.50)	1.00	14380.1	10400.00
13	2102.82	97.88	0.542	0.50(0.50)	1.00	14870.5	10200.00
14	1810.77	108.88	0.523	0.50(0.50)	1.00	15599.9	10300.00
15	1793.94	109.39	0.522	0.50(0.50)	1.00	15622.1	10320.00
16	1653.43	113.68	0.514	0.50(0.50)	1.00	15730.8	10210.00
17	529.13	173.41	0.436	0.50(0.50)	1.00	16599.2	10100.00

TOTAL AREA(ACRES) = 16599.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3866.09 Tc(MIN.) = 31.126
EFFECTIVE AREA(ACRES) = 5669.74 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 16599.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.


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********************************************************************************
  FLOW PROCESS FROM NODE  10921.00 TO NODE  11020.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    961.06  DOWNSTREAM(FEET) =    939.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =   601.65   CHANNEL SLOPE =  0.0356
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.898
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       18.29      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3869.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.04
  AVERAGE FLOW DEPTH(FEET) =   9.26   TRAVEL TIME(MIN.) =   0.67
  Tc(MIN.) =   31.79
  SUBAREA AREA(ACRES) =    18.29       SUBAREA RUNOFF(CFS) =    6.55
  EFFECTIVE AREA(ACRES) =   5688.03     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    16617.5          PEAK FLOW RATE(CFS) =    3866.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.26   FLOW VELOCITY(FEET/SEC.) =  15.04
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================
```

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3866.09	31.79	0.898	0.50(0.50)	1.00	5688.0	10850.00
2	3853.92	32.54	0.889	0.50(0.50)	1.00	5823.4	10800.00
3	3827.27	35.78	0.849	0.50(0.50)	1.00	6520.8	10900.00
4	3776.51	38.84	0.812	0.50(0.50)	1.00	7108.2	10830.00
5	3732.82	40.69	0.792	0.50(0.50)	1.00	7420.6	10910.00
6	3719.23	41.13	0.789	0.50(0.50)	1.00	7484.3	10630.00
7	3201.00	57.12	0.673	0.50(0.50)	1.00	9957.8	10600.00
8	2951.73	68.08	0.629	0.50(0.50)	1.00	11661.4	10500.00
9	2765.77	75.38	0.605	0.50(0.50)	1.00	12703.1	10710.00
10	2713.58	77.10	0.599	0.50(0.50)	1.00	12901.6	10410.00
11	2472.22	85.23	0.572	0.50(0.50)	1.00	13725.7	10700.00
12	2266.04	92.42	0.552	0.50(0.50)	1.00	14398.3	10400.00
13	2102.82	98.65	0.541	0.50(0.50)	1.00	14888.8	10200.00
14	1810.77	109.68	0.521	0.50(0.50)	1.00	15618.2	10300.00
15	1793.94	110.20	0.520	0.50(0.50)	1.00	15640.4	10320.00
16	1653.43	114.50	0.513	0.50(0.50)	1.00	15749.1	10210.00
17	529.13	174.50	0.435	0.50(0.50)	1.00	16617.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

```
 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       47.86   14.07    1.509  0.50( 0.50) 1.00      52.7   11000.00
 LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3913.94   14.07    1.509  0.50( 0.50) 1.00    2569.2   11000.00
     2     3884.96   31.79    0.898  0.50( 0.50) 1.00    5740.7   10850.00
     3     3872.36   32.54    0.889  0.50( 0.50) 1.00    5876.1   10800.00
     4     3843.83   35.78    0.849  0.50( 0.50) 1.00    6573.5   10900.00
     5     3791.30   38.84    0.812  0.50( 0.50) 1.00    7160.9   10830.00
     6     3746.67   40.69    0.792  0.50( 0.50) 1.00    7473.3   10910.00
     7     3732.90   41.13    0.789  0.50( 0.50) 1.00    7537.0   10630.00
     8     3209.18   57.12    0.673  0.50( 0.50) 1.00   10010.4   10600.00
     9     2957.84   68.08    0.629  0.50( 0.50) 1.00   11714.1   10500.00
    10     2770.73   75.38    0.605  0.50( 0.50) 1.00   12755.8   10710.00
    11     2718.26   77.10    0.599  0.50( 0.50) 1.00   12954.3   10410.00
    12     2475.62   85.23    0.572  0.50( 0.50) 1.00   13778.4   10700.00
    13     2268.48   92.42    0.552  0.50( 0.50) 1.00   14451.0   10400.00
    14     2104.74   98.65    0.541  0.50( 0.50) 1.00   14941.5   10200.00
    15     1811.77  109.68    0.521  0.50( 0.50) 1.00   15670.9   10300.00
    16     1794.89  110.20    0.520  0.50( 0.50) 1.00   15693.1   10320.00
    17     1654.02  114.50    0.513  0.50( 0.50) 1.00   15801.8   10210.00
    18      529.13  174.50    0.435  0.50( 0.50) 1.00   16670.2   10100.00
   TOTAL AREA(ACRES) =     16670.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     3913.94  Tc(MIN.) =   14.066
 EFFECTIVE AREA(ACRES) =   2569.17  AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =    16670.2
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11020.00 TO NODE  11021.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    939.63  DOWNSTREAM(FEET) =    865.22
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2876.19   CHANNEL SLOPE =  0.0259
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.294
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      191.02      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3982.25
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.44
 AVERAGE FLOW DEPTH(FEET) =   9.94   TRAVEL TIME(MIN.) =   3.57
 Tc(MIN.) =   17.63
```



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 SUBAREA AREA(ACRES) =   191.02       SUBAREA RUNOFF(CFS) =  136.52
 EFFECTIVE AREA(ACRES) =   2760.19     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    16861.2         PEAK FLOW RATE(CFS) =    3913.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.88   FLOW VELOCITY(FEET/SEC.) =  13.38
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11021.00 =   61764.91 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11021.00 TO NODE  11022.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    865.22  DOWNSTREAM(FEET) =    752.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.47   CHANNEL SLOPE =  0.0389
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.178
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      320.06      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4011.70
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.70
 AVERAGE FLOW DEPTH(FEET) =   9.23   TRAVEL TIME(MIN.) =   3.07
 Tc(MIN.) =   20.70
 SUBAREA AREA(ACRES) =   320.06       SUBAREA RUNOFF(CFS) =  195.31
 EFFECTIVE AREA(ACRES) =   3080.25     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    17181.2         PEAK FLOW RATE(CFS) =    3913.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.14   FLOW VELOCITY(FEET/SEC.) =  15.60
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11022.00 =   64657.38 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11022.00 TO NODE  11023.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    752.60  DOWNSTREAM(FEET) =    737.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.15   CHANNEL SLOPE =  0.0081
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.062
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      226.98      0.50     0.986     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3972.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.69
  AVERAGE FLOW DEPTH(FEET) =  12.34   TRAVEL TIME(MIN.) =   3.57
  Tc(MIN.) =   24.28
  SUBAREA AREA(ACRES) =   226.98       SUBAREA RUNOFF(CFS) =  116.28
  EFFECTIVE AREA(ACRES) =   3307.23     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17408.2         PEAK FLOW RATE(CFS) =    3913.94
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.27   FLOW VELOCITY(FEET/SEC.) =   8.66
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11023.00 =   66521.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    737.50  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2632.50   CHANNEL SLOPE =  0.0222
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.974
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.84      0.50     0.992     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3940.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.67
  AVERAGE FLOW DEPTH(FEET) =  10.18   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   27.74
  SUBAREA AREA(ACRES) =   124.84       SUBAREA RUNOFF(CFS) =   53.66
  EFFECTIVE AREA(ACRES) =   3432.07     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17533.1         PEAK FLOW RATE(CFS) =    3913.94
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.16   FLOW VELOCITY(FEET/SEC.) =  12.64
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11363.00 =   69154.02 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    17533.1  TC(MIN.) =     27.74
  EFFECTIVE AREA(ACRES) =   3432.07  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.998
  PEAK FLOW RATE(CFS)   =    3913.94

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3913.94   27.74    0.974  0.50( 0.50) 1.00    3432.1   11000.00
      2     3884.96   45.52    0.752  0.50( 0.50) 1.00    6603.6   10850.00
      3     3872.36   46.28    0.745  0.50( 0.50) 1.00    6739.0   10800.00
      4     3843.83   49.55    0.718  0.50( 0.50) 1.00    7436.4   10900.00
```



```
      5     3791.30   52.66    0.699  0.50( 0.50) 1.00    8023.8   10830.00
      6     3746.67   54.55    0.688  0.50( 0.50) 1.00    8336.2   10910.00
      7     3732.90   55.01    0.685  0.50( 0.50) 1.00    8399.9   10630.00
      8     3209.18   71.54    0.618  0.50( 0.50) 1.00   10873.3   10600.00
      9     2957.84   82.80    0.580  0.50( 0.50) 1.00   12577.0   10500.00
     10     2770.73   90.35    0.555  0.50( 0.50) 1.00   13618.7   10710.00
     11     2718.26   92.13    0.552  0.50( 0.50) 1.00   13817.2   10410.00
     12     2475.62  100.62    0.537  0.50( 0.50) 1.00   14641.3   10700.00
     13     2268.48  108.15    0.524  0.50( 0.50) 1.00   15313.9   10400.00
     14     2104.74  114.69    0.512  0.50( 0.50) 1.00   15804.4   10200.00
     15     1811.77  126.33    0.495  0.50( 0.50) 1.00   16533.8   10300.00
     16     1794.89  126.88    0.494  0.50( 0.50) 1.00   16556.0   10320.00
     17     1654.02  131.54    0.489  0.50( 0.50) 1.00   16664.7   10210.00
     18      529.13  197.15    0.418  0.50( 0.50) 1.00   17533.1   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S11.DAT
  TIME/DATE OF STUDY: 10:30 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.065
   2)   10.00;  1.994
   3)   15.00;  1.398
   4)   20.00;  1.201
   5)   25.00;  1.039
   6)   30.00;  0.920
   7)   40.00;  0.798
   8)   50.00;  0.714
   9)   60.00;  0.656
  10)   90.00;  0.556
  11)  120.00;  0.503
  12)  180.00;  0.428
  13)  360.00;  0.327
  14) 1440.00;  0.147
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11101.00 TO NODE  11102.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   920.30
  ELEVATION DATA: UPSTREAM(FEET) =   4391.58  DOWNSTREAM(FEET) =   4080.28

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.444
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.583
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.68      0.50     1.000     0   13.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.61
  TOTAL AREA(ACRES) =      2.68   PEAK FLOW RATE(CFS) =      2.61

**************************************************************************
  FLOW PROCESS FROM NODE  11102.00 TO NODE  11103.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4080.28  DOWNSTREAM(FEET) =   3876.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.85   CHANNEL SLOPE =  0.2123
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.366
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.96      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.73
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   2.38
  Tc(MIN.) =   15.82
  SUBAREA AREA(ACRES) =    39.96       SUBAREA RUNOFF(CFS) =   31.12
  EFFECTIVE AREA(ACRES) =     42.64     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       42.6         PEAK FLOW RATE(CFS) =      33.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   7.78
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11103.00 =    1880.15 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11103.00 TO NODE  11104.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   3876.52  DOWNSTREAM(FEET) =   3625.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1902.80   CHANNEL SLOPE =  0.1317
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.199
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.64      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.46
  AVERAGE FLOW DEPTH(FEET) =   1.60   TRAVEL TIME(MIN.) =   4.25
  Tc(MIN.) =   20.07
  SUBAREA AREA(ACRES) =    75.64       SUBAREA RUNOFF(CFS) =   47.54
  EFFECTIVE AREA(ACRES) =    118.28     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.3         PEAK FLOW RATE(CFS) =      74.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =   7.95
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11104.00 =    3782.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11104.00 TO NODE  11105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3625.86  DOWNSTREAM(FEET) =   3222.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2898.91   CHANNEL SLOPE =  0.1391
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.030
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      167.73      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     114.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.09
  AVERAGE FLOW DEPTH(FEET) =   2.05   TRAVEL TIME(MIN.) =   5.32
  Tc(MIN.) =   25.39
  SUBAREA AREA(ACRES) =   167.73       SUBAREA RUNOFF(CFS) =   79.94
  EFFECTIVE AREA(ACRES) =    286.01     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.0         PEAK FLOW RATE(CFS) =     136.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.19   FLOW VELOCITY(FEET/SEC.) =   9.45
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11105.00 =    6681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3222.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2480.35   CHANNEL SLOPE =  0.1089
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.924
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      252.33      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     184.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.33
  AVERAGE FLOW DEPTH(FEET) =   2.57   TRAVEL TIME(MIN.) =   4.43
  Tc(MIN.) =   29.82
  SUBAREA AREA(ACRES) =   252.33       SUBAREA RUNOFF(CFS) =   96.31
  EFFECTIVE AREA(ACRES) =    538.34     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      538.3         PEAK FLOW RATE(CFS) =     205.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.68   FLOW VELOCITY(FEET/SEC.) =   9.57
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11121.00 =    9162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.82
  RAINFALL INTENSITY(INCH/HR) =   0.92
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     538.34
  TOTAL STREAM AREA(ACRES) =     538.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     205.48

****************************************************************************
  FLOW PROCESS FROM NODE  11111.00 TO NODE  11112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   329.73
  ELEVATION DATA: UPSTREAM(FEET) =   4094.14  DOWNSTREAM(FEET) =   3956.68

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.552
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.304
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
```

```
  "CHAPARRAL,BROADLEAF"      -        1.49      0.50     1.000     0    8.55
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.42
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      2.42

****************************************************************************
  FLOW PROCESS FROM NODE  11112.00 TO NODE  11113.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3956.68  DOWNSTREAM(FEET) =   3752.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.35   CHANNEL SLOPE =  0.3066
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.960
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.55      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.40
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   1.73
  Tc(MIN.) =   10.29
  SUBAREA AREA(ACRES) =     9.55       SUBAREA RUNOFF(CFS) =   12.55
  EFFECTIVE AREA(ACRES) =     11.04     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       11.0         PEAK FLOW RATE(CFS) =      14.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   7.31
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11113.00 =     995.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11113.00 TO NODE  11114.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3752.68  DOWNSTREAM(FEET) =   3541.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   955.83   CHANNEL SLOPE =  0.2209
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.712
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.09      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.67
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   2.08
  Tc(MIN.) =   12.36
  SUBAREA AREA(ACRES) =    26.09       SUBAREA RUNOFF(CFS) =   28.46
```



```
  EFFECTIVE AREA(ACRES) =     37.13     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.1         PEAK FLOW RATE(CFS) =      40.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.27   FLOW VELOCITY(FEET/SEC.) =   8.35
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11114.00 =    1950.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11114.00 TO NODE  11115.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3541.57  DOWNSTREAM(FEET) =   3320.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.90   CHANNEL SLOPE =  0.1172
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.330
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.13      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.22
  AVERAGE FLOW DEPTH(FEET) =   1.66   TRAVEL TIME(MIN.) =   4.36
  Tc(MIN.) =   16.72
  SUBAREA AREA(ACRES) =    51.13       SUBAREA RUNOFF(CFS) =   38.19
  EFFECTIVE AREA(ACRES) =     88.26     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       88.3         PEAK FLOW RATE(CFS) =      65.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.72   FLOW VELOCITY(FEET/SEC.) =   7.42
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11115.00 =    3840.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11115.00 TO NODE  11116.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3320.00  DOWNSTREAM(FEET) =   3162.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.45   CHANNEL SLOPE =  0.0837
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.174
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.52      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     124.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.66
  AVERAGE FLOW DEPTH(FEET) =   2.33   TRAVEL TIME(MIN.) =   4.10
```

```
  Tc(MIN.) =   20.82
  SUBAREA AREA(ACRES) =   193.52       SUBAREA RUNOFF(CFS) =  117.42
  EFFECTIVE AREA(ACRES) =    281.78     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.8         PEAK FLOW RATE(CFS) =     170.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.62   FLOW VELOCITY(FEET/SEC.) =   8.29
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11116.00 =    5724.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11116.00 TO NODE  11117.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3162.36  DOWNSTREAM(FEET) =   3062.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.90   CHANNEL SLOPE =  0.0524
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.034
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.47      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     198.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.21
  AVERAGE FLOW DEPTH(FEET) =   3.03   TRAVEL TIME(MIN.) =   4.40
  Tc(MIN.) =   25.22
  SUBAREA AREA(ACRES) =   112.47       SUBAREA RUNOFF(CFS) =   54.00
  EFFECTIVE AREA(ACRES) =    394.25     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      394.2         PEAK FLOW RATE(CFS) =     189.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.97   FLOW VELOCITY(FEET/SEC.) =   7.14
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11117.00 =    7628.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1878.40   CHANNEL SLOPE =  0.0587
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.935
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.63      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     199.40
```



```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.53
  AVERAGE FLOW DEPTH(FEET) =   2.97   TRAVEL TIME(MIN.) =   4.16
  Tc(MIN.) =   29.38
  SUBAREA AREA(ACRES) =    51.63       SUBAREA RUNOFF(CFS) =   20.19
  EFFECTIVE AREA(ACRES) =    445.88     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      445.9         PEAK FLOW RATE(CFS) =     189.29
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.91   FLOW VELOCITY(FEET/SEC.) =   7.44
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.38
  RAINFALL INTENSITY(INCH/HR) =   0.93
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     445.88
  TOTAL STREAM AREA(ACRES) =     445.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     189.29

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      205.48   29.82    0.924  0.50( 0.50) 1.00     538.3   11101.00
      2      189.29   29.38    0.935  0.50( 0.50) 1.00     445.9   11111.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      394.77   29.38    0.935  0.50( 0.50) 1.00     976.3   11111.00
      2      390.22   29.82    0.924  0.50( 0.50) 1.00     984.2   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     394.77    Tc(MIN.) =    29.38
  EFFECTIVE AREA(ACRES) =     976.29   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      984.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11121.00 TO NODE  11122.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2952.48  DOWNSTREAM(FEET) =   2639.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2687.92   CHANNEL SLOPE =  0.1165
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.881
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      170.98      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     424.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.76
  AVERAGE FLOW DEPTH(FEET) =   3.47   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   33.19
  SUBAREA AREA(ACRES) =   170.98       SUBAREA RUNOFF(CFS) =   58.61
  EFFECTIVE AREA(ACRES) =   1147.27     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1155.2         PEAK FLOW RATE(CFS) =     394.77
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.38   FLOW VELOCITY(FEET/SEC.) =  11.55
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11122.00 =   12194.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2639.37  DOWNSTREAM(FEET) =   1954.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3696.53   CHANNEL SLOPE =  0.1854
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.827
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      114.61      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     411.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.91
  AVERAGE FLOW DEPTH(FEET) =   3.14   TRAVEL TIME(MIN.) =   4.43
  Tc(MIN.) =   37.62
  SUBAREA AREA(ACRES) =   114.61       SUBAREA RUNOFF(CFS) =   33.72
  EFFECTIVE AREA(ACRES) =   1261.88     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1269.8         PEAK FLOW RATE(CFS) =     394.77
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.09   FLOW VELOCITY(FEET/SEC.) =  13.76
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =   1
```



```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   37.62
  RAINFALL INTENSITY(INCH/HR) =   0.83
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1261.88
  TOTAL STREAM AREA(ACRES) =    1269.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     394.77

****************************************************************************
  FLOW PROCESS FROM NODE  11130.00 TO NODE  11131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   259.85
  ELEVATION DATA: UPSTREAM(FEET) =   3923.93  DOWNSTREAM(FEET) =   3765.35

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.204
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.593
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.27      0.50     1.000     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.39
  TOTAL AREA(ACRES) =      1.27   PEAK FLOW RATE(CFS) =      2.39

****************************************************************************
  FLOW PROCESS FROM NODE  11131.00 TO NODE  11132.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3765.35  DOWNSTREAM(FEET) =   3414.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   674.05   CHANNEL SLOPE =  0.5200
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.271
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.52      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.48
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   1.50
  Tc(MIN.) =    8.71
  SUBAREA AREA(ACRES) =     6.52       SUBAREA RUNOFF(CFS) =   10.39
```

```
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      12.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   8.52
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11132.00 =     933.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11132.00 TO NODE  11133.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3414.86  DOWNSTREAM(FEET) =   2699.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1813.44   CHANNEL SLOPE =  0.3945
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.792
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.63      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.12
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   11.69
  SUBAREA AREA(ACRES) =    41.63       SUBAREA RUNOFF(CFS) =   48.41
  EFFECTIVE AREA(ACRES) =     49.42     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       49.4         PEAK FLOW RATE(CFS) =      57.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =  11.30
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11133.00 =    2747.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11133.00 TO NODE  11134.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2699.51  DOWNSTREAM(FEET) =   2464.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1053.33   CHANNEL SLOPE =  0.2235
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.604
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      142.85      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     128.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.13
  AVERAGE FLOW DEPTH(FEET) =   1.96   TRAVEL TIME(MIN.) =   1.58
```



```
  Tc(MIN.) =   13.27
  SUBAREA AREA(ACRES) =   142.85       SUBAREA RUNOFF(CFS) =  141.92
  EFFECTIVE AREA(ACRES) =    192.27     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      192.3         PEAK FLOW RATE(CFS) =     191.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.28   FLOW VELOCITY(FEET/SEC.) =  12.29
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11134.00 =    3800.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.06  DOWNSTREAM(FEET) =   1954.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1291.98   CHANNEL SLOPE =  0.3946
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.438
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.58      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     201.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.43
  AVERAGE FLOW DEPTH(FEET) =   2.09   TRAVEL TIME(MIN.) =   1.40
  Tc(MIN.) =   14.67
  SUBAREA AREA(ACRES) =    24.58       SUBAREA RUNOFF(CFS) =   20.74
  EFFECTIVE AREA(ACRES) =    216.85     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      216.9         PEAK FLOW RATE(CFS) =     191.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.04   FLOW VELOCITY(FEET/SEC.) =  15.27
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11141.00 =    5092.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.67
  RAINFALL INTENSITY(INCH/HR) =   1.44
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     216.85
  TOTAL STREAM AREA(ACRES) =     216.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     191.02
```

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	394.77	37.62	0.827	0.50(0.50)	1.00	1261.9	11111.00
1	390.30	38.08	0.821	0.50(0.50)	1.00	1269.8	11101.00
2	191.02	14.67	1.438	0.50(0.50)	1.00	216.9	11130.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	585.79	14.67	1.438	0.50(0.50)	1.00	708.8	11130.00
2	461.37	37.62	0.827	0.50(0.50)	1.00	1478.7	11111.00
3	455.75	38.08	0.821	0.50(0.50)	1.00	1486.7	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 585.79 Tc(MIN.) = 14.67
EFFECTIVE AREA(ACRES) = 708.84 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1486.7
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11141.00 = 15891.01 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 1486.7 TC(MIN.) = 14.67
EFFECTIVE AREA(ACRES) = 708.84 AREA-AVERAGED Fm(INCH/HR)= 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS) = 585.79

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	585.79	14.67	1.438	0.50(0.50)	1.00	708.8	11130.00
2	461.37	37.62	0.827	0.50(0.50)	1.00	1478.7	11111.00
3	455.75	38.08	0.821	0.50(0.50)	1.00	1486.7	11101.00

==========
==========

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S12.DAT
  TIME/DATE OF STUDY: 10:30 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.065
   2)   10.00;  1.994
   3)   15.00;  1.398
   4)   20.00;  1.201
   5)   25.00;  1.039
   6)   30.00;  0.920
   7)   40.00;  0.798
   8)   50.00;  0.714
   9)   60.00;  0.656
  10)   90.00;  0.556
  11)  120.00;  0.503
  12)  180.00;  0.428
  13)  360.00;  0.327
  14) 1440.00;  0.147
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11220.00 TO NODE  11221.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   762.39
  ELEVATION DATA: UPSTREAM(FEET) =   3797.72  DOWNSTREAM(FEET) =   3296.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.919
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.885
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.02      0.50     1.000     0   10.92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.25
  TOTAL AREA(ACRES) =      5.02   PEAK FLOW RATE(CFS) =      6.25

**************************************************************************
  FLOW PROCESS FROM NODE  11221.00 TO NODE  11223.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3296.86  DOWNSTREAM(FEET) =   2738.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   912.82   CHANNEL SLOPE =  0.6112
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.708
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.44      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.27
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   1.48
  Tc(MIN.) =   12.40
  SUBAREA AREA(ACRES) =    26.44       SUBAREA RUNOFF(CFS) =   28.74
  EFFECTIVE AREA(ACRES) =     31.46     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.5         PEAK FLOW RATE(CFS) =      34.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =  11.70
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11223.00 =    1675.21 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11223.00 TO NODE  11224.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2738.96  DOWNSTREAM(FEET) =   2370.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.79   CHANNEL SLOPE =  0.3843
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.548
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.44      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      73.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.90
  AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   1.34
  Tc(MIN.) =   13.74
  SUBAREA AREA(ACRES) =    82.44       SUBAREA RUNOFF(CFS) =   77.71
  EFFECTIVE AREA(ACRES) =    113.90     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.9         PEAK FLOW RATE(CFS) =     107.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.65   FLOW VELOCITY(FEET/SEC.) =  13.10
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11224.00 =    2635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2370.12  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.40   CHANNEL SLOPE =  0.2591
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.324
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     130.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.81
  AVERAGE FLOW DEPTH(FEET) =   1.92   TRAVEL TIME(MIN.) =   3.14
  Tc(MIN.) =   16.88
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =   45.91
  EFFECTIVE AREA(ACRES) =    175.83     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      175.8         PEAK FLOW RATE(CFS) =     130.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.92   FLOW VELOCITY(FEET/SEC.) =  11.81
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```



```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S11.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      585.79   14.67  0.50( 0.50) 1.00     708.8   11130.00
      2      461.37   37.62  0.50( 0.50) 1.00    1478.7   11111.00
      3      455.75   38.08  0.50( 0.50) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =     1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      585.79   14.67  0.50( 0.50) 1.00     708.8   11130.00
      2      461.37   37.62  0.50( 0.50) 1.00    1478.7   11111.00
      3      455.75   38.08  0.50( 0.50) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =      1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11231.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1954.20  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1435.64   CHANNEL SLOPE =  0.1116
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.337
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       89.78      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     619.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.75
  AVERAGE FLOW DEPTH(FEET) =   4.03   TRAVEL TIME(MIN.) =   1.88
  Tc(MIN.) =   16.54
  SUBAREA AREA(ACRES) =    89.78       SUBAREA RUNOFF(CFS) =   67.63
  EFFECTIVE AREA(ACRES) =    798.62     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1576.4         PEAK FLOW RATE(CFS) =     601.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.99   FLOW VELOCITY(FEET/SEC.) =  12.63
```

```
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      601.59   16.54    1.337  0.50( 0.50) 1.00     798.6   11130.00
      2      461.37   39.63    0.803  0.50( 0.50) 1.00    1568.5   11111.00
      3      455.75   40.09    0.797  0.50( 0.50) 1.00    1576.4   11101.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      130.34   16.88    1.324  0.50( 0.50) 1.00     175.8   11220.00
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      731.39   16.54    1.337  0.50( 0.50) 1.00     970.9   11130.00
      2      729.88   16.88    1.324  0.50( 0.50) 1.00     985.7   11220.00
      3      509.21   39.63    0.803  0.50( 0.50) 1.00    1744.3   11111.00
      4      502.75   40.09    0.797  0.50( 0.50) 1.00    1752.3   11101.00
    TOTAL AREA(ACRES) =      1752.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      731.39  Tc(MIN.) =   16.544
  EFFECTIVE AREA(ACRES) =    970.93  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1752.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.01  DOWNSTREAM(FEET) =   1680.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.84   CHANNEL SLOPE =  0.0585
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.216
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.78      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     750.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.48
  AVERAGE FLOW DEPTH(FEET) =   4.89   TRAVEL TIME(MIN.) =   3.07
```



```
  Tc(MIN.) =   19.62
  SUBAREA AREA(ACRES) =    59.78       SUBAREA RUNOFF(CFS) =   38.51
  EFFECTIVE AREA(ACRES) =   1030.71     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1812.1          PEAK FLOW RATE(CFS) =     731.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.84   FLOW VELOCITY(FEET/SEC.) =  10.41
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.62
  RAINFALL INTENSITY(INCH/HR) =   1.22
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1030.71
  TOTAL STREAM AREA(ACRES) =    1812.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     731.39

****************************************************************************
  FLOW PROCESS FROM NODE  11201.00 TO NODE  11202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   986.34
  ELEVATION DATA: UPSTREAM(FEET) =   3383.22  DOWNSTREAM(FEET) =   3248.87

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.343
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.834
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                -        8.54      0.50     1.000     0   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.25
  TOTAL AREA(ACRES) =      8.54   PEAK FLOW RATE(CFS) =     10.25

****************************************************************************
  FLOW PROCESS FROM NODE  11202.00 TO NODE  11203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3248.87  DOWNSTREAM(FEET) =   3198.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   922.69   CHANNEL SLOPE =  0.0550
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```

```
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.396
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.42      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.15
  AVERAGE FLOW DEPTH(FEET) =   1.28   TRAVEL TIME(MIN.) =   3.71
  Tc(MIN.) =   15.05
  SUBAREA AREA(ACRES) =    24.42       SUBAREA RUNOFF(CFS) =   19.69
  EFFECTIVE AREA(ACRES) =     32.96     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      26.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =   4.46
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11203.00 =    1909.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11203.00 TO NODE  11204.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3198.08  DOWNSTREAM(FEET) =   3062.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1941.08   CHANNEL SLOPE =  0.0699
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.164
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       37.67      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.30
  AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   6.10
  Tc(MIN.) =   21.15
  SUBAREA AREA(ACRES) =    37.67       SUBAREA RUNOFF(CFS) =   22.49
  EFFECTIVE AREA(ACRES) =     70.63     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =      42.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =   5.46
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11204.00 =    3850.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11204.00 TO NODE  11205.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.48  DOWNSTREAM(FEET) =   2940.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.73   CHANNEL SLOPE =  0.0636
```



```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.992
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.87      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.48
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   5.83
  Tc(MIN.) =   26.98
  SUBAREA AREA(ACRES) =    34.87       SUBAREA RUNOFF(CFS) =   15.43
  EFFECTIVE AREA(ACRES) =    105.50     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      105.5         PEAK FLOW RATE(CFS) =      46.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.70   FLOW VELOCITY(FEET/SEC.) =   5.41
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11205.00 =    5766.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11205.00 TO NODE  11206.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2940.56  DOWNSTREAM(FEET) =   2581.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2865.58   CHANNEL SLOPE =  0.1252
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.877
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.17      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.28
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   6.56
  Tc(MIN.) =   33.54
  SUBAREA AREA(ACRES) =    56.17       SUBAREA RUNOFF(CFS) =   19.04
  EFFECTIVE AREA(ACRES) =    161.67     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      161.7         PEAK FLOW RATE(CFS) =      54.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.59   FLOW VELOCITY(FEET/SEC.) =   7.23
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11206.00 =    8632.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11206.00 TO NODE  11207.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   2581.93  DOWNSTREAM(FEET) =   2317.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1985.44   CHANNEL SLOPE =  0.1333
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.834
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      546.87      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     137.04
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.36
 AVERAGE FLOW DEPTH(FEET) =   2.21   TRAVEL TIME(MIN.) =   3.54
 Tc(MIN.) =   37.08
 SUBAREA AREA(ACRES) =   546.87       SUBAREA RUNOFF(CFS) =  164.10
 EFFECTIVE AREA(ACRES) =    708.54     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      708.5         PEAK FLOW RATE(CFS) =     212.61

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.61   FLOW VELOCITY(FEET/SEC.) =  10.43
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11207.00 =   10617.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2317.20  DOWNSTREAM(FEET) =   1680.94
 CHANNEL LENGTH THRU SUBAREA(FEET) =  4085.95   CHANNEL SLOPE =  0.1557
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.773
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      389.75      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     260.60
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.62
 AVERAGE FLOW DEPTH(FEET) =   2.73   TRAVEL TIME(MIN.) =   5.86
 Tc(MIN.) =   42.94
 SUBAREA AREA(ACRES) =   389.75       SUBAREA RUNOFF(CFS) =   95.79
 EFFECTIVE AREA(ACRES) =   1098.29     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1098.3         PEAK FLOW RATE(CFS) =     269.93

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.77   FLOW VELOCITY(FEET/SEC.) =  11.71
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11241.00 =   14703.81 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   42.94
 RAINFALL INTENSITY(INCH/HR) =   0.77
 AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    1098.29
 TOTAL STREAM AREA(ACRES) =    1098.29
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     269.93

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1      731.39   19.62    1.216  0.50( 0.50) 1.00    1030.7   11130.00
     1      729.88   19.96    1.203  0.50( 0.50) 1.00    1045.5   11220.00
     1      509.21   43.00    0.773  0.50( 0.50) 1.00    1804.1   11111.00
     1      502.75   43.48    0.769  0.50( 0.50) 1.00    1812.1   11101.00
     2      269.93   42.94    0.773  0.50( 0.50) 1.00    1098.3   11201.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1     1001.32   19.62    1.216  0.50( 0.50) 1.00    1532.5   11130.00
     2      999.81   19.96    1.203  0.50( 0.50) 1.00    1555.9   11220.00
     3      779.74   42.94    0.773  0.50( 0.50) 1.00    2900.4   11201.00
     4      778.63   43.00    0.773  0.50( 0.50) 1.00    2902.4   11111.00
     5      768.24   43.48    0.769  0.50( 0.50) 1.00    2910.3   11101.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1001.32    Tc(MIN.) =    19.62
 EFFECTIVE AREA(ACRES) =    1532.48   AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     2910.3
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11241.00 TO NODE  11242.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1680.94  DOWNSTREAM(FEET) =   1521.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1795.61   CHANNEL SLOPE =  0.0890
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.141
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      198.62      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1058.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.37
  AVERAGE FLOW DEPTH(FEET) =   5.14   TRAVEL TIME(MIN.) =   2.24
  Tc(MIN.) =   21.86
  SUBAREA AREA(ACRES) =   198.62       SUBAREA RUNOFF(CFS) =  114.52
  EFFECTIVE AREA(ACRES) =   1731.10     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3109.0         PEAK FLOW RATE(CFS) =    1001.32
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.03   FLOW VELOCITY(FEET/SEC.) =  13.19
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11242.00 =   21056.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1521.21  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.33   CHANNEL SLOPE =  0.0797
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.047
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       95.39      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1024.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.74
  AVERAGE FLOW DEPTH(FEET) =   5.18   TRAVEL TIME(MIN.) =   2.91
  Tc(MIN.) =   24.76
  SUBAREA AREA(ACRES) =    95.39       SUBAREA RUNOFF(CFS) =   46.91
  EFFECTIVE AREA(ACRES) =   1826.49     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3204.3         PEAK FLOW RATE(CFS) =    1001.32
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.14   FLOW VELOCITY(FEET/SEC.) =  12.65
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.76
  RAINFALL INTENSITY(INCH/HR) =   1.05
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1826.49
```



```
  TOTAL STREAM AREA(ACRES) =    3204.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1001.32

****************************************************************************
  FLOW PROCESS FROM NODE  11250.00 TO NODE  11251.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   982.50
  ELEVATION DATA: UPSTREAM(FEET) =   3806.44  DOWNSTREAM(FEET) =   3168.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.112
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.742
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.91      0.50     1.000     0   12.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.61
  TOTAL AREA(ACRES) =      5.91   PEAK FLOW RATE(CFS) =      6.61

****************************************************************************
  FLOW PROCESS FROM NODE  11251.00 TO NODE  11252.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3168.25  DOWNSTREAM(FEET) =   2683.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.5240
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.530
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.73      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.67
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   1.78
  Tc(MIN.) =   13.89
  SUBAREA AREA(ACRES) =    13.73       SUBAREA RUNOFF(CFS) =   12.73
  EFFECTIVE AREA(ACRES) =     19.64     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       19.6         PEAK FLOW RATE(CFS) =      18.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   9.39
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11252.00 =    1908.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11252.00 TO NODE  11253.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2683.24  DOWNSTREAM(FEET) =   2334.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.66   CHANNEL SLOPE =  0.3694
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.380
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       55.67      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.07
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   1.56
  Tc(MIN.) =   15.46
  SUBAREA AREA(ACRES) =    55.67       SUBAREA RUNOFF(CFS) =   44.08
  EFFECTIVE AREA(ACRES) =     75.31     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       75.3         PEAK FLOW RATE(CFS) =      59.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.34   FLOW VELOCITY(FEET/SEC.) =  11.10
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11253.00 =    2852.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11253.00 TO NODE  11254.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2334.26  DOWNSTREAM(FEET) =   1768.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2293.59   CHANNEL SLOPE =  0.2468
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.246
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.43      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     115.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.25
  AVERAGE FLOW DEPTH(FEET) =   1.85   TRAVEL TIME(MIN.) =   3.40
  Tc(MIN.) =   18.85
  SUBAREA AREA(ACRES) =   165.43       SUBAREA RUNOFF(CFS) =  111.06
  EFFECTIVE AREA(ACRES) =    240.74     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      240.7         PEAK FLOW RATE(CFS) =     161.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.10   FLOW VELOCITY(FEET/SEC.) =  12.27
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11254.00 =    5146.37 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  11254.00 TO NODE  11255.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1768.11  DOWNSTREAM(FEET) =   1506.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.59   CHANNEL SLOPE =  0.1376
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.142
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.55      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     217.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.63
  AVERAGE FLOW DEPTH(FEET) =   2.61   TRAVEL TIME(MIN.) =   2.98
  Tc(MIN.) =   21.83
  SUBAREA AREA(ACRES) =   194.55       SUBAREA RUNOFF(CFS) =  112.33
  EFFECTIVE AREA(ACRES) =    435.29     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      435.3         PEAK FLOW RATE(CFS) =     251.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.76   FLOW VELOCITY(FEET/SEC.) =  11.01
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11255.00 =    7043.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.97  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =   882.10   CHANNEL SLOPE =  0.1848
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.104
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      137.86      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     288.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.72
  AVERAGE FLOW DEPTH(FEET) =   2.75   TRAVEL TIME(MIN.) =   1.16
  Tc(MIN.) =   22.99
  SUBAREA AREA(ACRES) =   137.86       SUBAREA RUNOFF(CFS) =   74.95
  EFFECTIVE AREA(ACRES) =    573.15     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      573.1         PEAK FLOW RATE(CFS) =     311.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.83   FLOW VELOCITY(FEET/SEC.) =  12.94
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11261.00 =    7926.06 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.99
  RAINFALL INTENSITY(INCH/HR) =   1.10
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     573.15
  TOTAL STREAM AREA(ACRES) =     573.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     311.60

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1001.32   24.76    1.047  0.50( 0.50) 1.00    1826.5   11130.00
      1      999.81   25.11    1.036  0.50( 0.50) 1.00    1849.9   11220.00
      1      779.74   48.44    0.727  0.50( 0.50) 1.00    3194.4   11201.00
      1      778.63   48.51    0.727  0.50( 0.50) 1.00    3196.4   11111.00
      1      768.24   49.00    0.722  0.50( 0.50) 1.00    3204.3   11101.00
      2      311.60   22.99    1.104  0.50( 0.50) 1.00     573.1   11250.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1312.92   22.99    1.104  0.50( 0.50) 1.00    2268.4   11250.00
      2     1283.18   24.76    1.047  0.50( 0.50) 1.00    2399.6   11130.00
      3     1276.43   25.11    1.036  0.50( 0.50) 1.00    2423.1   11220.00
      4      896.76   48.44    0.727  0.50( 0.50) 1.00    3767.5   11201.00
      5      895.37   48.51    0.727  0.50( 0.50) 1.00    3769.6   11111.00
      6      882.85   49.00    0.722  0.50( 0.50) 1.00    3777.5   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1312.92    Tc(MIN.) =    22.99
  EFFECTIVE AREA(ACRES) =    2268.42   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3777.5
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1343.95  DOWNSTREAM(FEET) =   1299.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =   889.38   CHANNEL SLOPE =  0.0503
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```



```
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.062
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.65      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1333.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.45
  AVERAGE FLOW DEPTH(FEET) =   6.23   TRAVEL TIME(MIN.) =   1.29
  Tc(MIN.) =   24.28
  SUBAREA AREA(ACRES) =    79.65       SUBAREA RUNOFF(CFS) =   40.29
  EFFECTIVE AREA(ACRES) =   2348.07     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3857.1          PEAK FLOW RATE(CFS) =    1312.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.20   FLOW VELOCITY(FEET/SEC.) =  11.39
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11310.00 =   24168.81 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3857.1  TC(MIN.) =     24.28
  EFFECTIVE AREA(ACRES) =   2348.07  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1312.92

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1312.92   24.28    1.062  0.50( 0.50) 1.00    2348.1   11250.00
      2     1283.18   26.07    1.014  0.50( 0.50) 1.00    2479.3   11130.00
      3     1276.43   26.41    1.005  0.50( 0.50) 1.00    2502.7   11220.00
      4      896.76   49.87    0.715  0.50( 0.50) 1.00    3847.2   11201.00
      5      895.37   49.94    0.715  0.50( 0.50) 1.00    3849.2   11111.00
      6      882.85   50.43    0.711  0.50( 0.50) 1.00    3857.1   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S13.DAT
  TIME/DATE OF STUDY: 10:30 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.065
   2)   10.00;  1.994
   3)   15.00;  1.398
   4)   20.00;  1.201
   5)   25.00;  1.039
   6)   30.00;  0.920
   7)   40.00;  0.798
   8)   50.00;  0.714
   9)   60.00;  0.656
  10)   90.00;  0.556
  11)  120.00;  0.503
  12)  180.00;  0.428
  13)  360.00;  0.327
  14) 1440.00;  0.147
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11300.00 TO NODE  11301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   455.90
  ELEVATION DATA: UPSTREAM(FEET) =   3394.67  DOWNSTREAM(FEET) =   3247.06

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.240
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.965
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.53      0.50     1.000     0   10.24
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.34
  TOTAL AREA(ACRES) =      2.53   PEAK FLOW RATE(CFS) =      3.34

**************************************************************************
  FLOW PROCESS FROM NODE  11301.00 TO NODE  11301.50 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3247.06  DOWNSTREAM(FEET) =   3150.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   468.69   CHANNEL SLOPE =  0.2059
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.801
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.95      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.66
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   1.38
  Tc(MIN.) =   11.62
  SUBAREA AREA(ACRES) =    10.95       SUBAREA RUNOFF(CFS) =   12.82
  EFFECTIVE AREA(ACRES) =     13.48     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.5         PEAK FLOW RATE(CFS) =      15.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   6.42
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11301.50 =     924.59 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11301.50 TO NODE  11302.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   3150.57  DOWNSTREAM(FEET) =   2840.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =   982.20   CHANNEL SLOPE =  0.3162
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.557
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.59      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.01
  AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =   2.04
  Tc(MIN.) =   13.66
  SUBAREA AREA(ACRES) =     9.59       SUBAREA RUNOFF(CFS) =    9.12
  EFFECTIVE AREA(ACRES) =     23.07     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.1         PEAK FLOW RATE(CFS) =      21.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   8.13
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11302.00 =    1906.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11302.00 TO NODE  11303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2840.04  DOWNSTREAM(FEET) =   2177.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.03   CHANNEL SLOPE =  0.3460
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.331
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.31      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.55
  AVERAGE FLOW DEPTH(FEET) =   1.30   TRAVEL TIME(MIN.) =   3.03
  Tc(MIN.) =   16.69
  SUBAREA AREA(ACRES) =    84.31       SUBAREA RUNOFF(CFS) =   63.07
  EFFECTIVE AREA(ACRES) =    107.38     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.4         PEAK FLOW RATE(CFS) =      80.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =  11.69
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11303.00 =    3822.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11303.00 TO NODE  11304.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2177.16  DOWNSTREAM(FEET) =   1612.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2472.34   CHANNEL SLOPE =  0.2285
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.185
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       99.61      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     111.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.83
  AVERAGE FLOW DEPTH(FEET) =   1.85   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   20.49
  SUBAREA AREA(ACRES) =    99.61       SUBAREA RUNOFF(CFS) =   61.39
  EFFECTIVE AREA(ACRES) =    206.99     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.0         PEAK FLOW RATE(CFS) =     127.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.95   FLOW VELOCITY(FEET/SEC.) =  11.20
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11304.00 =    6295.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1612.27  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2432.96   CHANNEL SLOPE =  0.1604
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.054
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.86      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     141.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.06
  AVERAGE FLOW DEPTH(FEET) =   2.16   TRAVEL TIME(MIN.) =   4.03
  Tc(MIN.) =   24.53
  SUBAREA AREA(ACRES) =    53.86       SUBAREA RUNOFF(CFS) =   26.86
  EFFECTIVE AREA(ACRES) =    260.85     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      260.8         PEAK FLOW RATE(CFS) =     130.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.10   FLOW VELOCITY(FEET/SEC.) =   9.88
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  10
```

```
------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 15.1
------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S12.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1312.92   24.28  0.50( 0.50) 1.00    2348.1   11250.00
      2     1283.18   26.07  0.50( 0.50) 1.00    2479.3   11130.00
      3     1276.43   26.41  0.50( 0.50) 1.00    2502.7   11220.00
      4      896.76   49.87  0.50( 0.50) 1.00    3847.2   11201.00
      5      895.37   49.94  0.50( 0.50) 1.00    3849.2   11111.00
      6      882.85   50.43  0.50( 0.50) 1.00    3857.1   11101.00
    TOTAL AREA(ACRES) =     3857.1

******************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 14.0
------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1312.92   24.28  0.50( 0.50) 1.00    2348.1   11250.00
      2     1283.18   26.07  0.50( 0.50) 1.00    2479.3   11130.00
      3     1276.43   26.41  0.50( 0.50) 1.00    2502.7   11220.00
      4      896.76   49.87  0.50( 0.50) 1.00    3847.2   11201.00
      5      895.37   49.94  0.50( 0.50) 1.00    3849.2   11111.00
      6      882.85   50.43  0.50( 0.50) 1.00    3857.1   11101.00
    TOTAL AREA(ACRES) =      3857.1

******************************************************************************
  FLOW PROCESS FROM NODE  11310.00 TO NODE  11320.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1299.17  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1694.05   CHANNEL SLOPE =  0.0455
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.995
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.22      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1331.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.02
  AVERAGE FLOW DEPTH(FEET) =   6.34   TRAVEL TIME(MIN.) =   2.56
```



```
  Tc(MIN.) =   26.84
  SUBAREA AREA(ACRES) =    83.22       SUBAREA RUNOFF(CFS) =   37.07
  EFFECTIVE AREA(ACRES) =   2431.29     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3940.4          PEAK FLOW RATE(CFS) =    1312.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.31   FLOW VELOCITY(FEET/SEC.) =  10.98
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  11
------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1312.92   26.84    0.995  0.50( 0.50) 1.00    2431.3   11250.00
      2     1283.18   28.65    0.952  0.50( 0.50) 1.00    2562.5   11130.00
      3     1276.43   28.99    0.944  0.50( 0.50) 1.00    2585.9   11220.00
      4      896.76   52.70    0.698  0.50( 0.50) 1.00    3930.4   11201.00
      5      895.37   52.76    0.698  0.50( 0.50) 1.00    3932.4   11111.00
      6      882.85   53.27    0.695  0.50( 0.50) 1.00    3940.4   11101.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      130.10   24.53    1.054  0.50( 0.50) 1.00     260.8   11300.00
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1443.01   24.53    1.054  0.50( 0.50) 1.00    2482.4   11300.00
      2     1429.12   26.84    0.995  0.50( 0.50) 1.00    2692.1   11250.00
      3     1389.30   28.65    0.952  0.50( 0.50) 1.00    2823.4   11130.00
      4     1380.62   28.99    0.944  0.50( 0.50) 1.00    2846.8   11220.00
      5      943.28   52.70    0.698  0.50( 0.50) 1.00    4191.3   11201.00
      6      941.80   52.76    0.698  0.50( 0.50) 1.00    4193.3   11111.00
      7      928.59   53.27    0.695  0.50( 0.50) 1.00    4201.2   11101.00
    TOTAL AREA(ACRES) =      4201.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1443.01  Tc(MIN.) =   24.526
  EFFECTIVE AREA(ACRES) =   2482.41  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     4201.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1222.10  DOWNSTREAM(FEET) =   1092.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3157.19   CHANNEL SLOPE =  0.0410
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.936
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.55      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1507.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.93
  AVERAGE FLOW DEPTH(FEET) =   6.78   TRAVEL TIME(MIN.) =   4.81
  Tc(MIN.) =   29.34
  SUBAREA AREA(ACRES) =   328.55       SUBAREA RUNOFF(CFS) =  128.78
  EFFECTIVE AREA(ACRES) =   2810.96     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4529.8         PEAK FLOW RATE(CFS) =    1443.01
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.67   FLOW VELOCITY(FEET/SEC.) =  10.81
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.34
  RAINFALL INTENSITY(INCH/HR) =   0.94
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2810.96
  TOTAL STREAM AREA(ACRES) =    4529.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1443.01

****************************************************************************
  FLOW PROCESS FROM NODE  11330.00 TO NODE  11331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.83
  ELEVATION DATA: UPSTREAM(FEET) =   3270.16  DOWNSTREAM(FEET) =   3123.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.975
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.428
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
```



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  "CHAPARRAL,NARROWLEAF"     -        1.69      0.50     1.000     0    7.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.93
  TOTAL AREA(ACRES) =      1.69   PEAK FLOW RATE(CFS) =      2.93

****************************************************************************
  FLOW PROCESS FROM NODE  11331.00 TO NODE  11332.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3123.64  DOWNSTREAM(FEET) =   2903.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   710.41   CHANNEL SLOPE =  0.3104
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.012
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.82      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   1.94
  Tc(MIN.) =    9.92
  SUBAREA AREA(ACRES) =     5.82       SUBAREA RUNOFF(CFS) =    7.92
  EFFECTIVE AREA(ACRES) =      7.51     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.5         PEAK FLOW RATE(CFS) =      10.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   6.71
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11332.00 =    1010.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11332.00 TO NODE  11333.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.10  DOWNSTREAM(FEET) =   2718.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   843.93   CHANNEL SLOPE =  0.2183
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.746
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.66      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.51
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   12.08
  SUBAREA AREA(ACRES) =     9.66       SUBAREA RUNOFF(CFS) =   10.83
```

```
  EFFECTIVE AREA(ACRES) =     17.17     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.2         PEAK FLOW RATE(CFS) =      19.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   6.88
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11333.00 =    1854.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11333.00 TO NODE  11334.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2718.89  DOWNSTREAM(FEET) =   2364.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1084.60   CHANNEL SLOPE =  0.3264
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.493
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.67      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.50
  AVERAGE FLOW DEPTH(FEET) =   0.98   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =   14.20
  SUBAREA AREA(ACRES) =    11.67       SUBAREA RUNOFF(CFS) =   10.43
  EFFECTIVE AREA(ACRES) =     28.84     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.8         PEAK FLOW RATE(CFS) =      25.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   8.65
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11334.00 =    2938.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11334.00 TO NODE  11335.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2364.84  DOWNSTREAM(FEET) =   1729.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.08   CHANNEL SLOPE =  0.3237
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.309
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      102.74      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.76
  AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   3.04
```



```
  Tc(MIN.) =   17.25
  SUBAREA AREA(ACRES) =   102.74       SUBAREA RUNOFF(CFS) =   74.83
  EFFECTIVE AREA(ACRES) =    131.58     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      131.6         PEAK FLOW RATE(CFS) =      95.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.64   FLOW VELOCITY(FEET/SEC.) =  11.91
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11335.00 =    4901.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1729.46  DOWNSTREAM(FEET) =   1092.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2702.07   CHANNEL SLOPE =  0.2357
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.161
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.38      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     122.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.28
  AVERAGE FLOW DEPTH(FEET) =   1.90   TRAVEL TIME(MIN.) =   3.99
  Tc(MIN.) =   21.24
  SUBAREA AREA(ACRES) =    90.38       SUBAREA RUNOFF(CFS) =   53.74
  EFFECTIVE AREA(ACRES) =    221.96     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      222.0         PEAK FLOW RATE(CFS) =     131.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =  11.48
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11340.00 =    7603.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.24
  RAINFALL INTENSITY(INCH/HR) =   1.16
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     221.96
  TOTAL STREAM AREA(ACRES) =     221.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     131.98

  ** CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1443.01	29.34	0.936	0.50(0.50)	1.00	2811.0	11300.00
1	1429.12	31.67	0.900	0.50(0.50)	1.00	3020.7	11250.00
1	1389.30	33.51	0.877	0.50(0.50)	1.00	3151.9	11130.00
1	1380.62	33.86	0.873	0.50(0.50)	1.00	3175.3	11220.00
1	943.28	58.07	0.667	0.50(0.50)	1.00	4519.8	11201.00
1	941.80	58.15	0.667	0.50(0.50)	1.00	4521.8	11111.00
1	928.59	58.67	0.664	0.50(0.50)	1.00	4529.8	11101.00
2	131.98	21.24	1.161	0.50(0.50)	1.00	222.0	11330.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1574.99	21.24	1.161	0.50(0.50)	1.00	2256.8	11330.00
2	1530.02	29.34	0.936	0.50(0.50)	1.00	3032.9	11300.00
3	1508.91	31.67	0.900	0.50(0.50)	1.00	3242.6	11250.00
4	1464.61	33.51	0.877	0.50(0.50)	1.00	3373.9	11130.00
5	1455.07	33.86	0.873	0.50(0.50)	1.00	3397.3	11220.00
6	976.63	58.07	0.667	0.50(0.50)	1.00	4741.8	11201.00
7	975.08	58.15	0.667	0.50(0.50)	1.00	4743.8	11111.00
8	961.25	58.67	0.664	0.50(0.50)	1.00	4751.7	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1574.99 Tc(MIN.) = 21.24
EFFECTIVE AREA(ACRES) = 2256.80 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4751.7
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11340.00 = 29020.05 FEET.

****
FLOW PROCESS FROM NODE 11340.00 TO NODE 11341.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1092.58 DOWNSTREAM(FEET) = 1055.49
CHANNEL LENGTH THRU SUBAREA(FEET) = 1432.69 CHANNEL SLOPE = 0.0259
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.078
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.55	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1589.17
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.32
AVERAGE FLOW DEPTH(FEET) = 7.54 TRAVEL TIME(MIN.) = 2.56
Tc(MIN.) = 23.80
SUBAREA AREA(ACRES) = 54.55 SUBAREA RUNOFF(CFS) = 28.36
EFFECTIVE AREA(ACRES) = 2311.35 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4806.3 PEAK FLOW RATE(CFS) = 1574.99

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.51 FLOW VELOCITY(FEET/SEC.) = 9.30
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11341.00 = 30452.74 FEET.

****
FLOW PROCESS FROM NODE 11341.00 TO NODE 11342.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1055.49 DOWNSTREAM(FEET) = 1017.16
CHANNEL LENGTH THRU SUBAREA(FEET) = 943.89 CHANNEL SLOPE = 0.0406
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.034
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	119.96	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1603.79
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.06
AVERAGE FLOW DEPTH(FEET) = 6.95 TRAVEL TIME(MIN.) = 1.42
Tc(MIN.) = 25.22
SUBAREA AREA(ACRES) = 119.96 SUBAREA RUNOFF(CFS) = 57.59
EFFECTIVE AREA(ACRES) = 2431.31 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4926.2 PEAK FLOW RATE(CFS) = 1574.99
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.91 FLOW VELOCITY(FEET/SEC.) = 11.00
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11342.00 = 31396.63 FEET.

****
FLOW PROCESS FROM NODE 11342.00 TO NODE 11360.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1017.16 DOWNSTREAM(FEET) = 957.53
CHANNEL LENGTH THRU SUBAREA(FEET) = 1557.63 CHANNEL SLOPE = 0.0383
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.976
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	85.25	0.50	0.990	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.990
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1593.46
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.80
AVERAGE FLOW DEPTH(FEET) = 7.01 TRAVEL TIME(MIN.) = 2.40
Tc(MIN.) = 27.63

```
  SUBAREA AREA(ACRES) =    85.25       SUBAREA RUNOFF(CFS) =   36.92
  EFFECTIVE AREA(ACRES) =   2516.56     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5011.5         PEAK FLOW RATE(CFS) =    1574.99
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.98   FLOW VELOCITY(FEET/SEC.) =  10.76
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.63
  RAINFALL INTENSITY(INCH/HR) =   0.98
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2516.56
  TOTAL STREAM AREA(ACRES) =    5011.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1574.99

****************************************************************************
  FLOW PROCESS FROM NODE  11350.00 TO NODE  11351.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.54
  ELEVATION DATA: UPSTREAM(FEET) =   2805.98  DOWNSTREAM(FEET) =   2583.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.655
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.439
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.40      0.50     1.000     0   14.66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.56
  TOTAL AREA(ACRES) =      5.40   PEAK FLOW RATE(CFS) =      4.56

****************************************************************************
  FLOW PROCESS FROM NODE  11351.00 TO NODE  11352.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2583.16  DOWNSTREAM(FEET) =   2403.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.57   CHANNEL SLOPE =  0.1876
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```



```
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.298
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.56      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.53
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   17.54
  SUBAREA AREA(ACRES) =    15.56       SUBAREA RUNOFF(CFS) =   11.17
  EFFECTIVE AREA(ACRES) =     20.96     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.0         PEAK FLOW RATE(CFS) =      15.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   6.12
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11352.00 =    1907.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11352.00 TO NODE  11353.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2403.73  DOWNSTREAM(FEET) =   1786.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.85   CHANNEL SLOPE =  0.3190
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.169
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       74.05      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.36
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   20.98
  SUBAREA AREA(ACRES) =    74.05       SUBAREA RUNOFF(CFS) =   44.58
  EFFECTIVE AREA(ACRES) =     95.01     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       95.0         PEAK FLOW RATE(CFS) =      57.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =  10.41
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11353.00 =    3840.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11353.00 TO NODE  11354.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1786.74  DOWNSTREAM(FEET) =   1308.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2073.35   CHANNEL SLOPE =  0.2307
```

```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.052
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.22      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      67.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.60
  AVERAGE FLOW DEPTH(FEET) =   1.53   TRAVEL TIME(MIN.) =   3.60
  Tc(MIN.) =   24.58
  SUBAREA AREA(ACRES) =    41.22       SUBAREA RUNOFF(CFS) =   20.49
  EFFECTIVE AREA(ACRES) =    136.23     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      136.2         PEAK FLOW RATE(CFS) =      67.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.53   FLOW VELOCITY(FEET/SEC.) =   9.63
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11354.00 =    5914.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.39  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2455.49   CHANNEL SLOPE =  0.1429
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.941
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      201.53      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     107.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.03
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   4.53
  Tc(MIN.) =   29.12
  SUBAREA AREA(ACRES) =   201.53       SUBAREA RUNOFF(CFS) =   79.95
  EFFECTIVE AREA(ACRES) =    337.76     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      337.8         PEAK FLOW RATE(CFS) =     133.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.16   FLOW VELOCITY(FEET/SEC.) =   9.54
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11360.00 =    8369.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```



```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.12
  RAINFALL INTENSITY(INCH/HR) =   0.94
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     337.76
  TOTAL STREAM AREA(ACRES) =     337.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     133.99

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1574.99   27.63    0.976  0.50( 0.50) 1.00    2516.6   11330.00
      1     1530.02   35.78    0.849  0.50( 0.50) 1.00    3292.7   11300.00
      1     1508.91   38.13    0.821  0.50( 0.50) 1.00    3502.4   11250.00
      1     1464.61   40.02    0.798  0.50( 0.50) 1.00    3633.6   11130.00
      1     1455.07   40.39    0.795  0.50( 0.50) 1.00    3657.1   11220.00
      1      976.63   65.28    0.638  0.50( 0.50) 1.00    5001.5   11201.00
      1      975.08   65.36    0.638  0.50( 0.50) 1.00    5003.6   11111.00
      1      961.25   65.91    0.636  0.50( 0.50) 1.00    5011.5   11101.00
      2      133.99   29.12    0.941  0.50( 0.50) 1.00     337.8   11350.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1708.98   27.63    0.976  0.50( 0.50) 1.00    2837.0   11330.00
      2     1700.76   29.12    0.941  0.50( 0.50) 1.00    2996.1   11350.00
      3     1636.19   35.78    0.849  0.50( 0.50) 1.00    3630.4   11300.00
      4     1606.36   38.13    0.821  0.50( 0.50) 1.00    3840.2   11250.00
      5     1555.07   40.02    0.798  0.50( 0.50) 1.00    3971.4   11130.00
      6     1544.59   40.39    0.795  0.50( 0.50) 1.00    3994.8   11220.00
      7     1018.64   65.28    0.638  0.50( 0.50) 1.00    5339.3   11201.00
      8     1017.01   65.36    0.638  0.50( 0.50) 1.00    5341.3   11111.00
      9     1002.62   65.91    0.636  0.50( 0.50) 1.00    5349.2   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1708.98    Tc(MIN.) =    27.63
  EFFECTIVE AREA(ACRES) =    2837.05   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5349.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11360.00 TO NODE  11361.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    957.53  DOWNSTREAM(FEET) =    847.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2937.03   CHANNEL SLOPE =  0.0374
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.894
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      176.74      0.50     0.977     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1741.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.95
  AVERAGE FLOW DEPTH(FEET) =   7.28   TRAVEL TIME(MIN.) =   4.47
  Tc(MIN.) =   32.10
  SUBAREA AREA(ACRES) =   176.74       SUBAREA RUNOFF(CFS) =   64.53
  EFFECTIVE AREA(ACRES) =   3013.79     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5526.0         PEAK FLOW RATE(CFS) =    1708.98
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.23   FLOW VELOCITY(FEET/SEC.) =  10.90
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11361.00 =   35891.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11361.00 TO NODE  11362.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    847.62  DOWNSTREAM(FEET) =    738.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3869.90   CHANNEL SLOPE =  0.0283
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.815
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      429.50      0.50     0.995     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1770.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.89
  AVERAGE FLOW DEPTH(FEET) =   7.72   TRAVEL TIME(MIN.) =   6.52
  Tc(MIN.) =   38.62
  SUBAREA AREA(ACRES) =   429.50       SUBAREA RUNOFF(CFS) =  122.59
  EFFECTIVE AREA(ACRES) =   3443.29     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5955.5         PEAK FLOW RATE(CFS) =    1708.98
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.62   FLOW VELOCITY(FEET/SEC.) =   9.81
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11362.00 =   39761.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    738.28  DOWNSTREAM(FEET) =    678.93
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2987.23   CHANNEL SLOPE =  0.0199
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.761
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.97      0.50     0.991     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.991
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1724.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.61
  AVERAGE FLOW DEPTH(FEET) =   8.17   TRAVEL TIME(MIN.) =   5.78
  Tc(MIN.) =   44.40
  SUBAREA AREA(ACRES) =   125.97       SUBAREA RUNOFF(CFS) =   30.08
  EFFECTIVE AREA(ACRES) =   3569.26     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6081.5         PEAK FLOW RATE(CFS) =    1708.98
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.14   FLOW VELOCITY(FEET/SEC.) =   8.59
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11363.00 =   42748.42 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     6081.5  TC(MIN.) =     44.40
  EFFECTIVE AREA(ACRES) =   3569.26  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.998
  PEAK FLOW RATE(CFS)   =    1708.98

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     1708.98   44.40    0.761  0.50( 0.50) 1.00    3569.3   11330.00
      2     1700.76   45.91    0.748  0.50( 0.50) 1.00    3728.3   11350.00
      3     1636.19   52.75    0.698  0.50( 0.50) 1.00    4362.6   11300.00
      4     1606.36   55.19    0.684  0.50( 0.50) 1.00    4572.4   11250.00
      5     1555.07   57.22    0.672  0.50( 0.50) 1.00    4703.6   11130.00
      6     1544.59   57.62    0.670  0.50( 0.50) 1.00    4727.0   11220.00
      7     1018.64   84.42    0.575  0.50( 0.50) 1.00    6071.5   11201.00
      8     1017.01   84.51    0.574  0.50( 0.50) 1.00    6073.5   11111.00
      9     1002.62   85.12    0.572  0.50( 0.50) 1.00    6081.5   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S14.DAT
  TIME/DATE OF STUDY: 10:30 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.028
   2)   10.00;  1.974
   3)   15.00;  1.389
   4)   20.00;  1.193
   5)   25.00;  1.033
   6)   30.00;  0.916
   7)   40.00;  0.793
   8)   50.00;  0.710
   9)   60.00;  0.651
  10)   90.00;  0.551
  11)  120.00;  0.497
  12)  180.00;  0.423
  13)  360.00;  0.322
  14) 1440.00;  0.144
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11401.00 TO NODE  11401.50 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   313.41
  ELEVATION DATA: UPSTREAM(FEET) =   3384.11  DOWNSTREAM(FEET) =   3232.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.137
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.367
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.25      0.50     1.000     0    8.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.78
  TOTAL AREA(ACRES) =      2.25   PEAK FLOW RATE(CFS) =      3.78

************************************************************************
  FLOW PROCESS FROM NODE  11401.50 TO NODE  11402.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3232.76  DOWNSTREAM(FEET) =   3001.05
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.75   CHANNEL SLOPE =  0.3733
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.074
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.39      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.45
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   1.39
  Tc(MIN.) =    9.53
  SUBAREA AREA(ACRES) =    11.39       SUBAREA RUNOFF(CFS) =   16.13
  EFFECTIVE AREA(ACRES) =     13.64     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.6         PEAK FLOW RATE(CFS) =      19.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   8.42
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11402.00 =     934.16 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11402.00 TO NODE  11403.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   3001.05  DOWNSTREAM(FEET) =   2787.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.99   CHANNEL SLOPE =  0.2213
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.795
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.43      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.01
  AVERAGE FLOW DEPTH(FEET) =   1.20   TRAVEL TIME(MIN.) =   2.00
  Tc(MIN.) =   11.53
  SUBAREA AREA(ACRES) =    26.43       SUBAREA RUNOFF(CFS) =   30.80
  EFFECTIVE AREA(ACRES) =     40.07     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =      46.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   8.60
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11403.00 =    1897.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11403.00 TO NODE  11404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2787.96  DOWNSTREAM(FEET) =   2518.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1956.80   CHANNEL SLOPE =  0.1376
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.367
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       67.85      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      73.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.11
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   4.02
  Tc(MIN.) =   15.55
  SUBAREA AREA(ACRES) =    67.85       SUBAREA RUNOFF(CFS) =   52.95
  EFFECTIVE AREA(ACRES) =    107.92     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.9         PEAK FLOW RATE(CFS) =      84.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =   8.35
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11404.00 =    3853.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11404.00 TO NODE  11405.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2518.71  DOWNSTREAM(FEET) =   2304.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.99   CHANNEL SLOPE =  0.1101
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.213
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.61      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     110.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   2.11   TRAVEL TIME(MIN.) =   3.93
  Tc(MIN.) =   19.48
  SUBAREA AREA(ACRES) =    80.61       SUBAREA RUNOFF(CFS) =   51.73
  EFFECTIVE AREA(ACRES) =    188.53     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      188.5         PEAK FLOW RATE(CFS) =     120.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.19   FLOW VELOCITY(FEET/SEC.) =   8.43
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11405.00 =    5798.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11405.00 TO NODE  11406.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2304.57  DOWNSTREAM(FEET) =   1888.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3280.59   CHANNEL SLOPE =  0.1270
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.025
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      111.04      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     147.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.33
  AVERAGE FLOW DEPTH(FEET) =   2.29   TRAVEL TIME(MIN.) =   5.86
  Tc(MIN.) =   25.34
  SUBAREA AREA(ACRES) =   111.04       SUBAREA RUNOFF(CFS) =   52.44
  EFFECTIVE AREA(ACRES) =    299.57     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      299.6         PEAK FLOW RATE(CFS) =     141.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.26   FLOW VELOCITY(FEET/SEC.) =   9.22
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11406.00 =    9079.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11406.00 TO NODE  11407.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1888.00  DOWNSTREAM(FEET) =   1539.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2842.33   CHANNEL SLOPE =  0.1226
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.912
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.19      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     167.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.52
  AVERAGE FLOW DEPTH(FEET) =   2.42   TRAVEL TIME(MIN.) =   4.98
  Tc(MIN.) =   30.32
  SUBAREA AREA(ACRES) =   141.19       SUBAREA RUNOFF(CFS) =   52.34
  EFFECTIVE AREA(ACRES) =    440.76     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      440.8         PEAK FLOW RATE(CFS) =     163.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.40   FLOW VELOCITY(FEET/SEC.) =   9.45
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11407.00 =   11921.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11407.00 TO NODE  11408.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1539.46  DOWNSTREAM(FEET) =   1268.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2859.01   CHANNEL SLOPE =  0.0948
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.846
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      158.63      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     188.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.88
  AVERAGE FLOW DEPTH(FEET) =   2.66   TRAVEL TIME(MIN.) =   5.37
  Tc(MIN.) =   35.69
  SUBAREA AREA(ACRES) =   158.63       SUBAREA RUNOFF(CFS) =   49.37
  EFFECTIVE AREA(ACRES) =    599.39     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      599.4         PEAK FLOW RATE(CFS) =     186.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.64   FLOW VELOCITY(FEET/SEC.) =   8.89
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11408.00 =   14780.87 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11408.00 TO NODE  11409.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1268.36  DOWNSTREAM(FEET) =   1109.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2883.36   CHANNEL SLOPE =  0.0550
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.775
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      208.66      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     212.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.48
  AVERAGE FLOW DEPTH(FEET) =   3.08   TRAVEL TIME(MIN.) =   6.43
  Tc(MIN.) =   42.12
  SUBAREA AREA(ACRES) =   208.66       SUBAREA RUNOFF(CFS) =   51.69
  EFFECTIVE AREA(ACRES) =    808.05     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      808.1         PEAK FLOW RATE(CFS) =     200.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.01   FLOW VELOCITY(FEET/SEC.) =   7.36
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.00 =   17664.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.00 TO NODE  11409.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1109.80  DOWNSTREAM(FEET) =    953.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2734.25   CHANNEL SLOPE =  0.0572
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.725
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       97.66      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     210.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.57
  AVERAGE FLOW DEPTH(FEET) =   3.04   TRAVEL TIME(MIN.) =   6.02
  Tc(MIN.) =   48.13
  SUBAREA AREA(ACRES) =    97.66       SUBAREA RUNOFF(CFS) =   19.80
  EFFECTIVE AREA(ACRES) =    905.71     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      905.7         PEAK FLOW RATE(CFS) =     200.16
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  2.99   FLOW VELOCITY(FEET/SEC.) =   7.47
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.50 =   20398.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.50 TO NODE  11410.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    953.45  DOWNSTREAM(FEET) =    914.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.66   CHANNEL SLOPE =  0.0357
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.704
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      130.64      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     212.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.35
  AVERAGE FLOW DEPTH(FEET) =   3.34   TRAVEL TIME(MIN.) =   2.89
  Tc(MIN.) =   51.02
  SUBAREA AREA(ACRES) =   130.64       SUBAREA RUNOFF(CFS) =   23.96
  EFFECTIVE AREA(ACRES) =   1036.35     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1036.4         PEAK FLOW RATE(CFS) =     200.16
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.26   FLOW VELOCITY(FEET/SEC.) =   6.27
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11410.00 =   21499.14 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11410.00 TO NODE  11411.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    914.20  DOWNSTREAM(FEET) =    740.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3015.96   CHANNEL SLOPE =  0.0576
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.665
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      299.66      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     222.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.71
  AVERAGE FLOW DEPTH(FEET) =   3.10   TRAVEL TIME(MIN.) =   6.52
  Tc(MIN.) =   57.55
  SUBAREA AREA(ACRES) =   299.66       SUBAREA RUNOFF(CFS) =   44.57
  EFFECTIVE AREA(ACRES) =   1336.01     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
```



```
  TOTAL AREA(ACRES) =     1336.0         PEAK FLOW RATE(CFS) =     200.16
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.99   FLOW VELOCITY(FEET/SEC.) =   7.48
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11411.00 =   24515.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.43  DOWNSTREAM(FEET) =    651.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1605.97   CHANNEL SLOPE =  0.0553
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.647
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       70.41      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     204.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
  AVERAGE FLOW DEPTH(FEET) =   3.03   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =   61.15
  SUBAREA AREA(ACRES) =    70.41       SUBAREA RUNOFF(CFS) =    9.31
  EFFECTIVE AREA(ACRES) =   1406.42     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1406.4         PEAK FLOW RATE(CFS) =     200.16
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.01   FLOW VELOCITY(FEET/SEC.) =   7.37
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11431.00 =   26121.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S10.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc       Fp(Fm)      Ap     Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)     NODE
      1     3913.94   27.74  0.50( 0.50) 1.00    3432.1   11000.00
      2     3884.96   45.52  0.50( 0.50) 1.00    6603.6   10850.00
      3     3872.36   46.28  0.50( 0.50) 1.00    6739.0   10800.00
      4     3843.83   49.55  0.50( 0.50) 1.00    7436.4   10900.00
      5     3791.30   52.66  0.50( 0.50) 1.00    8023.8   10830.00
```

6	3746.67	54.55	0.50(0.50)	1.00	8336.2	10910.00
7	3732.90	55.01	0.50(0.50)	1.00	8399.9	10630.00
8	3209.18	71.54	0.50(0.50)	1.00	10873.3	10600.00
9	2957.84	82.80	0.50(0.50)	1.00	12577.0	10500.00
10	2770.73	90.35	0.50(0.50)	1.00	13618.7	10710.00
11	2718.26	92.13	0.50(0.50)	1.00	13817.2	10410.00
12	2475.62	100.62	0.50(0.50)	1.00	14641.3	10700.00
13	2268.48	108.15	0.50(0.50)	1.00	15313.9	10400.00
14	2104.74	114.69	0.50(0.50)	1.00	15804.4	10200.00
15	1811.77	126.33	0.50(0.50)	1.00	16533.8	10300.00
16	1794.89	126.88	0.50(0.50)	1.00	16556.0	10320.00
17	1654.02	131.54	0.50(0.50)	1.00	16664.7	10210.00
18	529.13	197.15	0.50(0.50)	1.00	17533.1	10100.00

TOTAL AREA(ACRES) = 17533.1

****

FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<

==========

PEAK FLOWRATE TABLE FILE NAME: S13.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1708.98	44.40	0.50(0.50)	1.00	3569.3	11330.00
2	1700.76	45.91	0.50(0.50)	1.00	3728.3	11350.00
3	1636.19	52.75	0.50(0.50)	1.00	4362.6	11300.00
4	1606.36	55.19	0.50(0.50)	1.00	4572.4	11250.00
5	1555.07	57.22	0.50(0.50)	1.00	4703.6	11130.00
6	1544.59	57.62	0.50(0.50)	1.00	4727.0	11220.00
7	1018.64	84.42	0.50(0.50)	1.00	6071.5	11201.00
8	1017.01	84.51	0.50(0.50)	1.00	6073.5	11111.00
9	1002.62	85.12	0.50(0.50)	1.00	6081.5	11101.00

TOTAL AREA(ACRES) = 6081.5

****

FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 14.0

>>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

==========

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1708.98	44.40	0.50(0.50)	1.00	3569.3	11330.00
2	1700.76	45.91	0.50(0.50)	1.00	3728.3	11350.00
3	1636.19	52.75	0.50(0.50)	1.00	4362.6	11300.00
4	1606.36	55.19	0.50(0.50)	1.00	4572.4	11250.00
5	1555.07	57.22	0.50(0.50)	1.00	4703.6	11130.00
6	1544.59	57.62	0.50(0.50)	1.00	4727.0	11220.00
7	1018.64	84.42	0.50(0.50)	1.00	6071.5	11201.00
8	1017.01	84.51	0.50(0.50)	1.00	6073.5	11111.00
9	1002.62	85.12	0.50(0.50)	1.00	6081.5	11101.00

TOTAL AREA(ACRES) = 6081.5

****

FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1708.98	44.40	0.756	0.50(0.50)	1.00	3569.3	11330.00
2	1700.76	45.91	0.744	0.50(0.50)	1.00	3728.3	11350.00
3	1636.19	52.75	0.694	0.50(0.50)	1.00	4362.6	11300.00
4	1606.36	55.19	0.679	0.50(0.50)	1.00	4572.4	11250.00
5	1555.07	57.22	0.667	0.50(0.50)	1.00	4703.6	11130.00
6	1544.59	57.62	0.665	0.50(0.50)	1.00	4727.0	11220.00
7	1018.64	84.42	0.570	0.50(0.50)	1.00	6071.5	11201.00
8	1017.01	84.51	0.569	0.50(0.50)	1.00	6073.5	11111.00
9	1002.62	85.12	0.567	0.50(0.50)	1.00	6081.5	11101.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3913.94	27.74	0.969	0.50(0.50)	1.00	3432.1	11000.00
2	3884.96	45.52	0.747	0.50(0.50)	1.00	6603.6	10850.00
3	3872.36	46.28	0.741	0.50(0.50)	1.00	6739.0	10800.00
4	3843.83	49.55	0.714	0.50(0.50)	1.00	7436.4	10900.00
5	3791.30	52.66	0.694	0.50(0.50)	1.00	8023.8	10830.00
6	3746.67	54.55	0.683	0.50(0.50)	1.00	8336.2	10910.00
7	3732.90	55.01	0.680	0.50(0.50)	1.00	8399.9	10630.00
8	3209.18	71.54	0.613	0.50(0.50)	1.00	10873.3	10600.00
9	2957.84	82.80	0.575	0.50(0.50)	1.00	12577.0	10500.00
10	2770.73	90.35	0.550	0.50(0.50)	1.00	13618.7	10710.00
11	2718.26	92.13	0.547	0.50(0.50)	1.00	13817.2	10410.00
12	2475.62	100.62	0.532	0.50(0.50)	1.00	14641.3	10700.00
13	2268.48	108.15	0.518	0.50(0.50)	1.00	15313.9	10400.00
14	2104.74	114.69	0.507	0.50(0.50)	1.00	15804.4	10200.00
15	1811.77	126.33	0.489	0.50(0.50)	1.00	16533.8	10300.00
16	1794.89	126.88	0.489	0.50(0.50)	1.00	16556.0	10320.00
17	1654.02	131.54	0.483	0.50(0.50)	1.00	16664.7	10210.00
18	529.13	197.15	0.413	0.50(0.50)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5622.92	27.74	0.969	0.50(0.50)	1.00	5662.0	11000.00
2	5595.77	44.40	0.756	0.50(0.50)	1.00	9972.6	11330.00
3	5587.83	45.52	0.747	0.50(0.50)	1.00	10291.1	10850.00
4	5579.25	45.91	0.744	0.50(0.50)	1.00	10401.4	11350.00
5	5569.65	46.28	0.741	0.50(0.50)	1.00	10501.4	10800.00
6	5510.24	49.55	0.714	0.50(0.50)	1.00	11502.2	10900.00
7	5428.40	52.66	0.694	0.50(0.50)	1.00	12377.5	10830.00
8	5425.23	52.75	0.694	0.50(0.50)	1.00	12402.3	11300.00
9	5360.80	54.55	0.683	0.50(0.50)	1.00	12854.0	10910.00
10	5341.46	55.01	0.680	0.50(0.50)	1.00	12956.8	10630.00
11	5333.59	55.19	0.679	0.50(0.50)	1.00	12999.1	11250.00
12	5217.87	57.22	0.667	0.50(0.50)	1.00	13434.6	11130.00
13	5194.69	57.62	0.665	0.50(0.50)	1.00	13518.0	11220.00
14	4480.67	71.54	0.613	0.50(0.50)	1.00	16298.5	10600.00
15	4008.30	82.80	0.575	0.50(0.50)	1.00	18567.2	10500.00

```
    16     3936.27   84.42    0.570  0.50( 0.50) 1.00   18872.3   11201.00
    17     3932.48   84.51    0.569  0.50( 0.50) 1.00   18886.4   11111.00
    18     3902.79   85.12    0.567  0.50( 0.50) 1.00   18979.5   11101.00
    19     3523.56   90.35    0.550  0.50( 0.50) 1.00   19700.1   10710.00
    20     3423.61   92.13    0.547  0.50( 0.50) 1.00   19898.6   10410.00
    21     2954.64  100.62    0.532  0.50( 0.50) 1.00   20722.8   10700.00
    22     2546.79  108.15    0.518  0.50( 0.50) 1.00   21395.4   10400.00
    23     2208.84  114.69    0.507  0.50( 0.50) 1.00   21885.8   10200.00
    24     1821.51  126.33    0.489  0.50( 0.50) 1.00   22615.3   10300.00
    25     1804.62  126.88    0.489  0.50( 0.50) 1.00   22637.5   10320.00
    26     1663.64  131.54    0.483  0.50( 0.50) 1.00   22746.2   10210.00
    27      537.36  197.15    0.413  0.50( 0.50) 1.00   23614.5   10100.00
   TOTAL AREA(ACRES) =     23614.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5622.92  Tc(MIN.) =   27.740
  EFFECTIVE AREA(ACRES) =   5661.99  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    23614.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11363.00 =   69154.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11363.00 TO NODE  11431.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    678.93  DOWNSTREAM(FEET) =    651.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2069.94   CHANNEL SLOPE =  0.0132
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.907
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.16      0.50     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5653.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.38
  AVERAGE FLOW DEPTH(FEET) =  12.87   TRAVEL TIME(MIN.) =   3.03
  Tc(MIN.) =   30.77
  SUBAREA AREA(ACRES) =   165.16       SUBAREA RUNOFF(CFS) =   60.62
  EFFECTIVE AREA(ACRES) =   5827.15     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    23779.7         PEAK FLOW RATE(CFS) =    5622.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.84   FLOW VELOCITY(FEET/SEC.) =  11.37
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11431.00 =   71223.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
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** MAIN STREAM CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     5622.92   30.77    0.907  0.50( 0.50) 1.00    5827.1   11000.00
    2     5595.77   47.44    0.731  0.50( 0.50) 1.00   10137.7   11330.00
    3     5587.83   48.56    0.722  0.50( 0.50) 1.00   10456.2   10850.00
    4     5579.25   48.95    0.719  0.50( 0.50) 1.00   10566.6   11350.00
    5     5569.65   49.32    0.716  0.50( 0.50) 1.00   10666.6   10800.00
    6     5510.24   52.60    0.695  0.50( 0.50) 1.00   11667.4   10900.00
    7     5428.40   55.72    0.676  0.50( 0.50) 1.00   12542.7   10830.00
    8     5425.23   55.82    0.676  0.50( 0.50) 1.00   12567.5   11300.00
    9     5360.80   57.62    0.665  0.50( 0.50) 1.00   13019.2   10910.00
   10     5341.46   58.08    0.662  0.50( 0.50) 1.00   13122.0   10630.00
   11     5333.59   58.26    0.661  0.50( 0.50) 1.00   13164.2   11250.00
   12     5217.87   60.31    0.650  0.50( 0.50) 1.00   13599.8   11130.00
   13     5194.69   60.72    0.649  0.50( 0.50) 1.00   13683.2   11220.00
   14     4480.67   74.75    0.602  0.50( 0.50) 1.00   16463.6   10600.00
   15     4008.30   86.10    0.564  0.50( 0.50) 1.00   18732.3   10500.00
   16     3936.27   87.74    0.559  0.50( 0.50) 1.00   19037.5   11201.00
   17     3932.48   87.82    0.558  0.50( 0.50) 1.00   19051.5   11111.00
   18     3902.79   88.45    0.556  0.50( 0.50) 1.00   19144.7   11101.00
   19     3523.56   93.75    0.544  0.50( 0.50) 1.00   19865.3   10710.00
   20     3423.61   95.56    0.541  0.50( 0.50) 1.00   20063.8   10410.00
   21     2954.64  104.18    0.525  0.50( 0.50) 1.00   20887.9   10700.00
   22     2546.79  111.85    0.512  0.50( 0.50) 1.00   21560.6   10400.00
   23     2208.84  118.52    0.500  0.50( 0.50) 1.00   22051.0   10200.00
   24     1821.51  130.35    0.484  0.50( 0.50) 1.00   22780.4   10300.00
   25     1804.62  130.91    0.484  0.50( 0.50) 1.00   22802.6   10320.00
   26     1663.64  135.65    0.478  0.50( 0.50) 1.00   22911.3   10210.00
   27      537.36  202.60    0.410  0.50( 0.50) 1.00   23779.7   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11431.00 =   71223.96 FEET.

** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      200.16   61.15    0.647  0.50( 0.50) 1.00    1406.4   11401.00
LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11431.00 =   26121.07 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     5823.09   30.77    0.907  0.50( 0.50) 1.00    6534.8   11000.00
    2     5795.93   47.44    0.731  0.50( 0.50) 1.00   11228.7   11330.00
    3     5788.00   48.56    0.722  0.50( 0.50) 1.00   11573.0   10850.00
    4     5779.42   48.95    0.719  0.50( 0.50) 1.00   11692.3   11350.00
    5     5769.81   49.32    0.716  0.50( 0.50) 1.00   11800.8   10800.00
    6     5710.40   52.60    0.695  0.50( 0.50) 1.00   12877.1   10900.00
    7     5628.57   55.72    0.676  0.50( 0.50) 1.00   13824.1   10830.00
    8     5625.39   55.82    0.676  0.50( 0.50) 1.00   13851.1   11300.00
    9     5560.96   57.62    0.665  0.50( 0.50) 1.00   14344.4   10910.00
   10     5541.62   58.08    0.662  0.50( 0.50) 1.00   14457.7   10630.00
   11     5533.75   58.26    0.661  0.50( 0.50) 1.00   14504.1   11250.00
   12     5418.03   60.31    0.650  0.50( 0.50) 1.00   14986.8   11130.00
   13     5394.85   60.72    0.649  0.50( 0.50) 1.00   15079.5   11220.00
   14     5372.52   61.15    0.647  0.50( 0.50) 1.00   15176.6   11401.00
   15     4619.12   74.75    0.602  0.50( 0.50) 1.00   17870.1   10600.00
   16     4095.19   86.10    0.564  0.50( 0.50) 1.00   20138.8   10500.00
   17     4015.74   87.74    0.559  0.50( 0.50) 1.00   20443.9   11201.00
```

18	4011.55	87.82	0.558	0.50(0.50)	1.00	20458.0	11111.00
19	3979.02	88.45	0.556	0.50(0.50)	1.00	20551.1	11101.00
20	3583.55	93.75	0.544	0.50(0.50)	1.00	21271.7	10710.00
21	3479.17	95.56	0.541	0.50(0.50)	1.00	21470.2	10410.00
22	2989.06	104.18	0.525	0.50(0.50)	1.00	22294.3	10700.00
23	2562.41	111.85	0.512	0.50(0.50)	1.00	22967.0	10400.00
24	2208.84	118.52	0.500	0.50(0.50)	1.00	23457.4	10200.00
25	1821.50	130.35	0.484	0.50(0.50)	1.00	24186.8	10300.00
26	1804.62	130.91	0.484	0.50(0.50)	1.00	24209.1	10320.00
27	1663.63	135.65	0.478	0.50(0.50)	1.00	24317.7	10210.00
28	537.36	202.60	0.410	0.50(0.50)	1.00	25186.1	10100.00

TOTAL AREA(ACRES) = 25186.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5823.09 Tc(MIN.) = 30.770
EFFECTIVE AREA(ACRES) = 6534.80 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25186.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 25186.1 TC(MIN.) = 30.77
EFFECTIVE AREA(ACRES) = 6534.80 AREA-AVERAGED Fm(INCH/HR)= 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.998
PEAK FLOW RATE(CFS) = 5823.09

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5823.09	30.77	0.907	0.50(0.50)	1.00	6534.8	11000.00
2	5795.93	47.44	0.731	0.50(0.50)	1.00	11228.7	11330.00
3	5788.00	48.56	0.722	0.50(0.50)	1.00	11573.0	10850.00
4	5779.42	48.95	0.719	0.50(0.50)	1.00	11692.3	11350.00
5	5769.81	49.32	0.716	0.50(0.50)	1.00	11800.8	10800.00
6	5710.40	52.60	0.695	0.50(0.50)	1.00	12877.1	10900.00
7	5628.57	55.72	0.676	0.50(0.50)	1.00	13824.1	10830.00
8	5625.39	55.82	0.676	0.50(0.50)	1.00	13851.1	11300.00
9	5560.96	57.62	0.665	0.50(0.50)	1.00	14344.4	10910.00
10	5541.62	58.08	0.662	0.50(0.50)	1.00	14457.7	10630.00
11	5533.75	58.26	0.661	0.50(0.50)	1.00	14504.1	11250.00
12	5418.03	60.31	0.650	0.50(0.50)	1.00	14986.8	11130.00
13	5394.85	60.72	0.649	0.50(0.50)	1.00	15079.5	11220.00
14	5372.52	61.15	0.647	0.50(0.50)	1.00	15176.6	11401.00
15	4619.12	74.75	0.602	0.50(0.50)	1.00	17870.1	10600.00
16	4095.19	86.10	0.564	0.50(0.50)	1.00	20138.8	10500.00
17	4015.74	87.74	0.559	0.50(0.50)	1.00	20443.9	11201.00
18	4011.55	87.82	0.558	0.50(0.50)	1.00	20458.0	11111.00
19	3979.02	88.45	0.556	0.50(0.50)	1.00	20551.1	11101.00
20	3583.55	93.75	0.544	0.50(0.50)	1.00	21271.7	10710.00
21	3479.17	95.56	0.541	0.50(0.50)	1.00	21470.2	10410.00
22	2989.06	104.18	0.525	0.50(0.50)	1.00	22294.3	10700.00
23	2562.41	111.85	0.512	0.50(0.50)	1.00	22967.0	10400.00
24	2208.84	118.52	0.500	0.50(0.50)	1.00	23457.4	10200.00
25	1821.50	130.35	0.484	0.50(0.50)	1.00	24186.8	10300.00
26	1804.62	130.91	0.484	0.50(0.50)	1.00	24209.1	10320.00
27	1663.63	135.65	0.478	0.50(0.50)	1.00	24317.7	10210.00
28	537.36	202.60	0.410	0.50(0.50)	1.00	25186.1	10100.00

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END OF RATIONAL METHOD ANALYSIS

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************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S15.DAT
  TIME/DATE OF STUDY: 10:30 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.911
   2)   10.00;  1.910
   3)   15.00;  1.364
   4)   20.00;  1.170
   5)   25.00;  1.015
   6)   30.00;  0.904
   7)   40.00;  0.780
   8)   50.00;  0.696
   9)   60.00;  0.637
  10)   90.00;  0.536
  11)  120.00;  0.480
  12)  180.00;  0.407
  13)  360.00;  0.307
  14) 1440.00;  0.137
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11500.00 TO NODE  11501.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   352.85
  ELEVATION DATA: UPSTREAM(FEET) =   1891.25  DOWNSTREAM(FEET) =   1665.22

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.064
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.298
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        1.58      0.50     1.000     0    8.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.56
  TOTAL AREA(ACRES) =      1.58   PEAK FLOW RATE(CFS) =      2.56

************************************************************************
  FLOW PROCESS FROM NODE  11501.00 TO NODE  11502.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1665.22  DOWNSTREAM(FEET) =   1423.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.67   CHANNEL SLOPE =  0.3849
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.983
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        6.84      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.66
  AVERAGE FLOW DEPTH(FEET) =   0.60   TRAVEL TIME(MIN.) =   1.57
  Tc(MIN.) =    9.63
  SUBAREA AREA(ACRES) =     6.84       SUBAREA RUNOFF(CFS) =    9.13
  EFFECTIVE AREA(ACRES) =      8.42     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.4         PEAK FLOW RATE(CFS) =      11.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   7.38
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11502.00 =     980.52 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11502.00 TO NODE  11503.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1423.64  DOWNSTREAM(FEET) =   1258.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   937.16   CHANNEL SLOPE =  0.1758
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.702
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.16      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.89
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   11.90
  SUBAREA AREA(ACRES) =    28.16       SUBAREA RUNOFF(CFS) =   30.47
  EFFECTIVE AREA(ACRES) =     36.58     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       36.6         PEAK FLOW RATE(CFS) =      39.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   7.61
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11503.00 =    1917.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11503.00 TO NODE  11504.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1258.86  DOWNSTREAM(FEET) =   1009.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.29   CHANNEL SLOPE =  0.1298
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.323
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.67      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.71
  AVERAGE FLOW DEPTH(FEET) =   1.68   TRAVEL TIME(MIN.) =   4.16
  Tc(MIN.) =   16.06
  SUBAREA AREA(ACRES) =    69.67       SUBAREA RUNOFF(CFS) =   51.58
  EFFECTIVE AREA(ACRES) =    106.25     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.2         PEAK FLOW RATE(CFS) =      78.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =   8.05
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11504.00 =    3841.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1009.04  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2817.91   CHANNEL SLOPE =  0.1475
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.128
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       65.12      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      97.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.87
  AVERAGE FLOW DEPTH(FEET) =   1.91   TRAVEL TIME(MIN.) =   5.29
  Tc(MIN.) =   21.35
  SUBAREA AREA(ACRES) =    65.12       SUBAREA RUNOFF(CFS) =   36.80
  EFFECTIVE AREA(ACRES) =    171.37     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.4         PEAK FLOW RATE(CFS) =      96.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.90   FLOW VELOCITY(FEET/SEC.) =   8.90
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S14.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     5823.09   30.77  0.50( 0.50) 1.00    6534.8   11000.00
      2     5795.93   47.44  0.50( 0.50) 1.00   11228.7   11330.00
      3     5788.00   48.56  0.50( 0.50) 1.00   11573.0   10850.00
      4     5710.40   52.60  0.50( 0.50) 1.00   12877.1   10900.00
      5     5628.57   55.72  0.50( 0.50) 1.00   13824.1   10830.00
      6     5560.96   57.62  0.50( 0.50) 1.00   14344.4   10910.00
      7     5418.03   60.31  0.50( 0.50) 1.00   14986.8   11130.00
      8     4619.12   74.75  0.50( 0.50) 1.00   17870.1   10600.00
      9     4095.19   86.10  0.50( 0.50) 1.00   20138.8   10500.00
     10     4015.74   87.74  0.50( 0.50) 1.00   20443.9   11201.00
     11     3979.02   88.45  0.50( 0.50) 1.00   20551.1   11101.00
     12     3583.55   93.75  0.50( 0.50) 1.00   21271.7   10710.00
     13     3479.17   95.56  0.50( 0.50) 1.00   21470.2   10410.00
     14     2989.06  104.18  0.50( 0.50) 1.00   22294.3   10700.00
     15     2562.41  111.85  0.50( 0.50) 1.00   22967.0   10400.00
     16     2208.84  118.52  0.50( 0.50) 1.00   23457.4   10200.00
     17     1821.50  130.35  0.50( 0.50) 1.00   24186.8   10300.00
```

```
     18     1804.62  130.91  0.50( 0.50) 1.00   24209.1   10320.00
     19     1663.63  135.65  0.50( 0.50) 1.00   24317.7   10210.00
     20      537.36  202.60  0.50( 0.50) 1.00   25186.1   10100.00
    TOTAL AREA(ACRES) =    25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)           (ACRES)    NODE
      1     5823.09   30.77  0.50( 0.50) 1.00    6534.8   11000.00
      2     5795.93   47.44  0.50( 0.50) 1.00   11228.7   11330.00
      3     5788.00   48.56  0.50( 0.50) 1.00   11573.0   10850.00
      4     5710.40   52.60  0.50( 0.50) 1.00   12877.1   10900.00
      5     5628.57   55.72  0.50( 0.50) 1.00   13824.1   10830.00
      6     5560.96   57.62  0.50( 0.50) 1.00   14344.4   10910.00
      7     5418.03   60.31  0.50( 0.50) 1.00   14986.8   11130.00
      8     4619.12   74.75  0.50( 0.50) 1.00   17870.1   10600.00
      9     4095.19   86.10  0.50( 0.50) 1.00   20138.8   10500.00
     10     4015.74   87.74  0.50( 0.50) 1.00   20443.9   11201.00
     11     3979.02   88.45  0.50( 0.50) 1.00   20551.1   11101.00
     12     3583.55   93.75  0.50( 0.50) 1.00   21271.7   10710.00
     13     3479.17   95.56  0.50( 0.50) 1.00   21470.2   10410.00
     14     2989.06  104.18  0.50( 0.50) 1.00   22294.3   10700.00
     15     2562.41  111.85  0.50( 0.50) 1.00   22967.0   10400.00
     16     2208.84  118.52  0.50( 0.50) 1.00   23457.4   10200.00
     17     1821.50  130.35  0.50( 0.50) 1.00   24186.8   10300.00
     18     1804.62  130.91  0.50( 0.50) 1.00   24209.1   10320.00
     19     1663.63  135.65  0.50( 0.50) 1.00   24317.7   10210.00
     20      537.36  202.60  0.50( 0.50) 1.00   25186.1   10100.00
    TOTAL AREA(ACRES) =     25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    651.70  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2004.08   CHANNEL SLOPE =  0.0291
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.868
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.88      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5832.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.45
  AVERAGE FLOW DEPTH(FEET) =  11.22   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   32.93
  SUBAREA AREA(ACRES) =    54.88       SUBAREA RUNOFF(CFS) =   18.15
```



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  EFFECTIVE AREA(ACRES) =   6589.68     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    25241.0         PEAK FLOW RATE(CFS) =    5823.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.21   FLOW VELOCITY(FEET/SEC.) =  15.44
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5823.09   32.93    0.868  0.50( 0.50) 1.00    6589.7   11000.00
      2     5795.93   49.60    0.699  0.50( 0.50) 1.00   11283.5   11330.00
      3     5788.00   50.73    0.692  0.50( 0.50) 1.00   11627.9   10850.00
      4     5710.40   54.77    0.668  0.50( 0.50) 1.00   12931.9   10900.00
      5     5628.57   57.90    0.649  0.50( 0.50) 1.00   13879.0   10830.00
      6     5560.96   59.81    0.638  0.50( 0.50) 1.00   14399.2   10910.00
      7     5418.03   62.51    0.629  0.50( 0.50) 1.00   15041.6   11130.00
      8     4619.12   77.04    0.580  0.50( 0.50) 1.00   17924.9   10600.00
      9     4095.19   88.46    0.541  0.50( 0.50) 1.00   20193.6   10500.00
     10     4015.74   90.11    0.536  0.50( 0.50) 1.00   20498.8   11201.00
     11     3979.02   90.83    0.534  0.50( 0.50) 1.00   20606.0   11101.00
     12     3583.55   96.19    0.524  0.50( 0.50) 1.00   21326.6   10710.00
     13     3479.17   98.02    0.521  0.50( 0.50) 1.00   21525.1   10410.00
     14     2989.06  106.74    0.505  0.50( 0.50) 1.00   22349.2   10700.00
     15     2562.41  114.50    0.490  0.50( 0.50) 1.00   23021.9   10400.00
     16     2208.84  121.28    0.478  0.50( 0.50) 1.00   23512.3   10200.00
     17     1821.50  133.24    0.464  0.50( 0.50) 1.00   24241.7   10300.00
     18     1804.62  133.80    0.463  0.50( 0.50) 1.00   24263.9   10320.00
     19     1663.63  138.60    0.457  0.50( 0.50) 1.00   24372.6   10210.00
     20      537.36  206.53    0.392  0.50( 0.50) 1.00   25241.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       96.83   21.35    1.128  0.50( 0.50) 1.00     171.4   11500.00
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5919.92   21.35    1.128  0.50( 0.50) 1.00    4444.2   11500.00
      2     5879.76   32.93    0.868  0.50( 0.50) 1.00    6761.0   11000.00
      3     5826.65   49.60    0.699  0.50( 0.50) 1.00   11454.9   11330.00
      4     5817.54   50.73    0.692  0.50( 0.50) 1.00   11799.3   10850.00
      5     5736.26   54.77    0.668  0.50( 0.50) 1.00   13103.3   10900.00
      6     5651.58   57.90    0.649  0.50( 0.50) 1.00   14050.3   10830.00
      7     5582.23   59.81    0.638  0.50( 0.50) 1.00   14570.6   10910.00
      8     5437.83   62.51    0.629  0.50( 0.50) 1.00   15213.0   11130.00
      9     4631.37   77.04    0.580  0.50( 0.50) 1.00   18096.3   10600.00
```

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     10     4101.50   88.46    0.541  0.50( 0.50) 1.00   20365.0   10500.00
     11     4021.23   90.11    0.536  0.50( 0.50) 1.00   20670.2   11201.00
     12     3984.31   90.83    0.534  0.50( 0.50) 1.00   20777.3   11101.00
     13     3587.28   96.19    0.524  0.50( 0.50) 1.00   21498.0   10710.00
     14     3482.38   98.02    0.521  0.50( 0.50) 1.00   21696.5   10410.00
     15     2989.76  106.74    0.505  0.50( 0.50) 1.00   22520.6   10700.00
     16     2562.41  114.50    0.490  0.50( 0.50) 1.00   23193.2   10400.00
     17     2208.84  121.28    0.478  0.50( 0.50) 1.00   23683.7   10200.00
     18     1821.50  133.24    0.464  0.50( 0.50) 1.00   24413.1   10300.00
     19     1804.62  133.80    0.463  0.50( 0.50) 1.00   24435.3   10320.00
     20     1663.63  138.60    0.457  0.50( 0.50) 1.00   24544.0   10210.00
     21      537.36  206.53    0.392  0.50( 0.50) 1.00   25412.4   10100.00
   TOTAL AREA(ACRES) =     25412.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5919.92  Tc(MIN.) =   21.354
  EFFECTIVE AREA(ACRES) =   4444.21  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    25412.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11520.00 TO NODE  11540.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    593.37  DOWNSTREAM(FEET) =    577.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1515.75   CHANNEL SLOPE =  0.0103
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.065
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      100.60      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5945.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.42
  AVERAGE FLOW DEPTH(FEET) =  12.63   TRAVEL TIME(MIN.) =   2.03
  Tc(MIN.) =   23.39
  SUBAREA AREA(ACRES) =   100.60       SUBAREA RUNOFF(CFS) =   51.14
  EFFECTIVE AREA(ACRES) =   4544.81     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    25513.0         PEAK FLOW RATE(CFS) =    5919.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.61   FLOW VELOCITY(FEET/SEC.) =  12.42
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11540.00 =   74743.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11520.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.39
  RAINFALL INTENSITY(INCH/HR) =   1.06
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    4544.81
  TOTAL STREAM AREA(ACRES) =   25512.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    5919.92

****************************************************************************
  FLOW PROCESS FROM NODE  11530.00 TO NODE  11531.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   278.68
  ELEVATION DATA: UPSTREAM(FEET) =   1593.31  DOWNSTREAM(FEET) =   1523.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.844
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.141
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"               -        1.18      0.50     1.000     0    8.84
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.74
  TOTAL AREA(ACRES) =      1.18   PEAK FLOW RATE(CFS) =      1.74

****************************************************************************
  FLOW PROCESS FROM NODE  11531.00 TO NODE  11532.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1523.14  DOWNSTREAM(FEET) =   1297.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =   698.37   CHANNEL SLOPE =  0.3230
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.829
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.32      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.13
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   1.90
  Tc(MIN.) =   10.74
  SUBAREA AREA(ACRES) =     8.32       SUBAREA RUNOFF(CFS) =    9.95
  EFFECTIVE AREA(ACRES) =      9.50     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.5         PEAK FLOW RATE(CFS) =      11.36
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   6.97
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11532.00 =     977.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11532.00 TO NODE  11533.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1297.56  DOWNSTREAM(FEET) =   1134.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.17   CHANNEL SLOPE =  0.1693
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.551
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.50      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.30
  AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   2.54
  Tc(MIN.) =   13.29
  SUBAREA AREA(ACRES) =    18.50       SUBAREA RUNOFF(CFS) =   17.50
  EFFECTIVE AREA(ACRES) =     28.00     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.0         PEAK FLOW RATE(CFS) =      26.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.14   FLOW VELOCITY(FEET/SEC.) =   6.77
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11533.00 =    1939.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11533.00 TO NODE  11534.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1134.68  DOWNSTREAM(FEET) =   1002.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.78   CHANNEL SLOPE =  0.1379
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.352
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.44      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.85
  AVERAGE FLOW DEPTH(FEET) =   1.65   TRAVEL TIME(MIN.) =   2.03
  Tc(MIN.) =   15.32
  SUBAREA AREA(ACRES) =    98.44       SUBAREA RUNOFF(CFS) =   75.43
  EFFECTIVE AREA(ACRES) =    126.44     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
```



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  TOTAL AREA(ACRES) =      126.4         PEAK FLOW RATE(CFS) =      96.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   8.69
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11534.00 =    2896.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11534.00 TO NODE  11535.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1002.72  DOWNSTREAM(FEET) =    816.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2160.78   CHANNEL SLOPE =  0.0863
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.176
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.87      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     138.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.95
  AVERAGE FLOW DEPTH(FEET) =   2.41   TRAVEL TIME(MIN.) =   4.53
  Tc(MIN.) =   19.85
  SUBAREA AREA(ACRES) =   134.87       SUBAREA RUNOFF(CFS) =   82.02
  EFFECTIVE AREA(ACRES) =    261.31     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      261.3         PEAK FLOW RATE(CFS) =     158.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.54   FLOW VELOCITY(FEET/SEC.) =   8.24
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11535.00 =    5056.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    816.20  DOWNSTREAM(FEET) =    577.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3109.20   CHANNEL SLOPE =  0.0767
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.987
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.24      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     176.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.08
  AVERAGE FLOW DEPTH(FEET) =   2.70   TRAVEL TIME(MIN.) =   6.42
  Tc(MIN.) =   26.27
  SUBAREA AREA(ACRES) =    78.24       SUBAREA RUNOFF(CFS) =   34.27
```

```
  EFFECTIVE AREA(ACRES) =    339.55     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      339.5         PEAK FLOW RATE(CFS) =     158.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.59   FLOW VELOCITY(FEET/SEC.) =   7.89
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11540.00 =    8165.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.27
  RAINFALL INTENSITY(INCH/HR) =   0.99
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     339.55
  TOTAL STREAM AREA(ACRES) =     339.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     158.91

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5919.92   23.39    1.065  0.50( 0.50) 1.00    4544.8   11500.00
      1     5879.76   34.97    0.842  0.50( 0.50) 1.00    6861.6   11000.00
      1     5826.65   51.64    0.686  0.50( 0.50) 1.00   11555.5   11330.00
      1     5817.54   52.77    0.680  0.50( 0.50) 1.00   11899.9   10850.00
      1     5736.26   56.82    0.656  0.50( 0.50) 1.00   13203.9   10900.00
      1     5651.58   59.96    0.637  0.50( 0.50) 1.00   14150.9   10830.00
      1     5582.23   61.87    0.631  0.50( 0.50) 1.00   14671.2   10910.00
      1     5437.83   64.59    0.622  0.50( 0.50) 1.00   15313.6   11130.00
      1     4631.37   79.20    0.572  0.50( 0.50) 1.00   18196.9   10600.00
      1     4101.50   90.69    0.535  0.50( 0.50) 1.00   20465.6   10500.00
      1     4021.23   92.35    0.532  0.50( 0.50) 1.00   20770.8   11201.00
      1     3984.31   93.07    0.530  0.50( 0.50) 1.00   20877.9   11101.00
      1     3587.28   98.50    0.520  0.50( 0.50) 1.00   21598.6   10710.00
      1     3482.38  100.34    0.517  0.50( 0.50) 1.00   21797.1   10410.00
      1     2989.76  109.15    0.500  0.50( 0.50) 1.00   22621.2   10700.00
      1     2562.41  117.01    0.486  0.50( 0.50) 1.00   23293.8   10400.00
      1     2208.84  123.88    0.475  0.50( 0.50) 1.00   23784.3   10200.00
      1     1821.50  135.97    0.461  0.50( 0.50) 1.00   24513.7   10300.00
      1     1804.62  136.54    0.460  0.50( 0.50) 1.00   24535.9   10320.00
      1     1663.63  141.40    0.454  0.50( 0.50) 1.00   24644.6   10210.00
      1      537.36  210.23    0.390  0.50( 0.50) 1.00   25513.0   10100.00
      2      158.91   26.27    0.987  0.50( 0.50) 1.00     339.5   11530.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```



```
      1     6078.83   23.39    1.065  0.50( 0.50) 1.00    4847.2   11500.00
      2     6068.85   26.27    0.987  0.50( 0.50) 1.00    5460.1   11530.00
      3     5991.48   34.97    0.842  0.50( 0.50) 1.00    7201.2   11000.00
      4     5887.41   51.64    0.686  0.50( 0.50) 1.00   11895.1   11330.00
      5     5876.13   52.77    0.680  0.50( 0.50) 1.00   12239.4   10850.00
      6     5787.04   56.82    0.656  0.50( 0.50) 1.00   13543.5   10900.00
      7     5696.32   59.96    0.637  0.50( 0.50) 1.00   14490.5   10830.00
      8     5624.84   61.87    0.631  0.50( 0.50) 1.00   15010.8   10910.00
      9     5477.45   64.59    0.622  0.50( 0.50) 1.00   15653.2   11130.00
     10     4654.93   79.20    0.572  0.50( 0.50) 1.00   18536.5   10600.00
     11     4112.77   90.69    0.535  0.50( 0.50) 1.00   20805.2   10500.00
     12     4031.49   92.35    0.532  0.50( 0.50) 1.00   21110.3   11201.00
     13     3994.12   93.07    0.530  0.50( 0.50) 1.00   21217.5   11101.00
     14     3593.79   98.50    0.520  0.50( 0.50) 1.00   21938.1   10710.00
     15     3487.77  100.34    0.517  0.50( 0.50) 1.00   22136.6   10410.00
     16     2989.78  109.15    0.500  0.50( 0.50) 1.00   22960.7   10700.00
     17     2562.41  117.01    0.486  0.50( 0.50) 1.00   23633.4   10400.00
     18     2208.84  123.88    0.475  0.50( 0.50) 1.00   24123.8   10200.00
     19     1821.50  135.97    0.461  0.50( 0.50) 1.00   24853.2   10300.00
     20     1804.61  136.54    0.460  0.50( 0.50) 1.00   24875.5   10320.00
     21     1663.63  141.40    0.454  0.50( 0.50) 1.00   24984.1   10210.00
     22      537.36  210.23    0.390  0.50( 0.50) 1.00   25852.5   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    6078.83    Tc(MIN.) =    23.39
  EFFECTIVE AREA(ACRES) =    4847.15   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    25852.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11540.00 =   74743.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11540.00 TO NODE  11541.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    577.77  DOWNSTREAM(FEET) =    556.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.36   CHANNEL SLOPE =  0.0104
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.991
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      389.46      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6164.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.60
  AVERAGE FLOW DEPTH(FEET) =  12.77   TRAVEL TIME(MIN.) =   2.72
  Tc(MIN.) =   26.10
  SUBAREA AREA(ACRES) =   389.46       SUBAREA RUNOFF(CFS) =  171.87
  EFFECTIVE AREA(ACRES) =   5236.61     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26242.0         PEAK FLOW RATE(CFS) =    6078.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) = 12.71   FLOW VELOCITY(FEET/SEC.) =  12.55
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11541.00 =   76797.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11541.00 TO NODE  11542.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.39  DOWNSTREAM(FEET) =    523.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3267.94   CHANNEL SLOPE =  0.0101
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.898
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      330.30      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6138.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.46
  AVERAGE FLOW DEPTH(FEET) =  12.81   TRAVEL TIME(MIN.) =   4.37
  Tc(MIN.) =   30.47
  SUBAREA AREA(ACRES) =   330.30       SUBAREA RUNOFF(CFS) =  118.29
  EFFECTIVE AREA(ACRES) =   5566.91     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26572.3         PEAK FLOW RATE(CFS) =    6078.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.77   FLOW VELOCITY(FEET/SEC.) =  12.43
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11542.00 =   80065.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11542.00 TO NODE  11543.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    523.29  DOWNSTREAM(FEET) =    493.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2857.94   CHANNEL SLOPE =  0.0104
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.851
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      285.11      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6123.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.57
  AVERAGE FLOW DEPTH(FEET) =  12.75   TRAVEL TIME(MIN.) =   3.79
  Tc(MIN.) =   34.26
  SUBAREA AREA(ACRES) =   285.11       SUBAREA RUNOFF(CFS) =   90.04
  EFFECTIVE AREA(ACRES) =   5852.02     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
```



```
  TOTAL AREA(ACRES) =    26857.4         PEAK FLOW RATE(CFS) =    6078.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.71   FLOW VELOCITY(FEET/SEC.) =  12.54
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11543.00 =   82923.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11543.00 TO NODE  11544.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    493.61  DOWNSTREAM(FEET) =    480.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.01   CHANNEL SLOPE =  0.0068
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.813
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      303.63      0.50     0.987     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.987
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6122.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.73
  AVERAGE FLOW DEPTH(FEET) =  13.79   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   37.31
  SUBAREA AREA(ACRES) =   303.63       SUBAREA RUNOFF(CFS) =   87.34
  EFFECTIVE AREA(ACRES) =   6155.65     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27161.0         PEAK FLOW RATE(CFS) =    6078.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.75   FLOW VELOCITY(FEET/SEC.) =  10.72
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11544.00 =   84886.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11544.00 TO NODE  11545.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    480.21  DOWNSTREAM(FEET) =    456.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1914.49   CHANNEL SLOPE =  0.0122
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.784
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      184.16      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6102.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.33
  AVERAGE FLOW DEPTH(FEET) =  12.35   TRAVEL TIME(MIN.) =   2.39
```

```
  Tc(MIN.) =   39.71
  SUBAREA AREA(ACRES) =   184.16       SUBAREA RUNOFF(CFS) =   46.98
  EFFECTIVE AREA(ACRES) =   6339.81     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27345.2         PEAK FLOW RATE(CFS) =    6078.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.34   FLOW VELOCITY(FEET/SEC.) =  13.31
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11545.00 =   86800.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    456.90  DOWNSTREAM(FEET) =    436.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2322.79   CHANNEL SLOPE =  0.0089
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.755
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.95      0.50     0.844     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.844
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6101.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.85
  AVERAGE FLOW DEPTH(FEET) =  13.10   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   42.97
  SUBAREA AREA(ACRES) =   151.95       SUBAREA RUNOFF(CFS) =   45.52
  EFFECTIVE AREA(ACRES) =   6491.76     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    27497.1         PEAK FLOW RATE(CFS) =    6078.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.08   FLOW VELOCITY(FEET/SEC.) =  11.84
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    27497.1  TC(MIN.) =     42.97
  EFFECTIVE AREA(ACRES) =   6491.76  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.995
  PEAK FLOW RATE(CFS)   =    6078.83

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6078.83   42.97    0.755  0.50( 0.50) 0.99    6491.8   11500.00
      2     6068.85   45.87    0.731  0.50( 0.50) 0.99    7104.8   11530.00
      3     5991.48   54.64    0.669  0.50( 0.50) 1.00    8845.8   11000.00
      4     5887.41   71.41    0.599  0.50( 0.50) 1.00   13539.7   11330.00
      5     5876.13   72.55    0.595  0.50( 0.50) 1.00   13884.0   10850.00
      6     5787.04   76.68    0.581  0.50( 0.50) 1.00   15188.1   10900.00
      7     5696.32   79.89    0.570  0.50( 0.50) 1.00   16135.1   10830.00
```



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      8     5624.84   81.88    0.563  0.50( 0.50) 1.00   16655.4   10910.00
      9     5477.45   84.72    0.554  0.50( 0.50) 1.00   17297.8   11130.00
     10     4654.93  100.18    0.517  0.50( 0.50) 1.00   20181.1   10600.00
     11     4112.77  112.33    0.494  0.50( 0.50) 1.00   22449.8   10500.00
     12     4031.49  114.10    0.491  0.50( 0.50) 1.00   22754.9   11201.00
     13     3994.12  114.87    0.490  0.50( 0.50) 1.00   22862.1   11101.00
     14     3593.79  120.88    0.479  0.50( 0.50) 1.00   23582.7   10710.00
     15     3487.77  122.89    0.476  0.50( 0.50) 1.00   23781.2   10410.00
     16     2989.78  132.58    0.465  0.50( 0.50) 1.00   24605.4   10700.00
     17     2562.41  141.37    0.454  0.50( 0.50) 1.00   25278.0   10400.00
     18     2208.84  149.16    0.445  0.50( 0.50) 1.00   25768.4   10200.00
     19     1821.50  162.51    0.428  0.50( 0.50) 1.00   26497.8   10300.00
     20     1804.61  163.13    0.428  0.50( 0.50) 1.00   26520.1   10320.00
     21     1663.63  168.53    0.421  0.50( 0.50) 1.00   26628.8   10210.00
     22      537.36  246.21    0.370  0.50( 0.50) 1.00   27497.1   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S16.DAT
  TIME/DATE OF STUDY: 10:30 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.911
   2)   10.00;  1.910
   3)   15.00;  1.364
   4)   20.00;  1.170
   5)   25.00;  1.015
   6)   30.00;  0.904
   7)   40.00;  0.780
   8)   50.00;  0.696
   9)   60.00;  0.637
  10)   90.00;  0.536
  11)  120.00;  0.480
  12)  180.00;  0.407
  13)  360.00;  0.307
  14) 1440.00;  0.137
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11600.00 TO NODE  11601.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.21
  ELEVATION DATA: UPSTREAM(FEET) =   3061.08  DOWNSTREAM(FEET) =   2962.88

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.120
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.897
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        1.79      0.50     1.000     0   10.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.25
  TOTAL AREA(ACRES) =      1.79   PEAK FLOW RATE(CFS) =      2.25

**************************************************************************
  FLOW PROCESS FROM NODE  11601.00 TO NODE  11602.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.88  DOWNSTREAM(FEET) =   2839.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =   548.33   CHANNEL SLOPE =  0.2252
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.694
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        4.88      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.92
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   1.86
  Tc(MIN.) =   11.98
  SUBAREA AREA(ACRES) =     4.88       SUBAREA RUNOFF(CFS) =    5.24
  EFFECTIVE AREA(ACRES) =      6.67     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =       7.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   5.47
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11602.00 =     938.54 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11602.00 TO NODE  11603.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2839.39  DOWNSTREAM(FEET) =   2697.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.87   CHANNEL SLOPE =  0.1452
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.396
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.42      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.97
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   14.71
  SUBAREA AREA(ACRES) =    31.42       SUBAREA RUNOFF(CFS) =   25.34
  EFFECTIVE AREA(ACRES) =     38.09     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.1         PEAK FLOW RATE(CFS) =      30.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.24   FLOW VELOCITY(FEET/SEC.) =   6.65
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11603.00 =    1915.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11603.00 TO NODE  11604.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2697.55  DOWNSTREAM(FEET) =   2598.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1887.15   CHANNEL SLOPE =  0.0523
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.145
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.03      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.17
  AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   6.09
  Tc(MIN.) =   20.79
  SUBAREA AREA(ACRES) =    72.03       SUBAREA RUNOFF(CFS) =   41.83
  EFFECTIVE AREA(ACRES) =    110.12     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =      63.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.98   FLOW VELOCITY(FEET/SEC.) =   5.43
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11604.00 =    3802.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11604.00 TO NODE  11605.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2598.90  DOWNSTREAM(FEET) =   2464.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2488.89   CHANNEL SLOPE =  0.0541
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.952
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.28      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      83.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.88
  AVERAGE FLOW DEPTH(FEET) =   2.18   TRAVEL TIME(MIN.) =   7.05
  Tc(MIN.) =   27.84
  SUBAREA AREA(ACRES) =    96.28       SUBAREA RUNOFF(CFS) =   39.14
  EFFECTIVE AREA(ACRES) =    206.40     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.4         PEAK FLOW RATE(CFS) =      83.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.18   FLOW VELOCITY(FEET/SEC.) =   5.89
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11605.00 =    6291.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11605.00 TO NODE  11606.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.25  DOWNSTREAM(FEET) =   2359.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1936.71   CHANNEL SLOPE =  0.0538
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.869
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      266.26      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     128.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.53
  AVERAGE FLOW DEPTH(FEET) =   2.56   TRAVEL TIME(MIN.) =   4.94
  Tc(MIN.) =   32.78
  SUBAREA AREA(ACRES) =   266.26       SUBAREA RUNOFF(CFS) =   88.49
  EFFECTIVE AREA(ACRES) =    472.66     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      472.7         PEAK FLOW RATE(CFS) =     157.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.76   FLOW VELOCITY(FEET/SEC.) =   6.88
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11606.00 =    8228.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11606.00 TO NODE  11607.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2359.99  DOWNSTREAM(FEET) =   1905.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3829.49   CHANNEL SLOPE =  0.1188
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.786
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.44      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     174.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.48
  AVERAGE FLOW DEPTH(FEET) =   2.47   TRAVEL TIME(MIN.) =   6.73
  Tc(MIN.) =   39.52
  SUBAREA AREA(ACRES) =   132.44       SUBAREA RUNOFF(CFS) =   34.07
  EFFECTIVE AREA(ACRES) =    605.10     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      605.1         PEAK FLOW RATE(CFS) =     157.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.38   FLOW VELOCITY(FEET/SEC.) =   9.26
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11607.00 =   12057.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11607.00 TO NODE  11608.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1905.15  DOWNSTREAM(FEET) =   1717.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1095.02   CHANNEL SLOPE =  0.1710
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.770
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       76.91      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     166.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.76
  AVERAGE FLOW DEPTH(FEET) =   2.27   TRAVEL TIME(MIN.) =   1.70
  Tc(MIN.) =   41.21
  SUBAREA AREA(ACRES) =    76.91       SUBAREA RUNOFF(CFS) =   18.66
  EFFECTIVE AREA(ACRES) =    682.01     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      682.0         PEAK FLOW RATE(CFS) =     165.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.26   FLOW VELOCITY(FEET/SEC.) =  10.77
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11608.00 =   13152.67 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11608.00 TO NODE  11609.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1717.92  DOWNSTREAM(FEET) =   1516.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1480.24   CHANNEL SLOPE =  0.1362
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.750
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.91      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     202.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.37
  AVERAGE FLOW DEPTH(FEET) =   2.55   TRAVEL TIME(MIN.) =   2.38
  Tc(MIN.) =   43.59
  SUBAREA AREA(ACRES) =   328.91       SUBAREA RUNOFF(CFS) =   73.89
  EFFECTIVE AREA(ACRES) =   1010.92     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1010.9         PEAK FLOW RATE(CFS) =     227.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.66   FLOW VELOCITY(FEET/SEC.) =  10.70
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11609.00 =   14632.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11609.00 TO NODE  11610.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1516.24  DOWNSTREAM(FEET) =   1332.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.38   CHANNEL SLOPE =  0.0957
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.722
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      355.16      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     262.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.71
  AVERAGE FLOW DEPTH(FEET) =   3.00   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   46.90
  SUBAREA AREA(ACRES) =   355.16       SUBAREA RUNOFF(CFS) =   70.91
  EFFECTIVE AREA(ACRES) =   1366.08     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1366.1         PEAK FLOW RATE(CFS) =     272.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  3.05   FLOW VELOCITY(FEET/SEC.) =   9.79
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11610.00 =   16558.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11610.00 TO NODE  11611.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1332.01  DOWNSTREAM(FEET) =   1105.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2901.03   CHANNEL SLOPE =  0.0781
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.683
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      234.59      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     292.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.23
  AVERAGE FLOW DEPTH(FEET) =   3.25   TRAVEL TIME(MIN.) =   5.24
  Tc(MIN.) =   52.13
  SUBAREA AREA(ACRES) =   234.59       SUBAREA RUNOFF(CFS) =   38.68
  EFFECTIVE AREA(ACRES) =   1600.67     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1600.7         PEAK FLOW RATE(CFS) =     272.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.16   FLOW VELOCITY(FEET/SEC.) =   9.09
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11611.00 =   19459.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11611.00 TO NODE  11612.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.34  DOWNSTREAM(FEET) =   1030.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1982.46   CHANNEL SLOPE =  0.0378
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.656
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.67      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     287.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.01
  AVERAGE FLOW DEPTH(FEET) =   3.70   TRAVEL TIME(MIN.) =   4.71
  Tc(MIN.) =   56.85
  SUBAREA AREA(ACRES) =   212.67       SUBAREA RUNOFF(CFS) =   29.74
  EFFECTIVE AREA(ACRES) =   1813.34     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
```



```
  TOTAL AREA(ACRES) =     1813.3         PEAK FLOW RATE(CFS) =     272.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.63   FLOW VELOCITY(FEET/SEC.) =   6.91
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11612.00 =   21441.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.47  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3051.86   CHANNEL SLOPE =  0.0525
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.626
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      465.36      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     299.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.01
  AVERAGE FLOW DEPTH(FEET) =   3.53   TRAVEL TIME(MIN.) =   6.35
  Tc(MIN.) =   63.20
  SUBAREA AREA(ACRES) =   465.36       SUBAREA RUNOFF(CFS) =   52.78
  EFFECTIVE AREA(ACRES) =   2278.70     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2278.7         PEAK FLOW RATE(CFS) =     272.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.41   FLOW VELOCITY(FEET/SEC.) =   7.83
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   63.20
  RAINFALL INTENSITY(INCH/HR) =   0.63
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2278.70
  TOTAL STREAM AREA(ACRES) =    2278.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     272.75

****************************************************************************
  FLOW PROCESS FROM NODE  11620.00 TO NODE  11621.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   266.64
  ELEVATION DATA: UPSTREAM(FEET) =   2567.03  DOWNSTREAM(FEET) =   2486.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.387
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.233
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        0.69      0.50     1.000     0    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.08
  TOTAL AREA(ACRES) =      0.69   PEAK FLOW RATE(CFS) =      1.08

****************************************************************************
  FLOW PROCESS FROM NODE  11621.00 TO NODE  11622.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2486.90  DOWNSTREAM(FEET) =   2424.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   712.48   CHANNEL SLOPE =  0.0870
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.660
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.63      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.04
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   3.90
  Tc(MIN.) =   12.29
  SUBAREA AREA(ACRES) =     3.63       SUBAREA RUNOFF(CFS) =    3.79
  EFFECTIVE AREA(ACRES) =      4.32     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.3         PEAK FLOW RATE(CFS) =       4.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   3.38
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11622.00 =     979.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11622.00 TO NODE  11623.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2424.91  DOWNSTREAM(FEET) =   2351.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.46   CHANNEL SLOPE =  0.0751
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```



```
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.305
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.42      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.85
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   4.23
  Tc(MIN.) =   16.52
  SUBAREA AREA(ACRES) =    13.42       SUBAREA RUNOFF(CFS) =    9.72
  EFFECTIVE AREA(ACRES) =     17.74     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.7         PEAK FLOW RATE(CFS) =      12.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.01   FLOW VELOCITY(FEET/SEC.) =   4.18
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11623.00 =    1956.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11623.00 TO NODE  11624.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2351.48  DOWNSTREAM(FEET) =   2317.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.96   CHANNEL SLOPE =  0.0355
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.133
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.02      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.39
  AVERAGE FLOW DEPTH(FEET) =   1.31   TRAVEL TIME(MIN.) =   4.66
  Tc(MIN.) =   21.18
  SUBAREA AREA(ACRES) =    16.02       SUBAREA RUNOFF(CFS) =    9.13
  EFFECTIVE AREA(ACRES) =     33.76     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.8         PEAK FLOW RATE(CFS) =      19.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =   3.49
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.00 =    2904.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.00 TO NODE  11624.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2317.87  DOWNSTREAM(FEET) =   2292.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   758.23   CHANNEL SLOPE =  0.0337
```

```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.028
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.93      0.50     0.984     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.72
  AVERAGE FLOW DEPTH(FEET) =   1.56   TRAVEL TIME(MIN.) =   3.40
  Tc(MIN.) =   24.58
  SUBAREA AREA(ACRES) =    32.93       SUBAREA RUNOFF(CFS) =   15.88
  EFFECTIVE AREA(ACRES) =     66.69     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =      31.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.66   FLOW VELOCITY(FEET/SEC.) =   3.87
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.50 =    3662.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.50 TO NODE  11625.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2292.33  DOWNSTREAM(FEET) =   2256.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1098.98   CHANNEL SLOPE =  0.0325
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.924
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       48.16      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.07
  AVERAGE FLOW DEPTH(FEET) =   1.84   TRAVEL TIME(MIN.) =   4.50
  Tc(MIN.) =   29.08
  SUBAREA AREA(ACRES) =    48.16       SUBAREA RUNOFF(CFS) =   18.39
  EFFECTIVE AREA(ACRES) =    114.85     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.9         PEAK FLOW RATE(CFS) =      44.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.88   FLOW VELOCITY(FEET/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11625.00 =    4761.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11625.00 TO NODE  11626.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   2256.59  DOWNSTREAM(FEET) =   2104.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.93   CHANNEL SLOPE =  0.0739
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.850
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.15      0.50     0.950     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.950
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      80.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.54
  AVERAGE FLOW DEPTH(FEET) =   2.02   TRAVEL TIME(MIN.) =   5.24
  Tc(MIN.) =   34.32
  SUBAREA AREA(ACRES) =   212.15       SUBAREA RUNOFF(CFS) =   71.65
  EFFECTIVE AREA(ACRES) =    327.00     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      327.0         PEAK FLOW RATE(CFS) =     108.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.26   FLOW VELOCITY(FEET/SEC.) =   7.05
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11626.00 =    6818.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11626.00 TO NODE  11627.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2104.66  DOWNSTREAM(FEET) =   1837.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2716.08   CHANNEL SLOPE =  0.0985
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.782
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.74      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     126.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.16
  AVERAGE FLOW DEPTH(FEET) =   2.28   TRAVEL TIME(MIN.) =   5.55
  Tc(MIN.) =   39.86
  SUBAREA AREA(ACRES) =   147.74       SUBAREA RUNOFF(CFS) =   37.43
  EFFECTIVE AREA(ACRES) =    474.74     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      474.7         PEAK FLOW RATE(CFS) =     125.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.26   FLOW VELOCITY(FEET/SEC.) =   8.15
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11627.00 =    9534.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11627.00 TO NODE  11628.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1837.03  DOWNSTREAM(FEET) =   1393.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2077.86   CHANNEL SLOPE =  0.2132
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.756
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      202.44      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     148.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.36
  AVERAGE FLOW DEPTH(FEET) =   2.09   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   42.91
  SUBAREA AREA(ACRES) =   202.44       SUBAREA RUNOFF(CFS) =   46.52
  EFFECTIVE AREA(ACRES) =    677.18     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      677.2          PEAK FLOW RATE(CFS) =     160.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.15   FLOW VELOCITY(FEET/SEC.) =  11.60
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11628.00 =   11612.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11628.00 TO NODE  11629.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1393.93  DOWNSTREAM(FEET) =   1201.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2844.34   CHANNEL SLOPE =  0.0676
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.704
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.55      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     173.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.69
  AVERAGE FLOW DEPTH(FEET) =   2.74   TRAVEL TIME(MIN.) =   6.17
  Tc(MIN.) =   49.08
  SUBAREA AREA(ACRES) =   141.55       SUBAREA RUNOFF(CFS) =   25.93
  EFFECTIVE AREA(ACRES) =    818.73     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      818.7          PEAK FLOW RATE(CFS) =     160.63
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.67   FLOW VELOCITY(FEET/SEC.) =   7.54
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11629.00 =   14456.96 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1201.61  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3807.89   CHANNEL SLOPE =  0.0870
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.657
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      106.41      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     168.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.36
  AVERAGE FLOW DEPTH(FEET) =   2.59   TRAVEL TIME(MIN.) =   7.59
  Tc(MIN.) =   56.67
  SUBAREA AREA(ACRES) =   106.41       SUBAREA RUNOFF(CFS) =   14.98
  EFFECTIVE AREA(ACRES) =    925.14     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      925.1          PEAK FLOW RATE(CFS) =     160.63
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.54   FLOW VELOCITY(FEET/SEC.) =   8.28
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11630.00 =   18264.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   56.67
  RAINFALL INTENSITY(INCH/HR) =   0.66
  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     925.14
  TOTAL STREAM AREA(ACRES) =     925.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     160.63

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      272.75   63.20    0.626  0.50( 0.50) 1.00    2278.7   11600.00
      2      160.63   56.67    0.657  0.50( 0.49) 0.99     925.1   11620.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	433.38	56.67	0.657	0.50(0.50)	1.00	2968.4	11620.00
2	403.31	63.20	0.626	0.50(0.50)	1.00	3203.8	11600.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 433.38 Tc(MIN.) = 56.67
EFFECTIVE AREA(ACRES) = 2968.45 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3203.8
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11630.00 = 24493.64 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 3203.8 TC(MIN.) = 56.67
EFFECTIVE AREA(ACRES) = 2968.45 AREA-AVERAGED Fm(INCH/HR)= 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.996
PEAK FLOW RATE(CFS) = 433.38

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	433.38	56.67	0.657	0.50(0.50)	1.00	2968.4	11620.00
2	403.31	63.20	0.626	0.50(0.50)	1.00	3203.8	11600.00

==========

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S17.DAT
  TIME/DATE OF STUDY: 10:37 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.911
   2)   10.00;  1.910
   3)   15.00;  1.364
   4)   20.00;  1.170
   5)   25.00;  1.015
   6)   30.00;  0.904
   7)   40.00;  0.780
   8)   50.00;  0.696
   9)   60.00;  0.637
  10)   90.00;  0.536
  11)  120.00;  0.480
  12)  180.00;  0.407
  13)  360.00;  0.307
  14) 1440.00;  0.137
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11701.00 TO NODE  11702.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   291.79
  ELEVATION DATA: UPSTREAM(FEET) =   1581.05  DOWNSTREAM(FEET) =   1496.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.753
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.160
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.72      0.50     1.000     0    8.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.06
  TOTAL AREA(ACRES) =      2.72   PEAK FLOW RATE(CFS) =      4.06

**************************************************************************
  FLOW PROCESS FROM NODE  11702.00 TO NODE  11703.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1496.25  DOWNSTREAM(FEET) =   1254.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   563.54   CHANNEL SLOPE =  0.4293
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.914
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.12      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.67
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   1.22
  Tc(MIN.) =    9.98
  SUBAREA AREA(ACRES) =    10.12       SUBAREA RUNOFF(CFS) =   12.88
  EFFECTIVE AREA(ACRES) =     12.84     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.8         PEAK FLOW RATE(CFS) =      16.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   8.55
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11703.00 =     855.33 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11703.00 TO NODE  11704.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1254.33  DOWNSTREAM(FEET) =   1143.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.91   CHANNEL SLOPE =  0.1076
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.586
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.71
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   12.97
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   21.02
  EFFECTIVE AREA(ACRES) =     34.36     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.4         PEAK FLOW RATE(CFS) =      33.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =   6.04
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11704.00 =    1881.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11704.00 TO NODE  11705.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1143.91  DOWNSTREAM(FEET) =    804.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1952.20   CHANNEL SLOPE =  0.1737
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.286
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.19      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.04
  AVERAGE FLOW DEPTH(FEET) =   1.46   TRAVEL TIME(MIN.) =   4.05
  Tc(MIN.) =   17.02
  SUBAREA AREA(ACRES) =    50.19       SUBAREA RUNOFF(CFS) =   35.49
  EFFECTIVE AREA(ACRES) =     84.55     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       84.6         PEAK FLOW RATE(CFS) =      59.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.54   FLOW VELOCITY(FEET/SEC.) =   8.36
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11705.00 =    3833.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    804.90  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1056.71   CHANNEL SLOPE =  0.0753
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.176
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.89      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.25
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   2.82
  Tc(MIN.) =   19.83
  SUBAREA AREA(ACRES) =    15.89       SUBAREA RUNOFF(CFS) =    9.67
  EFFECTIVE AREA(ACRES) =    100.44     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.4          PEAK FLOW RATE(CFS) =      61.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.82   FLOW VELOCITY(FEET/SEC.) =   6.16
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S16.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      433.38   56.67  0.50( 0.50) 1.00    2968.4   11620.00
      2      403.31   63.20  0.50( 0.50) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =     3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      433.38   56.67  0.50( 0.50) 1.00    2968.4   11620.00
      2      403.31   63.20  0.50( 0.50) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =      3203.8
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11721.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.22  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3507.54   CHANNEL SLOPE =  0.0413
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.624
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      213.50      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     445.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.08
  AVERAGE FLOW DEPTH(FEET) =   4.28   TRAVEL TIME(MIN.) =   7.23
  Tc(MIN.) =   63.90
  SUBAREA AREA(ACRES) =   213.50       SUBAREA RUNOFF(CFS) =   23.76
  EFFECTIVE AREA(ACRES) =   3181.95     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3417.3         PEAK FLOW RATE(CFS) =     433.38
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.24   FLOW VELOCITY(FEET/SEC.) =   8.02
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      433.38   63.90    0.624  0.50( 0.50) 1.00    3181.9   11620.00
      2      403.31   70.58    0.601  0.50( 0.50) 1.00    3417.3   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       61.13   19.83    1.176  0.50( 0.50) 1.00     100.4   11701.00
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      494.51   19.83    1.176  0.50( 0.50) 1.00    1088.1   11701.00
      2      444.56   63.90    0.624  0.50( 0.50) 1.00    3282.4   11620.00
      3      412.46   70.58    0.601  0.50( 0.50) 1.00    3517.8   11600.00
    TOTAL AREA(ACRES) =      3517.8
```



```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      494.51  Tc(MIN.) =   19.834
  EFFECTIVE AREA(ACRES) =   1088.07  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3517.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11721.00 TO NODE  11722.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    725.34  DOWNSTREAM(FEET) =    657.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1845.27   CHANNEL SLOPE =  0.0367
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.057
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      185.10      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     540.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.10
  AVERAGE FLOW DEPTH(FEET) =   4.72   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   23.63
  SUBAREA AREA(ACRES) =   185.10       SUBAREA RUNOFF(CFS) =   92.83
  EFFECTIVE AREA(ACRES) =   1273.17     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3702.9         PEAK FLOW RATE(CFS) =     640.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.02   FLOW VELOCITY(FEET/SEC.) =   8.46
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11722.00 =   29846.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11722.00 TO NODE  11723.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.70  DOWNSTREAM(FEET) =    609.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1967.44   CHANNEL SLOPE =  0.0245
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.947
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      273.16      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     695.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
  AVERAGE FLOW DEPTH(FEET) =   5.59   TRAVEL TIME(MIN.) =   4.42
  Tc(MIN.) =   28.05
```

```
  SUBAREA AREA(ACRES) =   273.16       SUBAREA RUNOFF(CFS) =  109.92
  EFFECTIVE AREA(ACRES) =   1546.33     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3976.0         PEAK FLOW RATE(CFS) =     640.06
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.42   FLOW VELOCITY(FEET/SEC.) =   7.26
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11723.00 =   31813.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11723.00 TO NODE  11724.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    609.57  DOWNSTREAM(FEET) =    546.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2808.53   CHANNEL SLOPE =  0.0224
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.846
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      159.72      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     664.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.09
  AVERAGE FLOW DEPTH(FEET) =   5.59   TRAVEL TIME(MIN.) =   6.60
  Tc(MIN.) =   34.65
  SUBAREA AREA(ACRES) =   159.72       SUBAREA RUNOFF(CFS) =   49.76
  EFFECTIVE AREA(ACRES) =   1706.05     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4135.8         PEAK FLOW RATE(CFS) =     640.06
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.51   FLOW VELOCITY(FEET/SEC.) =   7.02
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11724.00 =   34622.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11724.00 TO NODE  11725.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    546.77  DOWNSTREAM(FEET) =    483.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2921.33   CHANNEL SLOPE =  0.0216
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.766
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.67      0.50      0.917     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     658.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.99
  AVERAGE FLOW DEPTH(FEET) =   5.60   TRAVEL TIME(MIN.) =   6.97
  Tc(MIN.) =   41.61
  SUBAREA AREA(ACRES) =   134.67       SUBAREA RUNOFF(CFS) =   37.30
  EFFECTIVE AREA(ACRES) =   1840.72     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4270.4         PEAK FLOW RATE(CFS) =     640.06
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.55   FLOW VELOCITY(FEET/SEC.) =   6.93
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11725.00 =   37543.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    483.75  DOWNSTREAM(FEET) =    436.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2685.66   CHANNEL SLOPE =  0.0177
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.708
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      121.44      0.50     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     651.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.47
  AVERAGE FLOW DEPTH(FEET) =   5.80   TRAVEL TIME(MIN.) =   6.92
  Tc(MIN.) =   48.53
  SUBAREA AREA(ACRES) =   121.44       SUBAREA RUNOFF(CFS) =   23.51
  EFFECTIVE AREA(ACRES) =   1962.16     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4391.9         PEAK FLOW RATE(CFS) =     640.06
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.76   FLOW VELOCITY(FEET/SEC.) =   6.44
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     4391.9  TC(MIN.) =     48.53
  EFFECTIVE AREA(ACRES) =   1962.16  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.992
  PEAK FLOW RATE(CFS)   =     640.06

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      640.06   48.53    0.708  0.50( 0.50) 0.99    1962.2   11701.00
      2      444.56   95.33    0.526  0.50( 0.50) 0.99    4156.5   11620.00
      3      412.46  102.61    0.512  0.50( 0.50) 0.99    4391.9   11600.00
============================================================================
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S18.DAT
  TIME/DATE OF STUDY: 14:04 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.889
   2)   10.00;  1.897
   3)   15.00;  1.359
   4)   20.00;  1.165
   5)   25.00;  1.012
   6)   30.00;  0.902
   7)   40.00;  0.777
   8)   50.00;  0.694
   9)   60.00;  0.634
  10)   90.00;  0.533
  11)  120.00;  0.477
  12)  180.00;  0.404
  13)  360.00;  0.304
  14) 1440.00;  0.135
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11801.00 TO NODE  11802.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   970.31
  ELEVATION DATA: UPSTREAM(FEET) =    834.89  DOWNSTREAM(FEET) =    727.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.170
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.275
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        7.24      0.50     1.000     0   17.17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.05
  TOTAL AREA(ACRES) =      7.24   PEAK FLOW RATE(CFS) =      5.05

**************************************************************************
  FLOW PROCESS FROM NODE  11802.00 TO NODE  11803.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    727.50  DOWNSTREAM(FEET) =    674.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   968.10   CHANNEL SLOPE =  0.0551
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.114
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       22.08      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.59
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   4.50
  Tc(MIN.) =   21.67
  SUBAREA AREA(ACRES) =    22.08       SUBAREA RUNOFF(CFS) =   12.20
  EFFECTIVE AREA(ACRES) =     29.32     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3         PEAK FLOW RATE(CFS) =      16.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   3.93
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11803.00 =    1938.41 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11803.00 TO NODE  11804.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    674.12  DOWNSTREAM(FEET) =    554.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.27   CHANNEL SLOPE =  0.0642
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.936
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.55      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.57
  AVERAGE FLOW DEPTH(FEET) =   1.30   TRAVEL TIME(MIN.) =   6.80
  Tc(MIN.) =   28.47
  SUBAREA AREA(ACRES) =    35.55       SUBAREA RUNOFF(CFS) =   13.93
  EFFECTIVE AREA(ACRES) =     64.87     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       64.9         PEAK FLOW RATE(CFS) =      25.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   4.67
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11804.00 =    3802.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    554.40  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1767.25   CHANNEL SLOPE =  0.0738
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.850
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.70      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.19
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   5.68
  Tc(MIN.) =   34.15
  SUBAREA AREA(ACRES) =    36.70       SUBAREA RUNOFF(CFS) =   11.56
  EFFECTIVE AREA(ACRES) =    101.57     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      101.6         PEAK FLOW RATE(CFS) =      31.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOW VELOCITY(FEET/SEC.) =   5.20
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11821.00 =    5569.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```



```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S15.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     6078.83   42.97  0.50( 0.50) 0.99    6491.8   11500.00
      2     6068.85   45.87  0.50( 0.50) 0.99    7104.8   11530.00
      3     5991.48   54.64  0.50( 0.50) 1.00    8845.8   11000.00
      4     5887.41   71.41  0.50( 0.50) 1.00   13539.7   11330.00
      5     5876.13   72.55  0.50( 0.50) 1.00   13884.0   10850.00
      6     5787.04   76.68  0.50( 0.50) 1.00   15188.1   10900.00
      7     5696.32   79.89  0.50( 0.50) 1.00   16135.1   10830.00
      8     5624.84   81.88  0.50( 0.50) 1.00   16655.4   10910.00
      9     5477.45   84.72  0.50( 0.50) 1.00   17297.8   11130.00
     10     4654.93  100.18  0.50( 0.50) 1.00   20181.1   10600.00
     11     4112.77  112.33  0.50( 0.50) 1.00   22449.8   10500.00
     12     4031.49  114.10  0.50( 0.50) 1.00   22754.9   11201.00
     13     3593.79  120.88  0.50( 0.50) 1.00   23582.7   10710.00
     14     3487.77  122.89  0.50( 0.50) 1.00   23781.2   10410.00
     15     2989.78  132.58  0.50( 0.50) 1.00   24605.4   10700.00
     16     2562.41  141.37  0.50( 0.50) 1.00   25278.0   10400.00
     17     2208.84  149.16  0.50( 0.50) 1.00   25768.4   10200.00
     18     1821.50  162.51  0.50( 0.50) 1.00   26497.8   10300.00
     19     1663.63  168.53  0.50( 0.50) 1.00   26628.8   10210.00
     20      537.36  246.21  0.50( 0.50) 1.00   27497.1   10100.00
    TOTAL AREA(ACRES) =    27497.1

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S17.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      640.06   48.53  0.50( 0.50) 0.99    1962.2   11701.00
      2      444.56   95.33  0.50( 0.50) 0.99    4156.5   11620.00
      3      412.46  102.61  0.50( 0.50) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =     4391.9

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      640.06   48.53  0.50( 0.50) 0.99    1962.2   11701.00
      2      444.56   95.33  0.50( 0.50) 0.99    4156.5   11620.00
```

```
      3      412.46  102.61  0.50( 0.50) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =      4391.9

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      640.06   48.53    0.706  0.50( 0.50) 0.99    1962.2   11701.00
      2      444.56   95.33    0.523  0.50( 0.50) 0.99    4156.5   11620.00
      3      412.46  102.61    0.509  0.50( 0.50) 0.99    4391.9   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6078.83   42.97    0.752  0.50( 0.50) 0.99    6491.8   11500.00
      2     6068.85   45.87    0.728  0.50( 0.50) 0.99    7104.8   11530.00
      3     5991.48   54.64    0.666  0.50( 0.50) 1.00    8845.8   11000.00
      4     5887.41   71.41    0.596  0.50( 0.50) 1.00   13539.7   11330.00
      5     5876.13   72.55    0.592  0.50( 0.50) 1.00   13884.0   10850.00
      6     5787.04   76.68    0.578  0.50( 0.50) 1.00   15188.1   10900.00
      7     5696.32   79.89    0.567  0.50( 0.50) 1.00   16135.1   10830.00
      8     5624.84   81.88    0.560  0.50( 0.50) 1.00   16655.4   10910.00
      9     5477.45   84.72    0.551  0.50( 0.50) 1.00   17297.8   11130.00
     10     4654.93  100.18    0.514  0.50( 0.50) 1.00   20181.1   10600.00
     11     4112.77  112.33    0.491  0.50( 0.50) 1.00   22449.8   10500.00
     12     4031.49  114.10    0.488  0.50( 0.50) 1.00   22754.9   11201.00
     13     3593.79  120.88    0.476  0.50( 0.50) 1.00   23582.7   10710.00
     14     3487.77  122.89    0.473  0.50( 0.50) 1.00   23781.2   10410.00
     15     2989.78  132.58    0.462  0.50( 0.50) 1.00   24605.4   10700.00
     16     2562.41  141.37    0.451  0.50( 0.50) 1.00   25278.0   10400.00
     17     2208.84  149.16    0.442  0.50( 0.50) 1.00   25768.4   10200.00
     18     1821.50  162.51    0.425  0.50( 0.50) 1.00   26497.8   10300.00
     19     1663.63  168.53    0.418  0.50( 0.50) 1.00   26628.8   10210.00
     20      537.36  246.21    0.367  0.50( 0.50) 1.00   27497.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6718.89   42.97    0.752  0.50( 0.50) 0.99    8229.2   11500.00
      2     6708.91   45.87    0.728  0.50( 0.50) 0.99    8959.1   11530.00
      3     6685.41   48.53    0.706  0.50( 0.50) 0.99    9595.9   11701.00
      4     6606.02   54.64    0.666  0.50( 0.50) 0.99   11094.4   11000.00
      5     6431.89   71.41    0.596  0.50( 0.50) 1.00   16574.7   11330.00
      6     6415.86   72.55    0.592  0.50( 0.50) 1.00   16972.3   10850.00
      7     6309.51   76.68    0.578  0.50( 0.50) 1.00   18470.2   10900.00
      8     6205.37   79.89    0.567  0.50( 0.50) 1.00   19567.8   10830.00
      9     6125.60   81.88    0.560  0.50( 0.50) 1.00   20181.0   10910.00
     10     5966.31   84.72    0.551  0.50( 0.50) 1.00   20956.9   11130.00
     11     5357.48   95.33    0.523  0.50( 0.50) 1.00   23433.2   11620.00
     12     5078.11  100.18    0.514  0.50( 0.50) 1.00   24494.3   10600.00
     13     4958.99  102.61    0.509  0.50( 0.50) 1.00   25026.6   11600.00
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     14     4205.04  112.33    0.491  0.50( 0.50) 1.00   26841.6   10500.00
     15     4123.14  114.10    0.488  0.50( 0.50) 1.00   27146.8   11201.00
     16     3683.17  120.88    0.476  0.50( 0.50) 1.00   27974.6   10710.00
     17     3576.69  122.89    0.473  0.50( 0.50) 1.00   28173.1   10410.00
     18     3076.49  132.58    0.462  0.50( 0.50) 1.00   28997.2   10700.00
     19     2647.11  141.37    0.451  0.50( 0.50) 1.00   29669.9   10400.00
     20     2291.75  149.16    0.442  0.50( 0.50) 1.00   30160.3   10200.00
     21     1901.37  162.51    0.425  0.50( 0.50) 1.00   30889.7   10300.00
     22     1742.13  168.53    0.418  0.50( 0.50) 1.00   31020.6   10210.00
     23      606.32  246.21    0.367  0.50( 0.50) 1.00   31889.0   10100.00
   TOTAL AREA(ACRES) =     31889.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     6718.89  Tc(MIN.) =   42.975
  EFFECTIVE AREA(ACRES) =   8229.24  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    31889.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11726.00 TO NODE  11821.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.21  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1621.39   CHANNEL SLOPE =  0.0076
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.733
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.69      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6725.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.43
  AVERAGE FLOW DEPTH(FEET) =  14.00   TRAVEL TIME(MIN.) =   2.36
  Tc(MIN.) =   45.34
  SUBAREA AREA(ACRES) =    59.69       SUBAREA RUNOFF(CFS) =   12.49
  EFFECTIVE AREA(ACRES) =   8288.93     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    31948.7         PEAK FLOW RATE(CFS) =    6718.89
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 14.00   FLOW VELOCITY(FEET/SEC.) =  11.42
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11821.00 =   90744.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	6718.89	45.34	0.733	0.50(0.50)	0.99	8288.9	11500.00
2	6708.91	48.23	0.709	0.50(0.50)	0.99	9018.8	11530.00
3	6685.41	50.90	0.689	0.50(0.50)	0.99	9655.5	11701.00
4	6606.02	57.02	0.652	0.50(0.50)	0.99	11154.1	11000.00
5	6431.89	73.80	0.588	0.50(0.50)	1.00	16634.4	11330.00
6	6415.86	74.94	0.584	0.50(0.50)	1.00	17032.0	10850.00
7	6309.51	79.08	0.570	0.50(0.50)	1.00	18529.9	10900.00
8	6205.37	82.30	0.559	0.50(0.50)	1.00	19627.5	10830.00
9	6125.60	84.30	0.552	0.50(0.50)	1.00	20240.7	10910.00
10	5966.31	87.16	0.543	0.50(0.50)	1.00	21016.6	11130.00
11	5357.48	97.83	0.518	0.50(0.50)	1.00	23492.8	11620.00
12	5078.11	102.71	0.509	0.50(0.50)	1.00	24554.0	10600.00
13	4958.99	105.16	0.505	0.50(0.50)	1.00	25086.2	11600.00
14	4205.04	114.99	0.486	0.50(0.50)	1.00	26901.3	10500.00
15	4123.14	116.77	0.483	0.50(0.50)	1.00	27206.5	11201.00
16	3683.17	123.63	0.473	0.50(0.50)	1.00	28034.3	10710.00
17	3576.69	125.66	0.470	0.50(0.50)	1.00	28232.8	10410.00
18	3076.49	135.46	0.458	0.50(0.50)	1.00	29056.9	10700.00
19	2647.11	144.36	0.447	0.50(0.50)	1.00	29729.5	10400.00
20	2291.75	152.26	0.438	0.50(0.50)	1.00	30220.0	10200.00
21	1901.37	165.75	0.421	0.50(0.50)	1.00	30949.4	10300.00
22	1742.13	171.84	0.414	0.50(0.50)	1.00	31080.3	10210.00
23	606.32	250.53	0.365	0.50(0.50)	1.00	31948.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.99	34.15	0.850	0.50(0.50)	1.00	101.6	11801.00

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6750.88	34.15	0.850	0.50(0.50)	0.99	6344.1	11801.00
2	6740.14	45.34	0.733	0.50(0.50)	0.99	8390.5	11500.00
3	6727.97	48.23	0.709	0.50(0.50)	0.99	9120.4	11530.00
4	6702.63	50.90	0.689	0.50(0.50)	0.99	9757.1	11701.00
5	6619.89	57.02	0.652	0.50(0.50)	0.99	11255.7	11000.00
6	6439.87	73.80	0.588	0.50(0.50)	1.00	16735.9	11330.00
7	6423.50	74.94	0.584	0.50(0.50)	1.00	17133.6	10850.00
8	6315.86	79.08	0.570	0.50(0.50)	1.00	18631.5	10900.00
9	6210.74	82.30	0.559	0.50(0.50)	1.00	19729.0	10830.00
10	6130.35	84.30	0.552	0.50(0.50)	1.00	20342.3	10910.00
11	5970.19	87.16	0.543	0.50(0.50)	1.00	21118.2	11130.00
12	5359.14	97.83	0.518	0.50(0.50)	1.00	23594.4	11620.00
13	5078.93	102.71	0.509	0.50(0.50)	1.00	24655.6	10600.00
14	4959.40	105.16	0.505	0.50(0.50)	1.00	25187.8	11600.00
15	4205.04	114.99	0.486	0.50(0.50)	1.00	27002.9	10500.00
16	4123.14	116.77	0.483	0.50(0.50)	1.00	27308.1	11201.00
17	3683.17	123.63	0.473	0.50(0.50)	1.00	28135.9	10710.00
18	3576.69	125.66	0.470	0.50(0.50)	1.00	28334.4	10410.00
19	3076.48	135.46	0.458	0.50(0.50)	1.00	29158.5	10700.00
20	2647.10	144.36	0.447	0.50(0.50)	1.00	29831.1	10400.00
21	2291.75	152.26	0.438	0.50(0.50)	1.00	30321.6	10200.00
22	1901.37	165.75	0.421	0.50(0.50)	1.00	31051.0	10300.00
23	1742.13	171.84	0.414	0.50(0.50)	1.00	31181.9	10210.00

24	606.32	250.53	0.365	0.50(0.50)	1.00	32050.3	10100.00

TOTAL AREA(ACRES) = 32050.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 6750.88 Tc(MIN.) = 34.146
EFFECTIVE AREA(ACRES) = 6344.14 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32050.3
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 423.93 DOWNSTREAM(FEET) = 402.38
CHANNEL LENGTH THRU SUBAREA(FEET) = 1912.90 CHANNEL SLOPE = 0.0113
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.820
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.91	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6779.96
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.29
AVERAGE FLOW DEPTH(FEET) = 13.04 TRAVEL TIME(MIN.) = 2.40
Tc(MIN.) = 36.55
SUBAREA AREA(ACRES) = 201.91 SUBAREA RUNOFF(CFS) = 58.15
EFFECTIVE AREA(ACRES) = 6546.05 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 32252.2 PEAK FLOW RATE(CFS) = 6750.88
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 13.02 FLOW VELOCITY(FEET/SEC.) = 13.27
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11822.00 = 92657.60 FEET.

****
FLOW PROCESS FROM NODE 11822.00 TO NODE 11841.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 402.38 DOWNSTREAM(FEET) = 380.74
CHANNEL LENGTH THRU SUBAREA(FEET) = 2380.10 CHANNEL SLOPE = 0.0091
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.780
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.13	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6765.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.25
  AVERAGE FLOW DEPTH(FEET) =  13.57   TRAVEL TIME(MIN.) =   3.24
  Tc(MIN.) =   39.78
  SUBAREA AREA(ACRES) =   116.13       SUBAREA RUNOFF(CFS) =   29.21
  EFFECTIVE AREA(ACRES) =   6662.18     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    32368.3         PEAK FLOW RATE(CFS) =    6750.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.55   FLOW VELOCITY(FEET/SEC.) =  12.25
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   39.78
  RAINFALL INTENSITY(INCH/HR) =   0.78
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =    6662.18
  TOTAL STREAM AREA(ACRES) =   32368.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    6750.88

****************************************************************************
  FLOW PROCESS FROM NODE  11831.00 TO NODE  11832.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.20
  ELEVATION DATA: UPSTREAM(FEET) =   1353.30  DOWNSTREAM(FEET) =   1280.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.179
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.258
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"               -        0.76      0.50     1.000     0    8.18
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.20
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      1.20

****************************************************************************
  FLOW PROCESS FROM NODE  11832.00 TO NODE  11833.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   1280.02  DOWNSTREAM(FEET) =   1070.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   686.67   CHANNEL SLOPE =  0.3057
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.869
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.95      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.51
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   2.08
  Tc(MIN.) =   10.26
  SUBAREA AREA(ACRES) =     5.95       SUBAREA RUNOFF(CFS) =    7.33
  EFFECTIVE AREA(ACRES) =      6.71     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =       8.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   6.31
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11833.00 =     934.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11833.00 TO NODE  11834.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1070.08  DOWNSTREAM(FEET) =    913.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.36   CHANNEL SLOPE =  0.1601
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.585
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.21      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.15
  AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   2.65
  Tc(MIN.) =   12.90
  SUBAREA AREA(ACRES) =    23.21       SUBAREA RUNOFF(CFS) =   22.65
  EFFECTIVE AREA(ACRES) =     29.92     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.9         PEAK FLOW RATE(CFS) =      29.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   6.82
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11834.00 =    1912.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11834.00 TO NODE  11835.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
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```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    913.56  DOWNSTREAM(FEET) =    727.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.63   CHANNEL SLOPE =  0.0989
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.257
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.73      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.61
  AVERAGE FLOW DEPTH(FEET) =   1.66   TRAVEL TIME(MIN.) =   4.73
  Tc(MIN.) =   17.63
  SUBAREA AREA(ACRES) =    73.73       SUBAREA RUNOFF(CFS) =   50.22
  EFFECTIVE AREA(ACRES) =    103.65     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      103.7         PEAK FLOW RATE(CFS) =      70.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =   7.06
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11835.00 =    3787.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11835.00 TO NODE  11836.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    727.99  DOWNSTREAM(FEET) =    611.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.64   CHANNEL SLOPE =  0.0615
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.086
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       93.31      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      95.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.37
  AVERAGE FLOW DEPTH(FEET) =   2.23   TRAVEL TIME(MIN.) =   4.96
  Tc(MIN.) =   22.59
  SUBAREA AREA(ACRES) =    93.31       SUBAREA RUNOFF(CFS) =   49.17
  EFFECTIVE AREA(ACRES) =    196.96     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      197.0         PEAK FLOW RATE(CFS) =     103.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.31   FLOW VELOCITY(FEET/SEC.) =   6.50
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11836.00 =    5684.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11836.00 TO NODE  11837.00 IS CODE =  51
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    611.39  DOWNSTREAM(FEET) =    508.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2178.15   CHANNEL SLOPE =  0.0472
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.935
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.92      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     123.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.16
  AVERAGE FLOW DEPTH(FEET) =   2.58   TRAVEL TIME(MIN.) =   5.89
  Tc(MIN.) =   28.48
  SUBAREA AREA(ACRES) =    98.92       SUBAREA RUNOFF(CFS) =   38.75
  EFFECTIVE AREA(ACRES) =    295.88     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      295.9         PEAK FLOW RATE(CFS) =     115.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.52   FLOW VELOCITY(FEET/SEC.) =   6.07
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11837.00 =    7862.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11837.00 TO NODE  11838.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    508.59  DOWNSTREAM(FEET) =    448.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1942.91   CHANNEL SLOPE =  0.0309
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.845
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.71      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     128.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.32
  AVERAGE FLOW DEPTH(FEET) =   2.84   TRAVEL TIME(MIN.) =   6.09
  Tc(MIN.) =   34.57
  SUBAREA AREA(ACRES) =    79.71       SUBAREA RUNOFF(CFS) =   24.73
  EFFECTIVE AREA(ACRES) =    375.59     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      375.6         PEAK FLOW RATE(CFS) =     116.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.74   FLOW VELOCITY(FEET/SEC.) =   5.19
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.00 =    9805.56 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11838.00 TO NODE  11838.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    448.50  DOWNSTREAM(FEET) =    420.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =   917.65   CHANNEL SLOPE =  0.0302
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.808
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.57      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.20
  AVERAGE FLOW DEPTH(FEET) =   2.79   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   37.51
  SUBAREA AREA(ACRES) =    34.57       SUBAREA RUNOFF(CFS) =    9.58
  EFFECTIVE AREA(ACRES) =    410.16     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      410.2         PEAK FLOW RATE(CFS) =     116.52
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.75   FLOW VELOCITY(FEET/SEC.) =   5.14
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.50 =   10723.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    420.79  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1615.83   CHANNEL SLOPE =  0.0248
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.751
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.54      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     118.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.80
  AVERAGE FLOW DEPTH(FEET) =   2.87   TRAVEL TIME(MIN.) =   5.61
  Tc(MIN.) =   43.12
  SUBAREA AREA(ACRES) =    21.54       SUBAREA RUNOFF(CFS) =    4.86
  EFFECTIVE AREA(ACRES) =    431.70     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      431.7         PEAK FLOW RATE(CFS) =     116.52
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.85   FLOW VELOCITY(FEET/SEC.) =   4.78
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11841.00 =   12339.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   43.12
  RAINFALL INTENSITY(INCH/HR) =   0.75
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     431.70
  TOTAL STREAM AREA(ACRES) =     431.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     116.52

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     6750.88   39.78    0.780  0.50( 0.50) 0.99    6662.2   11801.00
      1     6740.14   50.98    0.688  0.50( 0.50) 0.99    8708.5   11500.00
      1     6727.97   53.88    0.671  0.50( 0.50) 0.99    9438.4   11530.00
      1     6702.63   56.55    0.655  0.50( 0.50) 0.99   10075.2   11701.00
      1     6619.89   62.68    0.625  0.50( 0.50) 1.00   11573.7   11000.00
      1     6439.87   79.51    0.568  0.50( 0.50) 1.00   17054.0   11330.00
      1     6423.50   80.65    0.564  0.50( 0.50) 1.00   17451.6   10850.00
      1     6315.86   84.82    0.550  0.50( 0.50) 1.00   18949.5   10900.00
      1     6210.74   88.06    0.540  0.50( 0.50) 1.00   20047.1   10830.00
      1     6130.35   90.07    0.533  0.50( 0.50) 1.00   20660.3   10910.00
      1     5970.19   92.98    0.527  0.50( 0.50) 1.00   21436.2   11130.00
      1     5359.14  103.81    0.507  0.50( 0.50) 1.00   23912.5   11620.00
      1     5078.93  108.77    0.498  0.50( 0.50) 1.00   24973.6   10600.00
      1     4959.40  111.25    0.493  0.50( 0.50) 1.00   25505.9   11600.00
      1     4205.04  121.34    0.475  0.50( 0.50) 1.00   27320.9   10500.00
      1     4123.14  123.15    0.473  0.50( 0.50) 1.00   27626.1   11201.00
      1     3683.17  130.19    0.465  0.50( 0.50) 1.00   28453.9   10710.00
      1     3576.69  132.27    0.462  0.50( 0.50) 1.00   28652.4   10410.00
      1     3076.48  142.32    0.450  0.50( 0.50) 1.00   29476.5   10700.00
      1     2647.10  151.49    0.439  0.50( 0.50) 1.00   30149.2   10400.00
      1     2291.75  159.65    0.429  0.50( 0.50) 1.00   30639.6   10200.00
      1     1901.37  173.49    0.412  0.50( 0.50) 1.00   31369.0   10300.00
      1     1742.13  179.76    0.404  0.50( 0.50) 1.00   31499.9   10210.00
      1      606.32  260.83    0.359  0.50( 0.50) 1.00   32368.3   10100.00
      2      116.52   43.12    0.751  0.50( 0.50) 1.00     431.7   11831.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     6867.40   39.78    0.780  0.50( 0.50) 0.99    7060.5   11801.00
      2     6864.20   43.12    0.751  0.50( 0.50) 0.99    7703.5   11831.00
```

3	6827.41	50.98	0.688	0.50(0.50)	0.99	9140.2	11500.00
4	6807.16	53.88	0.671	0.50(0.50)	0.99	9870.1	11530.00
5	6774.38	56.55	0.655	0.50(0.50)	0.99	10506.9	11701.00
6	6677.83	62.68	0.625	0.50(0.50)	1.00	12005.4	11000.00
7	6471.50	79.51	0.568	0.50(0.50)	1.00	17485.7	11330.00
8	6453.34	80.65	0.564	0.50(0.50)	1.00	17883.3	10850.00
9	6339.19	84.82	0.550	0.50(0.50)	1.00	19381.2	10900.00
10	6228.99	88.06	0.540	0.50(0.50)	1.00	20478.8	10830.00
11	6145.52	90.07	0.533	0.50(0.50)	1.00	21092.0	10910.00
12	5982.84	92.98	0.527	0.50(0.50)	1.00	21867.9	11130.00
13	5362.41	103.81	0.507	0.50(0.50)	1.00	24344.2	11620.00
14	5078.93	108.77	0.498	0.50(0.50)	1.00	25405.3	10600.00
15	4959.40	111.25	0.493	0.50(0.50)	1.00	25937.6	11600.00
16	4205.04	121.34	0.475	0.50(0.50)	1.00	27752.6	10500.00
17	4123.14	123.15	0.473	0.50(0.50)	1.00	28057.8	11201.00
18	3683.17	130.19	0.465	0.50(0.50)	1.00	28885.6	10710.00
19	3576.69	132.27	0.462	0.50(0.50)	1.00	29084.1	10410.00
20	3076.48	142.32	0.450	0.50(0.50)	1.00	29908.2	10700.00
21	2647.10	151.49	0.439	0.50(0.50)	1.00	30580.9	10400.00
22	2291.75	159.65	0.429	0.50(0.50)	1.00	31071.3	10200.00
23	1901.37	173.49	0.412	0.50(0.50)	1.00	31800.7	10300.00
24	1742.13	179.76	0.404	0.50(0.50)	1.00	31931.6	10210.00
25	606.32	260.83	0.359	0.50(0.50)	1.00	32800.0	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 6867.40 Tc(MIN.) = 39.78
EFFECTIVE AREA(ACRES) = 7060.49 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 32800.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11841.00 = 95037.70 FEET.

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 380.74 DOWNSTREAM(FEET) = 347.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 2830.43 CHANNEL SLOPE = 0.0118
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.750
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.59	0.50	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6880.58
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.55
AVERAGE FLOW DEPTH(FEET) = 13.01 TRAVEL TIME(MIN.) = 3.48
Tc(MIN.) = 43.27
SUBAREA AREA(ACRES) = 116.59 SUBAREA RUNOFF(CFS) = 26.36
EFFECTIVE AREA(ACRES) = 7177.08 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 32916.6 PEAK FLOW RATE(CFS) = 6867.40
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 13.00 FLOW VELOCITY(FEET/SEC.) = 13.55
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.
==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 43.27
EFFECTIVE AREA(ACRES) = 7177.08 AREA-AVERAGED Fm(INCH/HR)= 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.995
PEAK FLOW RATE(CFS) = 6867.40

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6867.40	43.27	0.750	0.50(0.50)	0.99	7177.1	11801.00
2	6864.20	46.60	0.722	0.50(0.50)	0.99	7820.1	11831.00
3	6827.41	54.47	0.667	0.50(0.50)	0.99	9256.8	11500.00
4	6807.16	57.37	0.650	0.50(0.50)	0.99	9986.7	11530.00
5	6774.38	60.04	0.634	0.50(0.50)	0.99	10623.4	11701.00
6	6677.83	66.19	0.613	0.50(0.50)	1.00	12122.0	11000.00
7	6471.50	83.04	0.556	0.50(0.50)	1.00	17602.3	11330.00
8	6453.34	84.19	0.553	0.50(0.50)	1.00	17999.9	10850.00
9	6339.19	88.37	0.538	0.50(0.50)	1.00	19497.8	10900.00
10	6228.99	91.63	0.530	0.50(0.50)	1.00	20595.4	10830.00
11	6145.52	93.65	0.526	0.50(0.50)	1.00	21208.6	10910.00
12	5982.84	96.58	0.521	0.50(0.50)	1.00	21984.5	11130.00
13	5362.41	107.51	0.500	0.50(0.50)	1.00	24460.7	11620.00
14	5078.93	112.52	0.491	0.50(0.50)	1.00	25521.9	10600.00
15	4959.40	115.03	0.486	0.50(0.50)	1.00	26054.1	11600.00
16	4205.04	125.28	0.471	0.50(0.50)	1.00	27869.2	10500.00
17	4123.14	127.11	0.468	0.50(0.50)	1.00	28174.4	11201.00
18	3683.17	134.26	0.460	0.50(0.50)	1.00	29002.2	10710.00
19	3576.69	136.37	0.457	0.50(0.50)	1.00	29200.7	10410.00
20	3076.48	146.58	0.445	0.50(0.50)	1.00	30024.8	10700.00
21	2647.10	155.91	0.433	0.50(0.50)	1.00	30697.4	10400.00
22	2291.75	164.23	0.423	0.50(0.50)	1.00	31187.9	10200.00
23	1901.37	178.29	0.406	0.50(0.50)	1.00	31917.3	10300.00
24	1742.13	184.66	0.401	0.50(0.50)	1.00	32048.2	10210.00
25	606.32	267.22	0.356	0.50(0.50)	1.00	32916.6	10100.00

==========
==========
END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                        Analysis prepared by:

                      Michael Baker International
                    5 Hutton Centre Drive, Suite 500
                             Santa Ana, CA
                                 92707

------------------------------------------------------------------------
  FILE NAME: S19.DAT
  TIME/DATE OF STUDY: 11:00 07/17/2018
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.749
   2)   10.00;  1.820
   3)   15.00;  1.328
   4)   20.00;  1.137
   5)   25.00;  0.990
   6)   30.00;  0.887
   7)   40.00;  0.760
   8)   50.00;  0.677
   9)   60.00;  0.617
  10)   90.00;  0.514
  11)  120.00;  0.456
  12)  180.00;  0.384
  13)  360.00;  0.286
  14) 1200.00;  0.126
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11900.00 TO NODE  11901.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.79
  ELEVATION DATA: UPSTREAM(FEET) =   2369.48  DOWNSTREAM(FEET) =   2332.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.203
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.340
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"          -        1.62      0.50     0.999     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  SUBAREA RUNOFF(CFS) =      2.68
  TOTAL AREA(ACRES) =      1.62   PEAK FLOW RATE(CFS) =      2.68

************************************************************************
  FLOW PROCESS FROM NODE  11901.00 TO NODE  11902.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2332.92  DOWNSTREAM(FEET) =   2297.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   664.26   CHANNEL SLOPE =  0.0530
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.757
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.35      0.50     0.906     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.22
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   10.64
  SUBAREA AREA(ACRES) =     8.35       SUBAREA RUNOFF(CFS) =    9.80
  EFFECTIVE AREA(ACRES) =      9.97     AREA-AVERAGED Fm(INCH/HR) =   0.46
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =       10.0         PEAK FLOW RATE(CFS) =      11.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =   3.57
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.00 =     960.05 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11902.00 TO NODE  11902.50 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2297.70  DOWNSTREAM(FEET) =   2263.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.77   CHANNEL SLOPE =  0.0369
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.356
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.48      0.50     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.80
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   4.07
  Tc(MIN.) =   14.71
  SUBAREA AREA(ACRES) =    34.48       SUBAREA RUNOFF(CFS) =   28.06
  EFFECTIVE AREA(ACRES) =     44.45     AREA-AVERAGED Fm(INCH/HR) =   0.45
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.91
  TOTAL AREA(ACRES) =       44.5         PEAK FLOW RATE(CFS) =      36.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =   4.13
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.50 =    1888.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11902.50 TO NODE  11903.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.40  DOWNSTREAM(FEET) =   2252.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   895.50   CHANNEL SLOPE =  0.0126
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.142
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.65      0.50     0.958     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.958
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.89
  AVERAGE FLOW DEPTH(FEET) =   2.23   TRAVEL TIME(MIN.) =   5.17
  Tc(MIN.) =   19.88
  SUBAREA AREA(ACRES) =    23.65       SUBAREA RUNOFF(CFS) =   14.10
  EFFECTIVE AREA(ACRES) =     68.10     AREA-AVERAGED Fm(INCH/HR) =   0.46
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       68.1         PEAK FLOW RATE(CFS) =      41.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.20   FLOW VELOCITY(FEET/SEC.) =   2.86
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11903.00 =    2784.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11903.00 TO NODE  11904.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2252.14  DOWNSTREAM(FEET) =   2186.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.35   CHANNEL SLOPE =  0.0343
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.948
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.53      0.50     0.961     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.961
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.49
  AVERAGE FLOW DEPTH(FEET) =   2.04   TRAVEL TIME(MIN.) =   7.15
  Tc(MIN.) =   27.03
  SUBAREA AREA(ACRES) =    68.53       SUBAREA RUNOFF(CFS) =   28.84
  EFFECTIVE AREA(ACRES) =    136.63     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      136.6         PEAK FLOW RATE(CFS) =      58.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.07   FLOW VELOCITY(FEET/SEC.) =   4.55
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11904.00 =    4708.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11904.00 TO NODE  11905.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2186.04  DOWNSTREAM(FEET) =   1957.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.87   CHANNEL SLOPE =  0.1187
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.871
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       63.15      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.53
  AVERAGE FLOW DEPTH(FEET) =   1.75   TRAVEL TIME(MIN.) =   4.27
  Tc(MIN.) =   31.29
  SUBAREA AREA(ACRES) =    63.15       SUBAREA RUNOFF(CFS) =   21.05
  EFFECTIVE AREA(ACRES) =    199.78     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      199.8         PEAK FLOW RATE(CFS) =      70.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.76   FLOW VELOCITY(FEET/SEC.) =   7.56
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11905.00 =    6635.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11905.00 TO NODE  11906.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1957.34  DOWNSTREAM(FEET) =   1244.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2498.96   CHANNEL SLOPE =  0.2854
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.822
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.87      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      82.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.95
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   35.10
  SUBAREA AREA(ACRES) =    84.87       SUBAREA RUNOFF(CFS) =   24.60
  EFFECTIVE AREA(ACRES) =    284.65     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      284.6         PEAK FLOW RATE(CFS) =      86.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =  11.02
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11906.00 =    9134.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1244.16  DOWNSTREAM(FEET) =    873.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3370.75   CHANNEL SLOPE =  0.1098
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.744
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.43      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     107.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.20
  AVERAGE FLOW DEPTH(FEET) =   2.10   TRAVEL TIME(MIN.) =   6.85
  Tc(MIN.) =   41.95
  SUBAREA AREA(ACRES) =   199.43       SUBAREA RUNOFF(CFS) =   43.72
  EFFECTIVE AREA(ACRES) =    484.08     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      484.1         PEAK FLOW RATE(CFS) =     109.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.11   FLOW VELOCITY(FEET/SEC.) =   8.22
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11920.00 =   12505.25 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.95
  RAINFALL INTENSITY(INCH/HR) =   0.74
  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98
  EFFECTIVE STREAM AREA(ACRES) =     484.08
  TOTAL STREAM AREA(ACRES) =     484.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     109.62

****************************************************************************
  FLOW PROCESS FROM NODE  11910.00 TO NODE  11911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   517.62
  ELEVATION DATA: UPSTREAM(FEET) =   2531.88  DOWNSTREAM(FEET) =   2441.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.185
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.605
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        3.46      0.50     1.000     0   12.19
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.44
  TOTAL AREA(ACRES) =      3.46   PEAK FLOW RATE(CFS) =      3.44

****************************************************************************
  FLOW PROCESS FROM NODE  11911.00 TO NODE  11912.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2441.33  DOWNSTREAM(FEET) =   2382.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   397.30   CHANNEL SLOPE =  0.1488
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.458
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.79      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.43
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   1.49
```

```
  Tc(MIN.) =   13.68
  SUBAREA AREA(ACRES) =     5.79       SUBAREA RUNOFF(CFS) =    4.99
  EFFECTIVE AREA(ACRES) =      9.25     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =       7.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   4.79
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11912.00 =     914.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11912.00 TO NODE  11913.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2382.20  DOWNSTREAM(FEET) =   2263.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1891.47   CHANNEL SLOPE =  0.0626
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.117
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.30      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.51
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   6.99
  Tc(MIN.) =   20.67
  SUBAREA AREA(ACRES) =    54.30       SUBAREA RUNOFF(CFS) =   30.16
  EFFECTIVE AREA(ACRES) =     63.55     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       63.5         PEAK FLOW RATE(CFS) =      35.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.53   FLOW VELOCITY(FEET/SEC.) =   5.02
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11913.00 =    2806.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11913.00 TO NODE  11914.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.77  DOWNSTREAM(FEET) =   1845.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1957.31   CHANNEL SLOPE =  0.2138
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.006
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       65.14      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.20
```



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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.64
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   3.77
  Tc(MIN.) =   24.44
  SUBAREA AREA(ACRES) =    65.14       SUBAREA RUNOFF(CFS) =   29.68
  EFFECTIVE AREA(ACRES) =    128.69     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      128.7         PEAK FLOW RATE(CFS) =      58.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.47   FLOW VELOCITY(FEET/SEC.) =   9.05
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11914.00 =    4763.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11914.00 TO NODE  11915.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1845.23  DOWNSTREAM(FEET) =   1557.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1686.78   CHANNEL SLOPE =  0.1708
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.936
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.52      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.79
  AVERAGE FLOW DEPTH(FEET) =   1.68   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   27.64
  SUBAREA AREA(ACRES) =    78.52       SUBAREA RUNOFF(CFS) =   30.77
  EFFECTIVE AREA(ACRES) =    207.21     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.2         PEAK FLOW RATE(CFS) =      81.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.73   FLOW VELOCITY(FEET/SEC.) =   8.99
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11915.00 =    6450.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11915.00 TO NODE  11916.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1557.21  DOWNSTREAM(FEET) =   1403.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.39   CHANNEL SLOPE =  0.0806
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.859
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       70.48      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      92.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.99
  AVERAGE FLOW DEPTH(FEET) =   2.10   TRAVEL TIME(MIN.) =   4.55
  Tc(MIN.) =   32.19
  SUBAREA AREA(ACRES) =    70.48       SUBAREA RUNOFF(CFS) =   22.77
  EFFECTIVE AREA(ACRES) =    277.69     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      277.7         PEAK FLOW RATE(CFS) =      89.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.07   FLOW VELOCITY(FEET/SEC.) =   6.96
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11916.00 =    8359.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11916.00 TO NODE  11917.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1403.38  DOWNSTREAM(FEET) =   1079.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1945.82   CHANNEL SLOPE =  0.1662
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.817
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      232.20      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     122.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.84
  AVERAGE FLOW DEPTH(FEET) =   2.04   TRAVEL TIME(MIN.) =   3.29
  Tc(MIN.) =   35.48
  SUBAREA AREA(ACRES) =   232.20       SUBAREA RUNOFF(CFS) =   66.28
  EFFECTIVE AREA(ACRES) =    509.89     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      509.9         PEAK FLOW RATE(CFS) =     145.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.17   FLOW VELOCITY(FEET/SEC.) =  10.29
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11917.00 =   10305.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1079.99  DOWNSTREAM(FEET) =    873.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2563.91   CHANNEL SLOPE =  0.0804
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.753
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



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  USER-DEFINED               -      110.82      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     158.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.01
  AVERAGE FLOW DEPTH(FEET) =   2.57   TRAVEL TIME(MIN.) =   5.34
  Tc(MIN.) =   40.82
  SUBAREA AREA(ACRES) =   110.82       SUBAREA RUNOFF(CFS) =   25.23
  EFFECTIVE AREA(ACRES) =    620.71     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      620.7         PEAK FLOW RATE(CFS) =     145.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.49   FLOW VELOCITY(FEET/SEC.) =   7.82
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   40.82
  RAINFALL INTENSITY(INCH/HR) =   0.75
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     620.71
  TOTAL STREAM AREA(ACRES) =     620.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     145.54

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      109.62   41.95    0.744  0.50( 0.49) 0.98     484.1   11900.00
      2      145.54   40.82    0.753  0.50( 0.50) 1.00     620.7   11910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      255.16   40.82    0.753  0.50( 0.50) 0.99    1091.7   11910.00
      2      249.76   41.95    0.744  0.50( 0.50) 0.99    1104.8   11900.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     255.16    Tc(MIN.) =    40.82
  EFFECTIVE AREA(ACRES) =    1091.74   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     1104.8
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11920.00 TO NODE  11921.00 IS CODE =  51
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    873.95  DOWNSTREAM(FEET) =    827.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1417.25   CHANNEL SLOPE =  0.0325
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.723
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      107.47      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     265.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.49
  AVERAGE FLOW DEPTH(FEET) =   3.70   TRAVEL TIME(MIN.) =   3.64
  Tc(MIN.) =   44.46
  SUBAREA AREA(ACRES) =   107.47       SUBAREA RUNOFF(CFS) =   21.55
  EFFECTIVE AREA(ACRES) =   1199.21     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1212.3         PEAK FLOW RATE(CFS) =     255.16
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.64   FLOW VELOCITY(FEET/SEC.) =   6.41
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11921.00 =   14286.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11921.00 TO NODE  11922.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    827.94  DOWNSTREAM(FEET) =    753.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.43   CHANNEL SLOPE =  0.0394
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.686
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      344.27      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     284.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.10
  AVERAGE FLOW DEPTH(FEET) =   3.65   TRAVEL TIME(MIN.) =   4.43
  Tc(MIN.) =   48.89
  SUBAREA AREA(ACRES) =   344.27       SUBAREA RUNOFF(CFS) =   57.63
  EFFECTIVE AREA(ACRES) =   1543.48     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1556.5         PEAK FLOW RATE(CFS) =     261.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.54   FLOW VELOCITY(FEET/SEC.) =   6.95
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11922.00 =   16173.28 FEET.
```



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****************************************************************************
  FLOW PROCESS FROM NODE  11922.00 TO NODE  11923.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    753.55  DOWNSTREAM(FEET) =    641.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.88   CHANNEL SLOPE =  0.0391
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.643
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.18      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     272.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.99
  AVERAGE FLOW DEPTH(FEET) =   3.60   TRAVEL TIME(MIN.) =   6.82
  Tc(MIN.) =   55.71
  SUBAREA AREA(ACRES) =   165.18       SUBAREA RUNOFF(CFS) =   21.19
  EFFECTIVE AREA(ACRES) =   1708.66     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1721.7         PEAK FLOW RATE(CFS) =     261.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.55   FLOW VELOCITY(FEET/SEC.) =   6.92
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11923.00 =   19034.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11923.00 TO NODE  11924.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    641.58  DOWNSTREAM(FEET) =    579.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1844.02   CHANNEL SLOPE =  0.0335
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.616
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      433.73      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     284.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.66
  AVERAGE FLOW DEPTH(FEET) =   3.77   TRAVEL TIME(MIN.) =   4.61
  Tc(MIN.) =   60.32
  SUBAREA AREA(ACRES) =   433.73       SUBAREA RUNOFF(CFS) =   45.16
  EFFECTIVE AREA(ACRES) =   2142.39     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2155.4         PEAK FLOW RATE(CFS) =     261.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.65   FLOW VELOCITY(FEET/SEC.) =   6.54
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11924.00 =   20878.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11924.00 TO NODE  11925.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    579.89  DOWNSTREAM(FEET) =    494.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2756.15   CHANNEL SLOPE =  0.0311
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.591
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      265.42      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     272.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.43
  AVERAGE FLOW DEPTH(FEET) =   3.76   TRAVEL TIME(MIN.) =   7.14
  Tc(MIN.) =   67.46
  SUBAREA AREA(ACRES) =   265.42       SUBAREA RUNOFF(CFS) =   21.78
  EFFECTIVE AREA(ACRES) =   2407.81     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2420.9         PEAK FLOW RATE(CFS) =     261.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.70   FLOW VELOCITY(FEET/SEC.) =   6.36
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11925.00 =   23634.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11925.00 TO NODE  11926.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    494.12  DOWNSTREAM(FEET) =    458.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1922.70   CHANNEL SLOPE =  0.0186
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.570
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       97.46      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     264.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.25
  AVERAGE FLOW DEPTH(FEET) =   4.10   TRAVEL TIME(MIN.) =   6.10
  Tc(MIN.) =   73.56
  SUBAREA AREA(ACRES) =    97.46       SUBAREA RUNOFF(CFS) =    6.16
```



```
  EFFECTIVE AREA(ACRES) =   2505.27     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2518.3         PEAK FLOW RATE(CFS) =     261.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.08   FLOW VELOCITY(FEET/SEC.) =   5.25
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11926.00 =   25557.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11926.00 TO NODE  11927.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    458.40  DOWNSTREAM(FEET) =    399.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2170.13   CHANNEL SLOPE =  0.0274
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.550
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.83      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     263.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.06
  AVERAGE FLOW DEPTH(FEET) =   3.80   TRAVEL TIME(MIN.) =   5.96
  Tc(MIN.) =   79.53
  SUBAREA AREA(ACRES) =    53.83       SUBAREA RUNOFF(CFS) =    2.41
  EFFECTIVE AREA(ACRES) =   2559.10     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2572.1         PEAK FLOW RATE(CFS) =     261.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.79   FLOW VELOCITY(FEET/SEC.) =   6.06
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610401U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      262.60   29.88  0.50( 0.50) 1.00     621.9   40120.00
      2      252.78   32.04  0.50( 0.50) 1.00     652.1   40100.00
    TOTAL AREA(ACRES) =      652.1

****************************************************************************
  FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      261.80   79.53    0.550  0.50( 0.50) 1.00    2559.1   11910.00
     2      250.56   81.03    0.545  0.50( 0.50) 1.00    2572.1   11900.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      262.60   29.88    0.889  0.50( 0.50) 1.00     621.9   40120.00
     2      252.78   32.04    0.861  0.50( 0.50) 1.00     652.1   40100.00
 LONGEST FLOWPATH FROM NODE  40100.00 TO NODE  11927.00 =   10245.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      524.39   29.88    0.889  0.50( 0.50) 1.00    1583.5   40120.00
     2      514.58   32.04    0.861  0.50( 0.50) 1.00    1683.2   40100.00
     3      296.65   79.53    0.550  0.50( 0.50) 1.00    3211.2   11910.00
     4      281.81   81.03    0.545  0.50( 0.50) 1.00    3224.2   11900.00
   TOTAL AREA(ACRES) =      3224.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      524.39  Tc(MIN.) =   29.883
 EFFECTIVE AREA(ACRES) =   1583.52  AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3224.2
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.50 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    399.00  DOWNSTREAM(FEET) =    384.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   986.26   CHANNEL SLOPE =  0.0152
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 CHANNEL FLOW THRU SUBAREA(CFS) =     524.39
 FLOW VELOCITY(FEET/SEC.) =   5.79   FLOW DEPTH(FEET) =   5.50
 TRAVEL TIME(MIN.) =   2.84   Tc(MIN.) =   32.72
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610402U.DNA
```



```
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       25.72   14.69  0.50( 0.50) 1.00      33.3   40200.00
   TOTAL AREA(ACRES) =       33.3

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      524.39   32.72    0.852  0.50( 0.50) 1.00    1583.5   40120.00
     2      514.58   34.90    0.825  0.50( 0.50) 1.00    1683.2   40100.00
     3      296.65   82.80    0.539  0.50( 0.50) 1.00    3211.2   11910.00
     4      281.81   84.34    0.533  0.50( 0.50) 1.00    3224.2   11900.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       25.72   14.69    1.358  0.50( 0.50) 1.00      33.3   40200.00
 LONGEST FLOWPATH FROM NODE  40200.00 TO NODE  11927.50 =    1999.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      550.11   14.69    1.358  0.50( 0.50) 1.00     744.2   40200.00
     2      534.95   32.72    0.852  0.50( 0.50) 1.00    1616.8   40120.00
     3      524.30   34.90    0.825  0.50( 0.50) 1.00    1716.5   40100.00
     4      297.81   82.80    0.539  0.50( 0.50) 1.00    3244.5   11910.00
     5      282.81   84.34    0.533  0.50( 0.50) 1.00    3257.5   11900.00
   TOTAL AREA(ACRES) =      3257.5

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      550.11  Tc(MIN.) =   14.691
 EFFECTIVE AREA(ACRES) =    744.21  AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3257.5
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11928.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    384.00  DOWNSTREAM(FEET) =    359.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   647.19   CHANNEL SLOPE =  0.0386
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.291
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -       78.01      0.50     0.984     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     578.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.41
  AVERAGE FLOW DEPTH(FEET) =   4.79   TRAVEL TIME(MIN.) =   1.28
  Tc(MIN.) =   15.97
  SUBAREA AREA(ACRES) =    78.01       SUBAREA RUNOFF(CFS) =   56.07
  EFFECTIVE AREA(ACRES) =    822.22     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3335.5          PEAK FLOW RATE(CFS) =     586.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.81   FLOW VELOCITY(FEET/SEC.) =   8.44
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11928.00 =   29360.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    359.00  DOWNSTREAM(FEET) =    341.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1322.66   CHANNEL SLOPE =  0.0131
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.141
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.18      0.50     0.890     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     588.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.64
  AVERAGE FLOW DEPTH(FEET) =   5.90   TRAVEL TIME(MIN.) =   3.91
  Tc(MIN.) =   19.88
  SUBAREA AREA(ACRES) =     8.18       SUBAREA RUNOFF(CFS) =    5.13
  EFFECTIVE AREA(ACRES) =    830.40     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3343.7          PEAK FLOW RATE(CFS) =     586.20
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.89   FLOW VELOCITY(FEET/SEC.) =   5.63
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11929.00 =   30683.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  11527.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  12527.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S18.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     6867.40   43.27  0.50( 0.50) 0.99    7177.1   11801.00
      2     6864.20   46.60  0.50( 0.50) 0.99    7820.1   11831.00
      3     6827.41   54.47  0.50( 0.50) 0.99    9256.8   11500.00
      4     6774.38   60.04  0.50( 0.50) 0.99   10623.4   11701.00
      5     6677.83   66.19  0.50( 0.50) 1.00   12122.0   11000.00
      6     6471.50   83.04  0.50( 0.50) 1.00   17602.3   11330.00
      7     6339.19   88.37  0.50( 0.50) 1.00   19497.8   10900.00
      8     6228.99   91.63  0.50( 0.50) 1.00   20595.4   10830.00
      9     5982.84   96.58  0.50( 0.50) 1.00   21984.5   11130.00
     10     5362.41  107.51  0.50( 0.50) 1.00   24460.7   11620.00
     11     5078.93  112.52  0.50( 0.50) 1.00   25521.9   10600.00
     12     4959.40  115.03  0.50( 0.50) 1.00   26054.1   11600.00
     13     4205.04  125.28  0.50( 0.50) 1.00   27869.2   10500.00
     14     3683.17  134.26  0.50( 0.50) 1.00   29002.2   10710.00
     15     3076.48  146.58  0.50( 0.50) 1.00   30024.8   10700.00
     16     2647.10  155.91  0.50( 0.50) 1.00   30697.4   10400.00
     17     2291.75  164.23  0.50( 0.50) 1.00   31187.9   10200.00
     18     1901.37  178.29  0.50( 0.50) 1.00   31917.3   10300.00
     19     1742.13  184.66  0.50( 0.50) 1.00   32048.2   10210.00
     20      606.32  267.22  0.50( 0.50) 1.00   32916.6   10100.00
   TOTAL AREA(ACRES) =    32916.6

****************************************************************************
  FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================
  ***MEMORY BANK #  2 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
  FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S25.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1893.31   82.28  0.50( 0.49) 0.99    5725.3   12500.00
      2     1840.62  100.98  0.50( 0.49) 0.99    7457.8   12300.00
      3     1831.53  103.77  0.50( 0.49) 0.99    7808.6   12330.00
      4     1786.78  113.56  0.50( 0.49) 0.98    8943.7   12410.00
      5     1724.80  122.42  0.50( 0.49) 0.98    9877.4   12400.00
      6     1698.50  124.28  0.50( 0.49) 0.98   10032.3   12211.00
      7     1550.96  132.89  0.50( 0.49) 0.98   10708.4   12201.00
      8     1387.41  141.42  0.50( 0.49) 0.98   11230.5   12111.00
      9     1286.30  147.09  0.50( 0.49) 0.98   11586.7   12231.00
     10     1154.92  155.75  0.50( 0.49) 0.98   12067.4   12261.00
```

11	1139.24	156.89	0.50(0.49)	0.98	12112.7	12101.10
12	822.15	184.49	0.50(0.49)	0.98	13109.5	12010.00
13	621.30	203.50	0.50(0.49)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

****

FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 14.0

>>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

==========

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1893.31	82.28	0.50(0.49)	0.99	5725.3	12500.00
2	1840.62	100.98	0.50(0.49)	0.99	7457.8	12300.00
3	1831.53	103.77	0.50(0.49)	0.99	7808.6	12330.00
4	1786.78	113.56	0.50(0.49)	0.98	8943.7	12410.00
5	1724.80	122.42	0.50(0.49)	0.98	9877.4	12400.00
6	1698.50	124.28	0.50(0.49)	0.98	10032.3	12211.00
7	1550.96	132.89	0.50(0.49)	0.98	10708.4	12201.00
8	1387.41	141.42	0.50(0.49)	0.98	11230.5	12111.00
9	1286.30	147.09	0.50(0.49)	0.98	11586.7	12231.00
10	1154.92	155.75	0.50(0.49)	0.98	12067.4	12261.00
11	1139.24	156.89	0.50(0.49)	0.98	12112.7	12101.10
12	822.15	184.49	0.50(0.49)	0.98	13109.5	12010.00
13	621.30	203.50	0.50(0.49)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

****

FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1893.31	82.28	0.541	0.50(0.49)	0.99	5725.3	12500.00
2	1840.62	100.98	0.493	0.50(0.49)	0.99	7457.8	12300.00
3	1831.53	103.77	0.487	0.50(0.49)	0.99	7808.6	12330.00
4	1786.78	113.56	0.468	0.50(0.49)	0.98	8943.7	12410.00
5	1724.80	122.42	0.453	0.50(0.49)	0.98	9877.4	12400.00
6	1698.50	124.28	0.451	0.50(0.49)	0.98	10032.3	12211.00
7	1550.96	132.89	0.441	0.50(0.49)	0.98	10708.4	12201.00
8	1387.41	141.42	0.430	0.50(0.49)	0.98	11230.5	12111.00
9	1286.30	147.09	0.423	0.50(0.49)	0.98	11586.7	12231.00
10	1154.92	155.75	0.413	0.50(0.49)	0.98	12067.4	12261.00
11	1139.24	156.89	0.412	0.50(0.49)	0.98	12112.7	12101.10
12	822.15	184.49	0.382	0.50(0.49)	0.98	13109.5	12010.00
13	621.30	203.50	0.371	0.50(0.49)	0.98	13237.1	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6867.40	43.27	0.733	0.50(0.50)	0.99	7177.1	11801.00
2	6864.20	46.60	0.705	0.50(0.50)	0.99	7820.1	11831.00

3	6827.41	54.47	0.650	0.50(0.50)	0.99	9256.8	11500.00
4	6774.38	60.04	0.617	0.50(0.50)	0.99	10623.4	11701.00
5	6677.83	66.19	0.596	0.50(0.50)	1.00	12122.0	11000.00
6	6471.50	83.04	0.538	0.50(0.50)	1.00	17602.3	11330.00
7	6339.19	88.37	0.520	0.50(0.50)	1.00	19497.8	10900.00
8	6228.99	91.63	0.511	0.50(0.50)	1.00	20595.4	10830.00
9	5982.84	96.58	0.501	0.50(0.50)	1.00	21984.5	11130.00
10	5362.41	107.51	0.480	0.50(0.50)	1.00	24460.7	11620.00
11	5078.93	112.52	0.470	0.50(0.50)	1.00	25521.9	10600.00
12	4959.40	115.03	0.466	0.50(0.50)	1.00	26054.1	11600.00
13	4205.04	125.28	0.450	0.50(0.50)	1.00	27869.2	10500.00
14	3683.17	134.26	0.439	0.50(0.50)	1.00	29002.2	10710.00
15	3076.48	146.58	0.424	0.50(0.50)	1.00	30024.8	10700.00
16	2647.10	155.91	0.413	0.50(0.50)	1.00	30697.4	10400.00
17	2291.75	164.23	0.403	0.50(0.50)	1.00	31187.9	10200.00
18	1901.37	178.29	0.386	0.50(0.50)	1.00	31917.3	10300.00
19	1742.13	184.66	0.381	0.50(0.50)	1.00	32048.2	10210.00
20	606.32	267.22	0.337	0.50(0.50)	1.00	32916.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8760.71	43.27	0.733	0.50(0.50)	0.99	10187.8	11801.00
2	8757.51	46.60	0.705	0.50(0.50)	0.99	11062.9	11831.00
3	8720.72	54.47	0.650	0.50(0.50)	0.99	13047.0	11500.00
4	8667.69	60.04	0.617	0.50(0.50)	0.99	14801.6	11701.00
5	8571.14	66.19	0.596	0.50(0.50)	0.99	16727.9	11000.00
6	8374.21	82.28	0.541	0.50(0.50)	0.99	23078.0	12500.00
7	8362.65	83.04	0.538	0.50(0.50)	0.99	23398.7	11330.00
8	8215.32	88.37	0.520	0.50(0.50)	0.99	25787.9	10900.00
9	8095.94	91.63	0.511	0.50(0.50)	0.99	27187.4	10830.00
10	7835.84	96.58	0.501	0.50(0.50)	0.99	29034.9	11130.00
11	7573.86	100.98	0.493	0.50(0.50)	0.99	30438.4	12300.00
12	7406.40	103.77	0.487	0.50(0.50)	0.99	31421.3	12330.00
13	7176.82	107.51	0.480	0.50(0.50)	0.99	32703.5	11620.00
14	6870.45	112.52	0.470	0.50(0.50)	0.99	34345.6	10600.00
15	6816.35	113.56	0.468	0.50(0.50)	0.99	34685.5	12410.00
16	6735.89	115.03	0.466	0.50(0.50)	0.99	35152.9	11600.00
17	6139.97	122.42	0.453	0.50(0.50)	0.99	37241.1	12400.00
18	5977.28	124.28	0.451	0.50(0.50)	0.99	37724.1	12211.00
19	5886.38	125.28	0.450	0.50(0.50)	0.99	37980.2	10500.00
20	5313.74	132.89	0.441	0.50(0.50)	0.99	39537.8	12201.00
21	5207.87	134.26	0.439	0.50(0.50)	0.99	39794.4	10710.00
22	4718.02	141.42	0.430	0.50(0.50)	0.99	40826.9	12111.00
23	4371.84	146.58	0.424	0.50(0.50)	0.99	41579.6	10700.00
24	4339.40	147.09	0.423	0.50(0.50)	0.99	41648.1	12231.00
25	3808.99	155.75	0.413	0.50(0.50)	0.99	42753.9	12261.00
26	3799.93	155.91	0.413	0.50(0.50)	0.99	42770.9	10400.00
27	3744.30	156.89	0.412	0.50(0.50)	0.99	42868.2	12101.10
28	3346.67	164.23	0.403	0.50(0.50)	0.99	43565.7	10200.00
29	2794.70	178.29	0.386	0.50(0.50)	0.99	44803.0	10300.00
30	2568.61	184.49	0.382	0.50(0.50)	0.99	45154.1	12010.00
31	2562.44	184.66	0.381	0.50(0.50)	0.99	45158.9	10210.00
32	2104.24	203.50	0.371	0.50(0.50)	0.99	45483.5	12000.00
33	1169.56	267.22	0.337	0.50(0.50)	0.99	46153.7	10100.00

TOTAL AREA(ACRES) = 46153.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 8760.71 Tc(MIN.) = 43.265
EFFECTIVE AREA(ACRES) = 10187.79 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46153.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

****
FLOW PROCESS FROM NODE 12527.00 TO NODE 11929.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 347.47 DOWNSTREAM(FEET) = 341.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 532.38 CHANNEL SLOPE = 0.0110
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.728
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.37	0.50	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8762.22
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.03
AVERAGE FLOW DEPTH(FEET) = 14.43 TRAVEL TIME(MIN.) = 0.63
Tc(MIN.) = 43.90
SUBAREA AREA(ACRES) = 14.37 SUBAREA RUNOFF(CFS) = 3.03
EFFECTIVE AREA(ACRES) = 10202.16 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46168.0 PEAK FLOW RATE(CFS) = 8760.71
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 14.43 FLOW VELOCITY(FEET/SEC.) = 14.02
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

****
FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8760.71	43.90	0.728	0.50(0.50)	0.99	10202.2	11801.00
2	8757.51	47.23	0.700	0.50(0.50)	0.99	11077.2	11831.00
3	8720.72	55.10	0.646	0.50(0.50)	0.99	13061.4	11500.00
4	8667.69	60.68	0.615	0.50(0.50)	0.99	14815.9	11701.00
5	8571.14	66.83	0.594	0.50(0.50)	0.99	16742.3	11000.00
6	8374.21	82.91	0.538	0.50(0.50)	0.99	23092.4	12500.00
7	8362.65	83.68	0.536	0.50(0.50)	0.99	23413.0	11330.00
8	8215.32	89.02	0.517	0.50(0.50)	0.99	25802.3	10900.00
9	8095.94	92.28	0.510	0.50(0.50)	0.99	27201.7	10830.00
10	7835.84	97.23	0.500	0.50(0.50)	0.99	29049.3	11130.00
11	7573.86	101.64	0.492	0.50(0.50)	0.99	30452.8	12300.00

12	7406.40	104.43	0.486	0.50(0.50)	0.99	31435.7	12330.00
13	7176.82	108.18	0.479	0.50(0.50)	0.99	32717.9	11620.00
14	6870.45	113.19	0.469	0.50(0.50)	0.99	34359.9	10600.00
15	6816.35	114.23	0.467	0.50(0.50)	0.99	34699.9	12410.00
16	6735.89	115.71	0.464	0.50(0.50)	0.99	35167.3	11600.00
17	6139.97	123.11	0.452	0.50(0.50)	0.99	37255.4	12400.00
18	5977.28	124.97	0.450	0.50(0.50)	0.99	37738.5	12211.00
19	5886.38	125.98	0.449	0.50(0.50)	0.99	37994.6	10500.00
20	5313.74	133.60	0.440	0.50(0.50)	0.99	39552.2	12201.00
21	5207.87	134.98	0.438	0.50(0.50)	0.99	39808.8	10710.00
22	4718.02	142.16	0.429	0.50(0.50)	0.99	40841.3	12111.00
23	4371.84	147.33	0.423	0.50(0.50)	0.99	41593.9	10700.00
24	4339.40	147.84	0.423	0.50(0.50)	0.99	41662.5	12231.00
25	3808.99	156.53	0.412	0.50(0.50)	0.99	42768.3	12261.00
26	3799.93	156.69	0.412	0.50(0.50)	0.99	42785.2	10400.00
27	3744.30	157.67	0.411	0.50(0.50)	0.99	42882.6	12101.10
28	3346.67	165.03	0.402	0.50(0.50)	0.99	43580.1	10200.00
29	2794.70	179.14	0.385	0.50(0.50)	0.99	44817.4	10300.00
30	2568.61	185.35	0.381	0.50(0.50)	0.99	45168.5	12010.00
31	2562.44	185.52	0.381	0.50(0.50)	0.99	45173.2	10210.00
32	2104.24	204.40	0.371	0.50(0.50)	0.99	45497.8	12000.00
33	1169.56	268.26	0.336	0.50(0.50)	0.99	46168.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	586.20	19.88	1.141	0.50(0.50)	1.00	830.4	40200.00
2	534.95	38.03	0.785	0.50(0.50)	1.00	1703.0	40120.00
3	524.30	40.23	0.758	0.50(0.50)	1.00	1802.7	40100.00
4	297.81	88.95	0.518	0.50(0.50)	1.00	3330.7	11910.00
5	282.81	90.57	0.513	0.50(0.50)	1.00	3343.7	11900.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9346.91	19.88	1.141	0.50(0.50)	0.99	5451.5	40200.00
2	9295.66	38.03	0.785	0.50(0.50)	0.99	10540.5	40120.00
3	9285.02	40.23	0.758	0.50(0.50)	0.99	11152.6	40100.00
4	9267.97	43.90	0.728	0.50(0.50)	0.99	12119.8	11801.00
5	9249.27	47.23	0.700	0.50(0.50)	0.99	13099.5	11831.00
6	9175.90	55.10	0.646	0.50(0.50)	0.99	15330.4	11500.00
7	9096.95	60.68	0.615	0.50(0.50)	0.99	17259.8	11701.00
8	8971.81	66.83	0.594	0.50(0.50)	0.99	19379.0	11000.00
9	8700.08	82.91	0.538	0.50(0.50)	0.99	26233.8	12500.00
10	8684.95	83.68	0.536	0.50(0.50)	0.99	26578.4	11330.00
11	8514.89	88.95	0.518	0.50(0.50)	0.99	29104.3	11910.00
12	8512.53	89.02	0.517	0.50(0.50)	0.99	29133.5	10900.00
13	8441.27	90.57	0.513	0.50(0.50)	0.99	29812.6	11900.00
14	8312.88	92.28	0.510	0.50(0.50)	0.99	30545.5	10830.00
15	7865.37	97.23	0.500	0.50(0.50)	0.99	32393.0	11130.00
16	7602.89	101.64	0.492	0.50(0.50)	0.99	33796.5	12300.00
17	7435.11	104.43	0.486	0.50(0.50)	0.99	34779.4	12330.00
18	7205.10	108.18	0.479	0.50(0.50)	0.99	36061.6	11620.00
19	6898.16	113.19	0.469	0.50(0.50)	0.99	37703.6	10600.00
20	6843.93	114.23	0.467	0.50(0.50)	0.99	38043.6	12410.00
21	6763.31	115.71	0.464	0.50(0.50)	0.99	38511.0	11600.00

22	6166.68	123.11	0.452	0.50(0.50)	0.99	40599.1	12400.00
23	6003.86	124.97	0.450	0.50(0.50)	0.99	41082.2	12211.00
24	5912.89	125.98	0.449	0.50(0.50)	0.99	41338.3	10500.00
25	5339.70	133.60	0.440	0.50(0.50)	0.99	42895.9	12201.00
26	5233.73	134.98	0.438	0.50(0.50)	0.99	43152.5	10710.00
27	4743.38	142.16	0.429	0.50(0.50)	0.99	44185.0	12111.00
28	4396.83	147.33	0.423	0.50(0.50)	0.99	44937.7	10700.00
29	4364.36	147.84	0.423	0.50(0.50)	0.99	45006.2	12231.00
30	3833.33	156.53	0.412	0.50(0.50)	0.99	46112.0	12261.00
31	3824.26	156.69	0.412	0.50(0.50)	0.99	46129.0	10400.00
32	3768.56	157.67	0.411	0.50(0.50)	0.99	46226.3	12101.10
33	3370.40	165.03	0.402	0.50(0.50)	0.99	46923.8	10200.00
34	2817.44	179.14	0.385	0.50(0.50)	0.99	48161.1	10300.00
35	2591.11	185.35	0.381	0.50(0.50)	0.99	48512.2	12010.00
36	2584.94	185.52	0.381	0.50(0.50)	0.99	48517.0	10210.00
37	2126.14	204.40	0.371	0.50(0.50)	0.99	48841.6	12000.00
38	1189.40	268.26	0.336	0.50(0.50)	0.99	49511.8	10100.00

TOTAL AREA(ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 9346.91 Tc(MIN.) = 19.884
EFFECTIVE AREA(ACRES) = 5451.46 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49511.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 49511.8 TC(MIN.) = 19.88
EFFECTIVE AREA(ACRES) = 5451.46 AREA-AVERAGED Fm(INCH/HR)= 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.993
PEAK FLOW RATE(CFS) = 9346.91

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9346.91	19.88	1.141	0.50(0.50)	0.99	5451.5	40200.00
2	9295.66	38.03	0.785	0.50(0.50)	0.99	10540.5	40120.00
3	9285.02	40.23	0.758	0.50(0.50)	0.99	11152.6	40100.00
4	9267.97	43.90	0.728	0.50(0.50)	0.99	12119.8	11801.00
5	9249.27	47.23	0.700	0.50(0.50)	0.99	13099.5	11831.00
6	9175.90	55.10	0.646	0.50(0.50)	0.99	15330.4	11500.00
7	9096.95	60.68	0.615	0.50(0.50)	0.99	17259.8	11701.00
8	8971.81	66.83	0.594	0.50(0.50)	0.99	19379.0	11000.00
9	8700.08	82.91	0.538	0.50(0.50)	0.99	26233.8	12500.00
10	8684.95	83.68	0.536	0.50(0.50)	0.99	26578.4	11330.00
11	8514.89	88.95	0.518	0.50(0.50)	0.99	29104.3	11910.00
12	8512.53	89.02	0.517	0.50(0.50)	0.99	29133.5	10900.00
13	8441.27	90.57	0.513	0.50(0.50)	0.99	29812.6	11900.00
14	8312.88	92.28	0.510	0.50(0.50)	0.99	30545.5	10830.00
15	7865.37	97.23	0.500	0.50(0.50)	0.99	32393.0	11130.00
16	7602.89	101.64	0.492	0.50(0.50)	0.99	33796.5	12300.00
17	7435.11	104.43	0.486	0.50(0.50)	0.99	34779.4	12330.00
18	7205.10	108.18	0.479	0.50(0.50)	0.99	36061.6	11620.00
19	6898.16	113.19	0.469	0.50(0.50)	0.99	37703.6	10600.00
20	6843.93	114.23	0.467	0.50(0.50)	0.99	38043.6	12410.00
21	6763.31	115.71	0.464	0.50(0.50)	0.99	38511.0	11600.00
22	6166.68	123.11	0.452	0.50(0.50)	0.99	40599.1	12400.00
23	6003.86	124.97	0.450	0.50(0.50)	0.99	41082.2	12211.00

24	5912.89	125.98	0.449	0.50(0.50)	0.99	41338.3	10500.00
25	5339.70	133.60	0.440	0.50(0.50)	0.99	42895.9	12201.00
26	5233.73	134.98	0.438	0.50(0.50)	0.99	43152.5	10710.00
27	4743.38	142.16	0.429	0.50(0.50)	0.99	44185.0	12111.00
28	4396.83	147.33	0.423	0.50(0.50)	0.99	44937.7	10700.00
29	4364.36	147.84	0.423	0.50(0.50)	0.99	45006.2	12231.00
30	3833.33	156.53	0.412	0.50(0.50)	0.99	46112.0	12261.00
31	3824.26	156.69	0.412	0.50(0.50)	0.99	46129.0	10400.00
32	3768.56	157.67	0.411	0.50(0.50)	0.99	46226.3	12101.10
33	3370.40	165.03	0.402	0.50(0.50)	0.99	46923.8	10200.00
34	2817.44	179.14	0.385	0.50(0.50)	0.99	48161.1	10300.00
35	2591.11	185.35	0.381	0.50(0.50)	0.99	48512.2	12010.00
36	2584.94	185.52	0.381	0.50(0.50)	0.99	48517.0	10210.00
37	2126.14	204.40	0.371	0.50(0.50)	0.99	48841.6	12000.00
38	1189.40	268.26	0.336	0.50(0.50)	0.99	49511.8	10100.00

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END OF RATIONAL METHOD ANALYSIS

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            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S20.DAT
  TIME/DATE OF STUDY: 14:04 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.503
   2)   10.00;  1.686
   3)   15.00;  1.273
   4)   20.00;  1.087
   5)   25.00;  0.952
   6)   30.00;  0.860
   7)   40.00;  0.731
   8)   50.00;  0.649
   9)   60.00;  0.586
  10)   90.00;  0.482
  11)  120.00;  0.421
  12)  180.00;  0.350
  13)  360.00;  0.253
  14) 1440.00;  0.110
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12000.00 TO NODE  12001.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   965.01
  ELEVATION DATA: UPSTREAM(FEET) =   4506.20  DOWNSTREAM(FEET) =   4179.61

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.700
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.380
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        9.03      0.50     1.000     0   13.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.15
  TOTAL AREA(ACRES) =      9.03   PEAK FLOW RATE(CFS) =      7.15

**************************************************************************
  FLOW PROCESS FROM NODE  12001.00 TO NODE  12002.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4179.61  DOWNSTREAM(FEET) =   3849.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.60   CHANNEL SLOPE =  0.3380
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.240
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.82      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.45
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   2.19
  Tc(MIN.) =   15.89
  SUBAREA AREA(ACRES) =    18.82       SUBAREA RUNOFF(CFS) =   12.53
  EFFECTIVE AREA(ACRES) =     27.85     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.8         PEAK FLOW RATE(CFS) =      18.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   7.98
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12002.00 =    1941.61 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12002.00 TO NODE  12003.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   3849.51  DOWNSTREAM(FEET) =   3265.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1892.03   CHANNEL SLOPE =  0.3086
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.113
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.96      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.26
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   3.41
  Tc(MIN.) =   19.29
  SUBAREA AREA(ACRES) =    68.96       SUBAREA RUNOFF(CFS) =   38.05
  EFFECTIVE AREA(ACRES) =     96.81     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       96.8         PEAK FLOW RATE(CFS) =      53.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =  10.15
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12003.00 =    3833.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3265.69  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3118.62   CHANNEL SLOPE =  0.2688
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.988
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.28      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     126.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.90
  AVERAGE FLOW DEPTH(FEET) =   1.88   TRAVEL TIME(MIN.) =   4.37
  Tc(MIN.) =   23.66
  SUBAREA AREA(ACRES) =   328.28       SUBAREA RUNOFF(CFS) =  144.17
  EFFECTIVE AREA(ACRES) =    425.09     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      425.1         PEAK FLOW RATE(CFS) =     186.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.18   FLOW VELOCITY(FEET/SEC.) =  13.13
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.66
  RAINFALL INTENSITY(INCH/HR) =   0.99
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     425.09
  TOTAL STREAM AREA(ACRES) =     425.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     186.68

****************************************************************************
  FLOW PROCESS FROM NODE  12010.00 TO NODE  12011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   264.80
  ELEVATION DATA: UPSTREAM(FEET) =   4208.12  DOWNSTREAM(FEET) =   4068.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.470
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.099
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.06      0.50     1.000     0    7.47
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.96
  TOTAL AREA(ACRES) =      2.06   PEAK FLOW RATE(CFS) =      2.96

****************************************************************************
  FLOW PROCESS FROM NODE  12011.00 TO NODE  12012.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4068.13  DOWNSTREAM(FEET) =   3694.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.45   CHANNEL SLOPE =  0.5703
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.851
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.98      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.17
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   1.52
  Tc(MIN.) =    8.99
  SUBAREA AREA(ACRES) =     3.98       SUBAREA RUNOFF(CFS) =    4.84
  EFFECTIVE AREA(ACRES) =      6.04     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =       7.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   7.76
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12012.00 =     919.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12012.00 TO NODE  12013.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3694.92  DOWNSTREAM(FEET) =   3415.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   981.94   CHANNEL SLOPE =  0.2845
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.602
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.56      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.07
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   2.03
  Tc(MIN.) =   11.02
  SUBAREA AREA(ACRES) =    35.56       SUBAREA RUNOFF(CFS) =   35.26
  EFFECTIVE AREA(ACRES) =     41.60     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.6         PEAK FLOW RATE(CFS) =      41.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   9.18
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12013.00 =    1901.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12013.00 TO NODE  12014.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3415.55  DOWNSTREAM(FEET) =   2756.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.68   CHANNEL SLOPE =  0.3420
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.365
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.40      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.21
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =   13.88
  SUBAREA AREA(ACRES) =    72.40       SUBAREA RUNOFF(CFS) =   56.37
```



```
  EFFECTIVE AREA(ACRES) =    114.00     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.0         PEAK FLOW RATE(CFS) =      88.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.57   FLOW VELOCITY(FEET/SEC.) =  11.93
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12014.00 =    3827.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2756.62  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1697.28   CHANNEL SLOPE =  0.1940
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.215
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      121.96      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     128.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.57
  AVERAGE FLOW DEPTH(FEET) =   2.01   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   16.56
  SUBAREA AREA(ACRES) =   121.96       SUBAREA RUNOFF(CFS) =   78.46
  EFFECTIVE AREA(ACRES) =    235.96     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      236.0         PEAK FLOW RATE(CFS) =     151.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.14   FLOW VELOCITY(FEET/SEC.) =  11.04
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12020.00 =    5525.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.56
  RAINFALL INTENSITY(INCH/HR) =   1.22
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     235.96
  TOTAL STREAM AREA(ACRES) =     235.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     151.80

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
    1      186.68   23.66    0.988  0.50( 0.50) 1.00     425.1   12000.00
    2      151.80   16.56    1.215  0.50( 0.50) 1.00     236.0   12010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      338.48   16.56    1.215  0.50( 0.50) 1.00     533.5   12010.00
    2      290.30   23.66    0.988  0.50( 0.50) 1.00     661.0   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     338.48    Tc(MIN.) =    16.56
  EFFECTIVE AREA(ACRES) =     533.45   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      661.0
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12020.00 TO NODE  12021.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2427.28  DOWNSTREAM(FEET) =   2056.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2698.04   CHANNEL SLOPE =  0.1375
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.084
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      376.13      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     437.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.63
  AVERAGE FLOW DEPTH(FEET) =   3.40   TRAVEL TIME(MIN.) =   3.56
  Tc(MIN.) =   20.12
  SUBAREA AREA(ACRES) =   376.13       SUBAREA RUNOFF(CFS) =  197.55
  EFFECTIVE AREA(ACRES) =    909.58     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1037.2         PEAK FLOW RATE(CFS) =     477.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.51   FLOW VELOCITY(FEET/SEC.) =  12.91
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12021.00 =    9650.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12021.00 TO NODE  12022.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2056.25  DOWNSTREAM(FEET) =   1864.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2552.86   CHANNEL SLOPE =  0.0750
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```



```
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.976
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      347.45      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     552.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.66
  AVERAGE FLOW DEPTH(FEET) =   4.16   TRAVEL TIME(MIN.) =   3.99
  Tc(MIN.) =   24.11
  SUBAREA AREA(ACRES) =   347.45       SUBAREA RUNOFF(CFS) =  148.79
  EFFECTIVE AREA(ACRES) =   1257.03     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1384.6         PEAK FLOW RATE(CFS) =     538.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.12   FLOW VELOCITY(FEET/SEC.) =  10.60
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12022.00 =   12203.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12022.00 TO NODE  12023.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1864.68  DOWNSTREAM(FEET) =   1710.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.57   CHANNEL SLOPE =  0.0816
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.917
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      280.70      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     590.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.20
  AVERAGE FLOW DEPTH(FEET) =   4.19   TRAVEL TIME(MIN.) =   2.81
  Tc(MIN.) =   26.92
  SUBAREA AREA(ACRES) =   280.70       SUBAREA RUNOFF(CFS) =  105.23
  EFFECTIVE AREA(ACRES) =   1537.73     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1665.3         PEAK FLOW RATE(CFS) =     576.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.16   FLOW VELOCITY(FEET/SEC.) =  11.13
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12023.00 =   14089.73 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1710.75  DOWNSTREAM(FEET) =   1672.60
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.87   CHANNEL SLOPE =  0.0196
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.837
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      248.35      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     614.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.62
  AVERAGE FLOW DEPTH(FEET) =   5.56   TRAVEL TIME(MIN.) =   4.89
  Tc(MIN.) =   31.81
  SUBAREA AREA(ACRES) =   248.35       SUBAREA RUNOFF(CFS) =   75.20
  EFFECTIVE AREA(ACRES) =   1786.08     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1913.7         PEAK FLOW RATE(CFS) =     576.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.43   FLOW VELOCITY(FEET/SEC.) =   6.52
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12024.00 =   16034.60 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1913.7  TC(MIN.) =     31.81
  EFFECTIVE AREA(ACRES) =   1786.08  AREA-AVERAGED Fm(INCH/HR)=  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     576.45

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      576.45   31.81    0.837  0.50( 0.50) 1.00    1786.1   12010.00
      2      449.73   39.85    0.733  0.50( 0.50) 1.00    1913.7   12000.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




------------------------------------------------------------------------------
  FILE NAME: S21.DAT
  TIME/DATE OF STUDY: 14:04 04/03/2013
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.503
   2)   10.00;  1.686
   3)   15.00;  1.273
   4)   20.00;  1.087
   5)   25.00;  0.952
   6)   30.00;  0.860
   7)   40.00;  0.731
   8)   50.00;  0.649
   9)   60.00;  0.586
  10)   90.00;  0.482
  11)  120.00;  0.421
  12)  180.00;  0.350
  13)  360.00;  0.253
  14) 1440.00;  0.110
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
******************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 15.1
------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S20.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      576.45   31.81  0.50( 0.50) 1.00    1786.1   12010.00
      2      449.73   39.85  0.50( 0.50) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =     1913.7

******************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 14.0
------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      576.45   31.81  0.50( 0.50) 1.00    1786.1   12010.00
      2      449.73   39.85  0.50( 0.50) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =      1913.7

******************************************************************************
  FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1672.60  DOWNSTREAM(FEET) =   1636.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   780.49   CHANNEL SLOPE =  0.0458
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.818
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       93.19      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     589.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.01
  AVERAGE FLOW DEPTH(FEET) =   4.67   TRAVEL TIME(MIN.) =   1.44
  Tc(MIN.) =   33.26
  SUBAREA AREA(ACRES) =    93.19       SUBAREA RUNOFF(CFS) =   26.65
  EFFECTIVE AREA(ACRES) =   1879.27     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.9          PEAK FLOW RATE(CFS) =     576.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.63   FLOW VELOCITY(FEET/SEC.) =   8.97
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

******************************************************************************
```

```
 FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   33.26
 RAINFALL INTENSITY(INCH/HR) =   0.82
 AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    1879.27
 TOTAL STREAM AREA(ACRES) =    2006.87
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     576.45

****************************************************************************
 FLOW PROCESS FROM NODE  12101.10 TO NODE  12101.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   847.57
 ELEVATION DATA: UPSTREAM(FEET) =   3435.00  DOWNSTREAM(FEET) =   2774.23

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.008
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.603
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        6.56      0.50     1.000     0   11.01
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      6.51
 TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =      6.51

****************************************************************************
 FLOW PROCESS FROM NODE  12101.20 TO NODE  12101.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2774.23  DOWNSTREAM(FEET) =   2097.09
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1205.19   CHANNEL SLOPE =  0.5619
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.437
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       34.88      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.02
 AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =   2.01
 Tc(MIN.) =   13.01
```



```
 SUBAREA AREA(ACRES) =    34.88       SUBAREA RUNOFF(CFS) =   29.41
 EFFECTIVE AREA(ACRES) =     41.44     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       41.4          PEAK FLOW RATE(CFS) =      34.94

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.01   FLOW VELOCITY(FEET/SEC.) =  11.38
 LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12101.30 =    2052.76 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2097.09  DOWNSTREAM(FEET) =   1636.82
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1553.74   CHANNEL SLOPE =  0.2962
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.250
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       56.40      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.03
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.95
 AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   2.60
 Tc(MIN.) =   15.62
 SUBAREA AREA(ACRES) =    56.40       SUBAREA RUNOFF(CFS) =   38.06
 EFFECTIVE AREA(ACRES) =     97.84     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       97.8          PEAK FLOW RATE(CFS) =      66.03

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =  10.52
 LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12102.00 =    3606.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   15.62
 RAINFALL INTENSITY(INCH/HR) =   1.25
 AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =      97.84
 TOTAL STREAM AREA(ACRES) =      97.84
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      66.03

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      576.45   33.26    0.818  0.50( 0.50) 1.00    1879.3   12010.00
    1      449.73   41.39    0.720  0.50( 0.50) 1.00    2006.9   12000.00
    2       66.03   15.62    1.250  0.50( 0.50) 1.00      97.8   12101.10

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      642.48   15.62    1.250  0.50( 0.50) 1.00     980.4   12101.10
    2      604.43   33.26    0.818  0.50( 0.50) 1.00    1977.1   12010.00
    3      469.06   41.39    0.720  0.50( 0.50) 1.00    2104.7   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     642.48    Tc(MIN.) =    15.62
  EFFECTIVE AREA(ACRES) =     980.36   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2104.7
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12102.00 TO NODE  12103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1636.82  DOWNSTREAM(FEET) =   1558.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2049.75   CHANNEL SLOPE =  0.0382
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.104
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.59      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     674.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.71
  AVERAGE FLOW DEPTH(FEET) =   5.08   TRAVEL TIME(MIN.) =   3.92
  Tc(MIN.) =   19.54
  SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =   63.38
  EFFECTIVE AREA(ACRES) =   1096.95     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2221.3         PEAK FLOW RATE(CFS) =     642.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.99   FLOW VELOCITY(FEET/SEC.) =   8.59
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12103.00 =   18864.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12103.00 TO NODE  12104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1558.46  DOWNSTREAM(FEET) =   1453.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1971.34   CHANNEL SLOPE =  0.0531
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.011
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      355.30      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     724.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.02
  AVERAGE FLOW DEPTH(FEET) =   4.91   TRAVEL TIME(MIN.) =   3.28
  Tc(MIN.) =   22.82
  SUBAREA AREA(ACRES) =   355.30       SUBAREA RUNOFF(CFS) =  163.32
  EFFECTIVE AREA(ACRES) =   1452.25     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2576.6         PEAK FLOW RATE(CFS) =     667.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.76   FLOW VELOCITY(FEET/SEC.) =   9.83
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12104.00 =   20836.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12104.00 TO NODE  12105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1453.87  DOWNSTREAM(FEET) =   1369.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1885.63   CHANNEL SLOPE =  0.0446
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.930
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      200.37      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     706.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.33
  AVERAGE FLOW DEPTH(FEET) =   5.02   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   26.18
  SUBAREA AREA(ACRES) =   200.37       SUBAREA RUNOFF(CFS) =   77.55
  EFFECTIVE AREA(ACRES) =   1652.62     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2777.0         PEAK FLOW RATE(CFS) =     667.57
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.92   FLOW VELOCITY(FEET/SEC.) =   9.20
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12105.00 =   22721.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12105.00 TO NODE  12106.00 IS CODE =  51
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1369.72  DOWNSTREAM(FEET) =   1298.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1910.12   CHANNEL SLOPE =  0.0374
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.864
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.52      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     723.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.78
  AVERAGE FLOW DEPTH(FEET) =   5.24   TRAVEL TIME(MIN.) =   3.62
  Tc(MIN.) =   29.81
  SUBAREA AREA(ACRES) =   339.52       SUBAREA RUNOFF(CFS) =  111.02
  EFFECTIVE AREA(ACRES) =   1992.14     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3116.5         PEAK FLOW RATE(CFS) =     667.57
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.08   FLOW VELOCITY(FEET/SEC.) =   8.61
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12106.00 =   24631.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1298.29  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2982.44   CHANNEL SLOPE =  0.0277
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.780
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      164.97      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     688.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.75
  AVERAGE FLOW DEPTH(FEET) =   5.44   TRAVEL TIME(MIN.) =   6.42
  Tc(MIN.) =   36.23
  SUBAREA AREA(ACRES) =   164.97       SUBAREA RUNOFF(CFS) =   41.50
  EFFECTIVE AREA(ACRES) =   2157.11     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3281.5         PEAK FLOW RATE(CFS) =     667.57
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.38   FLOW VELOCITY(FEET/SEC.) =   7.70
```



```
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   36.23
  RAINFALL INTENSITY(INCH/HR) =   0.78
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2157.11
  TOTAL STREAM AREA(ACRES) =    3281.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     667.57

****************************************************************************
  FLOW PROCESS FROM NODE  12111.00 TO NODE  12112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   939.51
  ELEVATION DATA: UPSTREAM(FEET) =   3108.05  DOWNSTREAM(FEET) =   2753.95

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.265
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.416
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.25      0.50     1.000     0   13.27
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.80
  TOTAL AREA(ACRES) =      8.25   PEAK FLOW RATE(CFS) =      6.80

****************************************************************************
  FLOW PROCESS FROM NODE  12112.00 TO NODE  12113.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2753.95  DOWNSTREAM(FEET) =   2458.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =   945.14   CHANNEL SLOPE =  0.3127
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.255
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.51      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.42
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.06
  AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   15.50
  SUBAREA AREA(ACRES) =    16.51       SUBAREA RUNOFF(CFS) =   11.21
  EFFECTIVE AREA(ACRES) =     24.76     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.8         PEAK FLOW RATE(CFS) =      16.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   7.62
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12113.00 =    1884.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12113.00 TO NODE  12114.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2458.45  DOWNSTREAM(FEET) =   1823.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.76   CHANNEL SLOPE =  0.3336
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.127
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       57.98      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.23
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   18.94
  SUBAREA AREA(ACRES) =    57.98       SUBAREA RUNOFF(CFS) =   32.69
  EFFECTIVE AREA(ACRES) =     82.74     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       82.7         PEAK FLOW RATE(CFS) =      46.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.24   FLOW VELOCITY(FEET/SEC.) =  10.10
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12114.00 =    3788.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12114.00 TO NODE  12115.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1823.37  DOWNSTREAM(FEET) =   1500.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.04   CHANNEL SLOPE =  0.1916
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.034
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.07      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
```



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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.25
  AVERAGE FLOW DEPTH(FEET) =   1.66   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   21.97
  SUBAREA AREA(ACRES) =   124.07       SUBAREA RUNOFF(CFS) =   59.58
  EFFECTIVE AREA(ACRES) =    206.81     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.8         PEAK FLOW RATE(CFS) =      99.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =   9.84
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12115.00 =    5473.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1500.53  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.45   CHANNEL SLOPE =  0.1519
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.946
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.55      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     111.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.31
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   3.36
  Tc(MIN.) =   25.33
  SUBAREA AREA(ACRES) =    62.55       SUBAREA RUNOFF(CFS) =   25.09
  EFFECTIVE AREA(ACRES) =    269.36     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      269.4         PEAK FLOW RATE(CFS) =     108.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.97   FLOW VELOCITY(FEET/SEC.) =   9.25
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12121.00 =    7348.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.33
  RAINFALL INTENSITY(INCH/HR) =   0.95
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     269.36
```

```
 TOTAL STREAM AREA(ACRES) =     269.36
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     108.05

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      667.57   36.23    0.780  0.50( 0.50) 1.00    2157.1   12101.10
     1      604.43   54.46    0.621  0.50( 0.50) 1.00    3153.9   12010.00
     1      469.06   64.02    0.572  0.50( 0.50) 1.00    3281.5   12000.00
     2      108.05   25.33    0.946  0.50( 0.50) 1.00     269.4   12111.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      775.62   25.33    0.946  0.50( 0.50) 1.00    1777.7   12111.00
     2      735.32   36.23    0.780  0.50( 0.50) 1.00    2426.5   12101.10
     3      633.69   54.46    0.621  0.50( 0.50) 1.00    3423.2   12010.00
     4      486.47   64.02    0.572  0.50( 0.50) 1.00    3550.8   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     775.62    Tc(MIN.) =    25.33
 EFFECTIVE AREA(ACRES) =    1777.69   AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3550.8
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12121.00 TO NODE  12241.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1215.72  DOWNSTREAM(FEET) =   1122.29
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3397.13   CHANNEL SLOPE =  0.0275
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.829
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      136.41      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     795.83
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.02
 AVERAGE FLOW DEPTH(FEET) =   5.75   TRAVEL TIME(MIN.) =   7.06
 Tc(MIN.) =   32.39
 SUBAREA AREA(ACRES) =   136.41       SUBAREA RUNOFF(CFS) =   40.39
 EFFECTIVE AREA(ACRES) =   1914.10     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3687.2         PEAK FLOW RATE(CFS) =     775.62
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.70   FLOW VELOCITY(FEET/SEC.) =   7.97
```



```
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     3687.2  TC(MIN.) =     32.39
 EFFECTIVE AREA(ACRES) =   1914.10  AREA-AVERAGED Fm(INCH/HR)=  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =     775.62

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      775.62   32.39    0.829  0.50( 0.50) 1.00    1914.1   12111.00
     2      735.32   43.40    0.703  0.50( 0.50) 1.00    2562.9   12101.10
     3      633.69   61.93    0.579  0.50( 0.50) 1.00    3559.6   12010.00
     4      486.47   72.00    0.544  0.50( 0.50) 1.00    3687.2   12000.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:
```

```
  FILE NAME: S22.DAT
  TIME/DATE OF STUDY: 14:04 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.503
   2)   10.00;  1.686
   3)   15.00;  1.273
   4)   20.00;  1.087
   5)   25.00;  0.952
   6)   30.00;  0.860
   7)   40.00;  0.731
   8)   50.00;  0.649
   9)   60.00;  0.586
  10)   90.00;  0.482
  11)  120.00;  0.421
  12)  180.00;  0.350
  13)  360.00;  0.253
  14) 1440.00;  0.110
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12201.00 TO NODE  12202.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   926.94
  ELEVATION DATA: UPSTREAM(FEET) =   3077.00  DOWNSTREAM(FEET) =   2740.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.295
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.414
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.74      0.50     1.000     0   13.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.72
  TOTAL AREA(ACRES) =      5.74   PEAK FLOW RATE(CFS) =      4.72

**************************************************************************
  FLOW PROCESS FROM NODE  12202.00 TO NODE  12203.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2740.64  DOWNSTREAM(FEET) =   2551.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   832.53   CHANNEL SLOPE =  0.2271
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.251
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.85      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.07
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =   15.58
  SUBAREA AREA(ACRES) =    18.85       SUBAREA RUNOFF(CFS) =   12.75
  EFFECTIVE AREA(ACRES) =     24.59     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.6         PEAK FLOW RATE(CFS) =      16.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   6.77
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12203.00 =    1759.47 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12203.00 TO NODE  12204.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2551.60  DOWNSTREAM(FEET) =   2151.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.86   CHANNEL SLOPE =  0.1944
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.090
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.93      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.88
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   4.35
  Tc(MIN.) =   19.93
  SUBAREA AREA(ACRES) =    83.93       SUBAREA RUNOFF(CFS) =   44.52
  EFFECTIVE AREA(ACRES) =    108.52     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      108.5         PEAK FLOW RATE(CFS) =      57.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.49   FLOW VELOCITY(FEET/SEC.) =   8.64
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12204.00 =    3816.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12204.00 TO NODE  12205.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2151.76  DOWNSTREAM(FEET) =   1788.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2363.99   CHANNEL SLOPE =  0.1538
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.971
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      182.26      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      96.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.02
  AVERAGE FLOW DEPTH(FEET) =   1.89   TRAVEL TIME(MIN.) =   4.37
  Tc(MIN.) =   24.30
  SUBAREA AREA(ACRES) =   182.26       SUBAREA RUNOFF(CFS) =   77.21
  EFFECTIVE AREA(ACRES) =    290.78     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      290.8         PEAK FLOW RATE(CFS) =     123.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.07   FLOW VELOCITY(FEET/SEC.) =   9.58
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12205.00 =    6180.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12205.00 TO NODE  12206.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1788.16  DOWNSTREAM(FEET) =   1385.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2825.33   CHANNEL SLOPE =  0.1424
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.876
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      153.05      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     149.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.77
  AVERAGE FLOW DEPTH(FEET) =   2.26   TRAVEL TIME(MIN.) =   4.82
  Tc(MIN.) =   29.12
  SUBAREA AREA(ACRES) =   153.05       SUBAREA RUNOFF(CFS) =   51.79
  EFFECTIVE AREA(ACRES) =    443.83     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      443.8         PEAK FLOW RATE(CFS) =     150.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.26   FLOW VELOCITY(FEET/SEC.) =   9.79
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12206.00 =    9005.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1385.78  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3579.23   CHANNEL SLOPE =  0.1061
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.786
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.52      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     167.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.99
  AVERAGE FLOW DEPTH(FEET) =   2.49   TRAVEL TIME(MIN.) =   6.63
  Tc(MIN.) =   35.75
  SUBAREA AREA(ACRES) =   132.52       SUBAREA RUNOFF(CFS) =   34.06
  EFFECTIVE AREA(ACRES) =    576.35     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      576.4         PEAK FLOW RATE(CFS) =     150.20
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.39   FLOW VELOCITY(FEET/SEC.) =   8.76
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   35.75
 RAINFALL INTENSITY(INCH/HR) =   0.79
 AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     576.35
 TOTAL STREAM AREA(ACRES) =     576.35
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     150.20

****************************************************************************
 FLOW PROCESS FROM NODE  12211.00 TO NODE  12212.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   733.41
 ELEVATION DATA: UPSTREAM(FEET) =   1669.93  DOWNSTREAM(FEET) =   1536.26

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.893
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.364
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "GRASS"                    -        8.90      0.50     1.000     0   13.89
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      6.92
 TOTAL AREA(ACRES) =      8.90   PEAK FLOW RATE(CFS) =      6.92

****************************************************************************
 FLOW PROCESS FROM NODE  12212.00 TO NODE  12213.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1536.26  DOWNSTREAM(FEET) =   1416.02
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1253.05   CHANNEL SLOPE =  0.0960
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.141
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       17.91      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.14
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.49
 AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   4.65
 Tc(MIN.) =   18.54
```



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 SUBAREA AREA(ACRES) =    17.91       SUBAREA RUNOFF(CFS) =   10.33
 EFFECTIVE AREA(ACRES) =     26.81     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       26.8         PEAK FLOW RATE(CFS) =      15.47

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =   4.76
 LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12213.00 =    1986.46 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12213.00 TO NODE  12214.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1416.02  DOWNSTREAM(FEET) =   1234.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1877.62   CHANNEL SLOPE =  0.0966
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.990
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      125.19      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.41
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.19
 AVERAGE FLOW DEPTH(FEET) =   1.53   TRAVEL TIME(MIN.) =   5.05
 Tc(MIN.) =   23.59
 SUBAREA AREA(ACRES) =   125.19       SUBAREA RUNOFF(CFS) =   55.18
 EFFECTIVE AREA(ACRES) =    152.00     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      152.0         PEAK FLOW RATE(CFS) =      67.00

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.80   FLOW VELOCITY(FEET/SEC.) =   6.93
 LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12214.00 =    3864.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1234.66  DOWNSTREAM(FEET) =   1006.12
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2510.91   CHANNEL SLOPE =  0.0910
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.881
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      339.35      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     125.53
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.91
```

```
  AVERAGE FLOW DEPTH(FEET) =   2.30   TRAVEL TIME(MIN.) =   5.29
  Tc(MIN.) =   28.88
  SUBAREA AREA(ACRES) =   339.35       SUBAREA RUNOFF(CFS) =  116.17
  EFFECTIVE AREA(ACRES) =    491.35     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      491.4          PEAK FLOW RATE(CFS) =     168.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.57   FLOW VELOCITY(FEET/SEC.) =   8.51
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12221.00 =    6374.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.88
  RAINFALL INTENSITY(INCH/HR) =   0.88
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     491.35
  TOTAL STREAM AREA(ACRES) =     491.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     168.20

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      150.20   35.75    0.786  0.50( 0.50) 1.00     576.4   12201.00
      2      168.20   28.88    0.881  0.50( 0.50) 1.00     491.4   12211.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      318.40   28.88    0.881  0.50( 0.50) 1.00     957.0   12211.00
      2      276.49   35.75    0.786  0.50( 0.50) 1.00    1067.7   12201.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     318.40    Tc(MIN.) =    28.88
  EFFECTIVE AREA(ACRES) =     956.95   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1067.7
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1006.12  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.84   CHANNEL SLOPE =  0.0459
```



```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.810
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.60      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     336.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.84
  AVERAGE FLOW DEPTH(FEET) =   3.78   TRAVEL TIME(MIN.) =   5.02
  Tc(MIN.) =   33.91
  SUBAREA AREA(ACRES) =   127.60       SUBAREA RUNOFF(CFS) =   35.53
  EFFECTIVE AREA(ACRES) =   1084.55     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1195.3         PEAK FLOW RATE(CFS) =     318.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.71   FLOW VELOCITY(FEET/SEC.) =   7.73
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12231.00 TO NODE  12231.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   553.71
  ELEVATION DATA: UPSTREAM(FEET) =   2687.04  DOWNSTREAM(FEET) =   2470.68

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.660
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.632
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        3.48      0.50     1.000     0   10.66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.54
  TOTAL AREA(ACRES) =      3.48   PEAK FLOW RATE(CFS) =      3.54

****************************************************************************
  FLOW PROCESS FROM NODE  12231.50 TO NODE  12232.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2470.68  DOWNSTREAM(FEET) =   2375.54
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.38   CHANNEL SLOPE =  0.2318
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.535
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       12.43      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.88
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   1.16
  Tc(MIN.) =   11.82
  SUBAREA AREA(ACRES) =    12.43       SUBAREA RUNOFF(CFS) =   11.58
  EFFECTIVE AREA(ACRES) =     15.91     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       15.9         PEAK FLOW RATE(CFS) =      14.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   6.58
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12232.00 =     964.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12232.00 TO NODE  12233.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2375.54  DOWNSTREAM(FEET) =   2252.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =   939.16   CHANNEL SLOPE =  0.1305
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.314
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.65      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.83
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   14.51
  SUBAREA AREA(ACRES) =    17.65       SUBAREA RUNOFF(CFS) =   12.92
  EFFECTIVE AREA(ACRES) =     33.56     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.6         PEAK FLOW RATE(CFS) =      24.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.16   FLOW VELOCITY(FEET/SEC.) =   6.04
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12233.00 =    1903.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12233.00 TO NODE  12234.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2252.99  DOWNSTREAM(FEET) =   2163.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.53   CHANNEL SLOPE =  0.0921
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.183
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       19.54      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.57
  AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   2.92
  Tc(MIN.) =   17.43
  SUBAREA AREA(ACRES) =    19.54       SUBAREA RUNOFF(CFS) =   12.00
  EFFECTIVE AREA(ACRES) =     53.10     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       53.1         PEAK FLOW RATE(CFS) =      32.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   5.68
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12234.00 =    2879.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12234.00 TO NODE  12235.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2163.07  DOWNSTREAM(FEET) =   2018.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.65   CHANNEL SLOPE =  0.0759
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.005
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.14      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.68
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   5.60
  Tc(MIN.) =   23.03
  SUBAREA AREA(ACRES) =    51.14       SUBAREA RUNOFF(CFS) =   23.24
  EFFECTIVE AREA(ACRES) =    104.24     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =      47.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.65   FLOW VELOCITY(FEET/SEC.) =   5.79
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12235.00 =    4789.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12235.00 TO NODE  12236.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2018.08  DOWNSTREAM(FEET) =   1607.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.94   CHANNEL SLOPE =  0.2162
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.924
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.99
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   3.52
  Tc(MIN.) =   26.55
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   18.07
  EFFECTIVE AREA(ACRES) =    151.68     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =      57.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.46   FLOW VELOCITY(FEET/SEC.) =   9.01
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12236.00 =    6686.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12236.00 TO NODE  12237.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1607.89  DOWNSTREAM(FEET) =   1326.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2213.20   CHANNEL SLOPE =  0.1273
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.844
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.00      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      71.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.81
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   4.73
  Tc(MIN.) =   31.27
  SUBAREA AREA(ACRES) =    87.00       SUBAREA RUNOFF(CFS) =   26.89
  EFFECTIVE AREA(ACRES) =    238.68     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      238.7         PEAK FLOW RATE(CFS) =      73.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =   7.87
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12237.00 =    8899.57 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1326.23  DOWNSTREAM(FEET) =   1122.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2236.51   CHANNEL SLOPE =  0.0912
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.776
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       81.83      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      83.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.15
  AVERAGE FLOW DEPTH(FEET) =   1.98   TRAVEL TIME(MIN.) =   5.22
  Tc(MIN.) =   36.49
  SUBAREA AREA(ACRES) =    81.83       SUBAREA RUNOFF(CFS) =   20.33
  EFFECTIVE AREA(ACRES) =    320.51     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      320.5         PEAK FLOW RATE(CFS) =      79.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.94   FLOW VELOCITY(FEET/SEC.) =   7.09
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S21.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      775.62   32.39  0.50( 0.50) 1.00    1914.1   12111.00
      2      735.32   43.40  0.50( 0.50) 1.00    2562.9   12101.10
      3      633.69   61.93  0.50( 0.50) 1.00    3559.6   12010.00
      4      486.47   72.00  0.50( 0.50) 1.00    3687.2   12000.00
    TOTAL AREA(ACRES) =     3687.2

****************************************************************************
  FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
```

```
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      775.62   32.39  0.50( 0.50) 1.00    1914.1   12111.00
     2      735.32   43.40  0.50( 0.50) 1.00    2562.9   12101.10
     3      633.69   61.93  0.50( 0.50) 1.00    3559.6   12010.00
     4      486.47   72.00  0.50( 0.50) 1.00    3687.2   12000.00
   TOTAL AREA(ACRES) =      3687.2

****************************************************************************
  FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      775.62   32.39    0.829  0.50( 0.50) 1.00    1914.1   12111.00
     2      735.32   43.40    0.703  0.50( 0.50) 1.00    2562.9   12101.10
     3      633.69   61.93    0.579  0.50( 0.50) 1.00    3559.6   12010.00
     4      486.47   72.00    0.544  0.50( 0.50) 1.00    3687.2   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       79.64   36.49    0.776  0.50( 0.50) 1.00     320.5   12231.00
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      855.26   32.39    0.829  0.50( 0.50) 1.00    2198.6   12111.00
     2      840.24   36.49    0.776  0.50( 0.50) 1.00    2476.5   12231.00
     3      793.87   43.40    0.703  0.50( 0.50) 1.00    2883.4   12101.10
     4      656.51   61.93    0.579  0.50( 0.50) 1.00    3880.1   12010.00
     5      499.22   72.00    0.544  0.50( 0.50) 1.00    4007.7   12000.00
   TOTAL AREA(ACRES) =      4007.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      855.26  Tc(MIN.) =   32.386
  EFFECTIVE AREA(ACRES) =   2198.57  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     4007.7
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12241.00 TO NODE  12242.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1122.29  DOWNSTREAM(FEET) =   1062.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.03   CHANNEL SLOPE =  0.0291
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.777
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      219.09      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     882.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.41
  AVERAGE FLOW DEPTH(FEET) =   5.92   TRAVEL TIME(MIN.) =   4.07
  Tc(MIN.) =   36.46
  SUBAREA AREA(ACRES) =   219.09       SUBAREA RUNOFF(CFS) =   54.52
  EFFECTIVE AREA(ACRES) =   2417.66     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4226.8         PEAK FLOW RATE(CFS) =     855.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.85   FLOW VELOCITY(FEET/SEC.) =   8.34
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12242.00 =   33064.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12242.00 TO NODE  12243.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1062.50  DOWNSTREAM(FEET) =    998.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.30   CHANNEL SLOPE =  0.0331
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.730
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      249.96      0.50     0.995     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     881.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.82
  AVERAGE FLOW DEPTH(FEET) =   5.77   TRAVEL TIME(MIN.) =   3.65
  Tc(MIN.) =   40.10
  SUBAREA AREA(ACRES) =   249.96       SUBAREA RUNOFF(CFS) =   52.29
  EFFECTIVE AREA(ACRES) =   2667.62     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4476.8         PEAK FLOW RATE(CFS) =     855.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.70   FLOW VELOCITY(FEET/SEC.) =   8.76
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12243.00 =   34995.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12243.00 TO NODE  12244.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    998.53  DOWNSTREAM(FEET) =    926.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1863.28   CHANNEL SLOPE =  0.0389
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```

```
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.703
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      166.97      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     870.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.34
  AVERAGE FLOW DEPTH(FEET) =   5.57   TRAVEL TIME(MIN.) =   3.32
  Tc(MIN.) =   43.43
  SUBAREA AREA(ACRES) =   166.97       SUBAREA RUNOFF(CFS) =   30.46
  EFFECTIVE AREA(ACRES) =   2834.59     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4643.8         PEAK FLOW RATE(CFS) =     855.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.54   FLOW VELOCITY(FEET/SEC.) =   9.30
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12244.00 =   36859.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12244.00 TO NODE  12251.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    926.00  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1665.37   CHANNEL SLOPE =  0.0170
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.670
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.41      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     861.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.84
  AVERAGE FLOW DEPTH(FEET) =   6.48   TRAVEL TIME(MIN.) =   4.06
  Tc(MIN.) =   47.49
  SUBAREA AREA(ACRES) =    83.41       SUBAREA RUNOFF(CFS) =   12.72
  EFFECTIVE AREA(ACRES) =   2918.00     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4727.2         PEAK FLOW RATE(CFS) =     855.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.47   FLOW VELOCITY(FEET/SEC.) =   6.82
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```



```
  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      855.26   47.49    0.670  0.50( 0.50) 1.00    2918.0   12111.00
      2      840.24   51.67    0.638  0.50( 0.50) 1.00    3195.9   12231.00
      3      793.87   58.81    0.594  0.50( 0.50) 1.00    3602.8   12101.10
      4      656.51   78.13    0.523  0.50( 0.50) 1.00    4599.6   12010.00
      5      499.22   89.38    0.484  0.50( 0.50) 1.00    4727.2   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      318.40   33.91    0.810  0.50( 0.50) 1.00    1084.6   12211.00
      2      276.49   40.97    0.723  0.50( 0.50) 1.00    1195.3   12201.00
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1173.66   33.91    0.810  0.50( 0.50) 1.00    3168.0   12211.00
      2     1131.75   40.97    0.723  0.50( 0.50) 1.00    3712.9   12201.00
      3     1065.44   47.49    0.670  0.50( 0.50) 1.00    4113.3   12111.00
      4     1011.81   51.67    0.638  0.50( 0.50) 1.00    4391.2   12231.00
      5      909.64   58.81    0.594  0.50( 0.50) 1.00    4798.1   12101.10
      6      685.00   78.13    0.523  0.50( 0.50) 1.00    5794.9   12010.00
      7      499.21   89.38    0.484  0.50( 0.50) 1.00    5922.5   12000.00
    TOTAL AREA(ACRES) =      5922.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1173.66  Tc(MIN.) =   33.907
  EFFECTIVE AREA(ACRES) =   3168.01  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5922.5
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    897.69  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2133.08   CHANNEL SLOPE =  0.0238
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.755
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.79      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1183.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.39
  AVERAGE FLOW DEPTH(FEET) =   6.86   TRAVEL TIME(MIN.) =   4.24
  Tc(MIN.) =   38.14
```

```
  SUBAREA AREA(ACRES) =    85.79       SUBAREA RUNOFF(CFS) =   19.67
  EFFECTIVE AREA(ACRES) =   3253.80     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6008.3         PEAK FLOW RATE(CFS) =    1173.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.84   FLOW VELOCITY(FEET/SEC.) =   8.36
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12281.00 =   40657.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   38.14
  RAINFALL INTENSITY(INCH/HR) =   0.75
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3253.80
  TOTAL STREAM AREA(ACRES) =    6008.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1173.66

****************************************************************************
  FLOW PROCESS FROM NODE  12261.00 TO NODE  12261.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   378.71
  ELEVATION DATA: UPSTREAM(FEET) =   2264.27  DOWNSTREAM(FEET) =   2072.51

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.694
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.899
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.96      0.50     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.73
  TOTAL AREA(ACRES) =      2.96   PEAK FLOW RATE(CFS) =      3.73

****************************************************************************
  FLOW PROCESS FROM NODE  12261.50 TO NODE  12262.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2072.51  DOWNSTREAM(FEET) =   1875.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   609.41   CHANNEL SLOPE =  0.3233
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```



```
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.666
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.89      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.55
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   1.55
  Tc(MIN.) =   10.24
  SUBAREA AREA(ACRES) =     9.89       SUBAREA RUNOFF(CFS) =   10.37
  EFFECTIVE AREA(ACRES) =     12.85     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.9         PEAK FLOW RATE(CFS) =      13.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   7.33
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12262.00 =     988.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12262.00 TO NODE  12263.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1875.51  DOWNSTREAM(FEET) =   1686.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.89   CHANNEL SLOPE =  0.1957
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.473
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.00      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.92
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   2.33
  Tc(MIN.) =   12.58
  SUBAREA AREA(ACRES) =    22.00       SUBAREA RUNOFF(CFS) =   19.27
  EFFECTIVE AREA(ACRES) =     34.85     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.8         PEAK FLOW RATE(CFS) =      30.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   7.41
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12263.00 =    1956.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12263.00 TO NODE  12264.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1686.10  DOWNSTREAM(FEET) =   1572.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.28   CHANNEL SLOPE =  0.1198
```

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  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.280
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.72      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.72
  AVERAGE FLOW DEPTH(FEET) =   1.46   TRAVEL TIME(MIN.) =   2.34
  Tc(MIN.) =   14.92
  SUBAREA AREA(ACRES) =    35.72       SUBAREA RUNOFF(CFS) =   25.07
  EFFECTIVE AREA(ACRES) =     70.57     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =      49.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.54   FLOW VELOCITY(FEET/SEC.) =   6.98
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12264.00 =    2900.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12264.00 TO NODE  12265.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1572.93  DOWNSTREAM(FEET) =   1506.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =   569.03   CHANNEL SLOPE =  0.1169
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.228
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.21      0.50     0.886     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.886
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.37
  AVERAGE FLOW DEPTH(FEET) =   1.71   TRAVEL TIME(MIN.) =   1.29
  Tc(MIN.) =   16.20
  SUBAREA AREA(ACRES) =    43.21       SUBAREA RUNOFF(CFS) =   30.53
  EFFECTIVE AREA(ACRES) =    113.78     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      113.8         PEAK FLOW RATE(CFS) =      76.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =   7.67
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12265.00 =    3469.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12265.00 TO NODE  12266.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   1506.41  DOWNSTREAM(FEET) =   1311.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2121.93   CHANNEL SLOPE =  0.0920
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.064
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.55      0.50     0.710     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.710
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     103.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.60
  AVERAGE FLOW DEPTH(FEET) =   2.13   TRAVEL TIME(MIN.) =   4.65
  Tc(MIN.) =   20.86
  SUBAREA AREA(ACRES) =    84.55       SUBAREA RUNOFF(CFS) =   53.93
  EFFECTIVE AREA(ACRES) =    198.33     AREA-AVERAGED Fm(INCH/HR) =   0.43
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.85
  TOTAL AREA(ACRES) =      198.3         PEAK FLOW RATE(CFS) =     113.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.21   FLOW VELOCITY(FEET/SEC.) =   7.77
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12266.00 =    5591.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12266.00 TO NODE  12267.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1311.17  DOWNSTREAM(FEET) =   1232.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1555.18   CHANNEL SLOPE =  0.0506
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.960
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      160.37      0.50     0.633     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.633
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     160.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.76
  AVERAGE FLOW DEPTH(FEET) =   2.81   TRAVEL TIME(MIN.) =   3.84
  Tc(MIN.) =   24.69
  SUBAREA AREA(ACRES) =   160.37       SUBAREA RUNOFF(CFS) =   92.90
  EFFECTIVE AREA(ACRES) =    358.70     AREA-AVERAGED Fm(INCH/HR) =   0.38
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.75
  TOTAL AREA(ACRES) =      358.7         PEAK FLOW RATE(CFS) =     188.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.99   FLOW VELOCITY(FEET/SEC.) =   7.03
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12267.00 =    7146.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12267.00 TO NODE  12268.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1232.47  DOWNSTREAM(FEET) =   1141.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2111.19   CHANNEL SLOPE =  0.0430
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.862
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      100.65      0.50     0.970     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.970
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     205.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.75
  AVERAGE FLOW DEPTH(FEET) =   3.18   TRAVEL TIME(MIN.) =   5.21
  Tc(MIN.) =   29.91
  SUBAREA AREA(ACRES) =   100.65       SUBAREA RUNOFF(CFS) =   34.11
  EFFECTIVE AREA(ACRES) =    459.35     AREA-AVERAGED Fm(INCH/HR) =   0.40
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      459.4          PEAK FLOW RATE(CFS) =     190.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.09   FLOW VELOCITY(FEET/SEC.) =   6.63
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12268.00 =    9257.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12268.00 TO NODE  12269.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1141.79  DOWNSTREAM(FEET) =   1115.83
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1295.17   CHANNEL SLOPE =  0.0200
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.807
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      103.26      0.50     0.838     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.838
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     208.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.09
  AVERAGE FLOW DEPTH(FEET) =   3.70   TRAVEL TIME(MIN.) =   4.24
  Tc(MIN.) =   34.15
  SUBAREA AREA(ACRES) =   103.26       SUBAREA RUNOFF(CFS) =   36.00
  EFFECTIVE AREA(ACRES) =    562.61     AREA-AVERAGED Fm(INCH/HR) =   0.40
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      562.6          PEAK FLOW RATE(CFS) =     203.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.66   FLOW VELOCITY(FEET/SEC.) =   5.07
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.00 =   10552.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.00 TO NODE  12269.50 IS CODE =  51
```



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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1115.83  DOWNSTREAM(FEET) =   1100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1137.63   CHANNEL SLOPE =  0.0139
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.752
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.20      0.50     0.708     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.708
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     212.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.46
  AVERAGE FLOW DEPTH(FEET) =   3.99   TRAVEL TIME(MIN.) =   4.25
  Tc(MIN.) =   38.39
  SUBAREA AREA(ACRES) =    50.20       SUBAREA RUNOFF(CFS) =   17.96
  EFFECTIVE AREA(ACRES) =    612.81     AREA-AVERAGED Fm(INCH/HR) =   0.40
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      612.8          PEAK FLOW RATE(CFS) =     203.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.92   FLOW VELOCITY(FEET/SEC.) =   4.42
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.50 =   11690.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.50 TO NODE  12270.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1091.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1219.38   CHANNEL SLOPE =  0.0073
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.697
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.30      0.50     0.583     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.583
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     221.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.55
  AVERAGE FLOW DEPTH(FEET) =   4.57   TRAVEL TIME(MIN.) =   5.73
  Tc(MIN.) =   44.13
  SUBAREA AREA(ACRES) =    98.30       SUBAREA RUNOFF(CFS) =   35.88
  EFFECTIVE AREA(ACRES) =    711.11     AREA-AVERAGED Fm(INCH/HR) =   0.39
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      711.1          PEAK FLOW RATE(CFS) =     203.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.42   FLOW VELOCITY(FEET/SEC.) =   3.48
```

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 LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12270.00 =   12909.80 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12270.00 TO NODE  12271.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1091.06  DOWNSTREAM(FEET) =    962.23
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1995.19   CHANNEL SLOPE =  0.0646
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.663
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      181.93      0.50     0.746     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.746
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     227.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.08
 AVERAGE FLOW DEPTH(FEET) =   3.06   TRAVEL TIME(MIN.) =   4.12
 Tc(MIN.) =   48.24
 SUBAREA AREA(ACRES) =   181.93       SUBAREA RUNOFF(CFS) =   47.53
 EFFECTIVE AREA(ACRES) =    893.04     AREA-AVERAGED Fm(INCH/HR) =   0.38
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.76
 TOTAL AREA(ACRES) =      893.0         PEAK FLOW RATE(CFS) =     225.67

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.05   FLOW VELOCITY(FEET/SEC.) =   8.06
 LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12271.00 =   14904.99 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12271.00 TO NODE  12272.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    962.23  DOWNSTREAM(FEET) =    917.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1613.85   CHANNEL SLOPE =  0.0278
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.632
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      181.79      0.50     0.910     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     240.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.96
 AVERAGE FLOW DEPTH(FEET) =   3.66   TRAVEL TIME(MIN.) =   4.51
 Tc(MIN.) =   52.76
 SUBAREA AREA(ACRES) =   181.79       SUBAREA RUNOFF(CFS) =   28.87
 EFFECTIVE AREA(ACRES) =   1074.83     AREA-AVERAGED Fm(INCH/HR) =   0.39
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.79
 TOTAL AREA(ACRES) =     1074.8         PEAK FLOW RATE(CFS) =     229.00
```



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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.60   FLOW VELOCITY(FEET/SEC.) =   5.90
 LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12272.00 =   16518.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    917.38  DOWNSTREAM(FEET) =    846.91
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3182.34   CHANNEL SLOPE =  0.0221
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.577
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       79.99      0.50     0.948     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.948
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     232.72
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.43
 AVERAGE FLOW DEPTH(FEET) =   3.78   TRAVEL TIME(MIN.) =   9.77
 Tc(MIN.) =   62.52
 SUBAREA AREA(ACRES) =    79.99       SUBAREA RUNOFF(CFS) =    7.42
 EFFECTIVE AREA(ACRES) =   1154.82     AREA-AVERAGED Fm(INCH/HR) =   0.40
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.80
 TOTAL AREA(ACRES) =     1154.8         PEAK FLOW RATE(CFS) =     229.00
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.76   FLOW VELOCITY(FEET/SEC.) =   5.41
 LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12281.00 =   19701.18 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   62.52
 RAINFALL INTENSITY(INCH/HR) =   0.58
 AREA-AVERAGED Fm(INCH/HR) =  0.40
 AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  0.80
 EFFECTIVE STREAM AREA(ACRES) =    1154.82
 TOTAL STREAM AREA(ACRES) =    1154.82
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     229.00

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1173.66   38.14    0.755  0.50( 0.50) 1.00    3253.8   12211.00
     1     1131.75   45.25    0.688  0.50( 0.50) 1.00    3798.7   12201.00
     1     1065.44   51.83    0.637  0.50( 0.50) 1.00    4199.1   12111.00
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     1     1011.81   56.07    0.611  0.50( 0.50) 1.00    4477.0   12231.00
     1      909.64   63.33    0.574  0.50( 0.50) 1.00    4883.9   12101.10
     1      685.00   82.99    0.506  0.50( 0.50) 1.00    5880.7   12010.00
     1      499.21   94.64    0.473  0.50( 0.50) 1.00    6008.3   12000.00
     2      229.00   62.52    0.577  0.50( 0.40) 0.80    1154.8   12261.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1402.66   38.14    0.755  0.50( 0.48) 0.96    3958.3   12211.00
      2     1360.75   45.25    0.688  0.50( 0.48) 0.96    4634.4   12201.00
      3     1294.45   51.83    0.637  0.50( 0.48) 0.96    5156.5   12111.00
      4     1240.81   56.07    0.611  0.50( 0.48) 0.96    5512.6   12231.00
      5     1150.04   62.52    0.577  0.50( 0.48) 0.96    5993.4   12261.00
      6     1135.01   63.33    0.574  0.50( 0.48) 0.96    6038.7   12101.10
      7      822.15   82.99    0.506  0.50( 0.48) 0.97    7035.5   12010.00
      8      621.31   94.64    0.473  0.50( 0.48) 0.97    7163.1   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1402.66    Tc(MIN.) =    38.14
  EFFECTIVE AREA(ACRES) =    3958.32   AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     7163.1
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12281.00 =   40657.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12281.00 TO NODE  12282.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    846.91  DOWNSTREAM(FEET) =    835.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1561.00   CHANNEL SLOPE =  0.0072
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.708
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      267.56      0.50     0.867     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1435.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.64
  AVERAGE FLOW DEPTH(FEET) =   9.21   TRAVEL TIME(MIN.) =   4.61
  Tc(MIN.) =   42.76
  SUBAREA AREA(ACRES) =   267.56       SUBAREA RUNOFF(CFS) =   66.15
  EFFECTIVE AREA(ACRES) =   4225.88     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     7430.6         PEAK FLOW RATE(CFS) =    1402.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.14   FLOW VELOCITY(FEET/SEC.) =   5.60
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12282.00 =   42218.56 FEET.
```



```
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     7430.6  TC(MIN.) =     42.76
  EFFECTIVE AREA(ACRES) =   4225.88  AREA-AVERAGED Fm(INCH/HR)=  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.958
  PEAK FLOW RATE(CFS)   =    1402.66

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1402.66   42.76    0.708  0.50( 0.48) 0.96    4225.9   12211.00
      2     1360.75   49.90    0.650  0.50( 0.48) 0.96    4902.0   12201.00
      3     1294.45   56.55    0.608  0.50( 0.48) 0.96    5424.0   12111.00
      4     1240.81   60.84    0.583  0.50( 0.48) 0.96    5780.2   12231.00
      5     1150.04   67.38    0.560  0.50( 0.48) 0.96    6260.9   12261.00
      6     1135.01   68.21    0.558  0.50( 0.48) 0.96    6306.3   12101.10
      7      822.15   88.28    0.488  0.50( 0.48) 0.96    7303.0   12010.00
      8      621.31  100.32    0.461  0.50( 0.48) 0.96    7430.6   12000.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:
```

```
  FILE NAME: S23.DAT
  TIME/DATE OF STUDY: 14:04 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.503
   2)   10.00;  1.686
   3)   15.00;  1.273
   4)   20.00;  1.087
   5)   25.00;  0.952
   6)   30.00;  0.860
   7)   40.00;  0.731
   8)   50.00;  0.649
   9)   60.00;  0.586
  10)   90.00;  0.482
  11)  120.00;  0.421
  12)  180.00;  0.350
  13)  360.00;  0.253
  14) 1440.00;  0.110
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12300.00 TO NODE  12301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   924.36
  ELEVATION DATA: UPSTREAM(FEET) =   1712.53  DOWNSTREAM(FEET) =   1490.12

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.417
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.321
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.50     1.000     0   14.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.92
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =      4.92

**************************************************************************
  FLOW PROCESS FROM NODE  12301.00 TO NODE  12302.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1490.12  DOWNSTREAM(FEET) =   1117.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1564.45   CHANNEL SLOPE =  0.2380
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.153
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.97      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.85
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   18.22
  SUBAREA AREA(ACRES) =    39.97       SUBAREA RUNOFF(CFS) =   23.49
  EFFECTIVE AREA(ACRES) =     46.63     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       46.6         PEAK FLOW RATE(CFS) =      27.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.09   FLOW VELOCITY(FEET/SEC.) =   7.74
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12302.00 =    2488.81 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1117.78  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2216.41   CHANNEL SLOPE =  0.1520
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.996
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.51      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.17
  AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   5.15
  Tc(MIN.) =   23.37
  SUBAREA AREA(ACRES) =    51.51       SUBAREA RUNOFF(CFS) =   22.98
  EFFECTIVE AREA(ACRES) =     98.14     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       98.1         PEAK FLOW RATE(CFS) =      43.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =   7.38
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S22.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1402.66   42.76  0.50( 0.48) 0.96    4225.9   12211.00
      2     1360.75   49.90  0.50( 0.48) 0.96    4902.0   12201.00
      3     1294.45   56.55  0.50( 0.48) 0.96    5424.0   12111.00
      4     1240.81   60.84  0.50( 0.48) 0.96    5780.2   12231.00
      5     1150.04   67.38  0.50( 0.48) 0.96    6260.9   12261.00
      6     1135.01   68.21  0.50( 0.48) 0.96    6306.3   12101.10
      7      822.15   88.28  0.50( 0.48) 0.96    7303.0   12010.00
      8      621.31  100.32  0.50( 0.48) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
```



```
      1     1402.66   42.76  0.50( 0.48) 0.96    4225.9   12211.00
      2     1360.75   49.90  0.50( 0.48) 0.96    4902.0   12201.00
      3     1294.45   56.55  0.50( 0.48) 0.96    5424.0   12111.00
      4     1240.81   60.84  0.50( 0.48) 0.96    5780.2   12231.00
      5     1150.04   67.38  0.50( 0.48) 0.96    6260.9   12261.00
      6     1135.01   68.21  0.50( 0.48) 0.96    6306.3   12101.10
      7      822.15   88.28  0.50( 0.48) 0.96    7303.0   12010.00
      8      621.31  100.32  0.50( 0.48) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12320.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    835.60  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1568.10   CHANNEL SLOPE =  0.0349
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.687
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.15      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1406.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.12
  AVERAGE FLOW DEPTH(FEET) =   6.81   TRAVEL TIME(MIN.) =   2.58
  Tc(MIN.) =   45.34
  SUBAREA AREA(ACRES) =    51.15       SUBAREA RUNOFF(CFS) =    8.61
  EFFECTIVE AREA(ACRES) =   4277.03     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     7481.8         PEAK FLOW RATE(CFS) =    1402.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.80   FLOW VELOCITY(FEET/SEC.) =  10.11
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1402.66   45.34    0.687  0.50( 0.48) 0.96    4277.0   12211.00
      2     1360.75   52.51    0.633  0.50( 0.48) 0.96    4953.1   12201.00
      3     1294.45   59.19    0.591  0.50( 0.48) 0.96    5475.2   12111.00
      4     1240.81   63.50    0.574  0.50( 0.48) 0.96    5831.4   12231.00
      5     1150.04   70.10    0.551  0.50( 0.48) 0.96    6312.1   12261.00
      6     1135.01   70.94    0.548  0.50( 0.48) 0.96    6357.4   12101.10
      7      822.15   91.23    0.479  0.50( 0.48) 0.96    7354.2   12010.00
      8      621.31  103.48    0.455  0.50( 0.48) 0.96    7481.8   12000.00
```

```
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       43.79   23.37    0.996  0.50( 0.50) 1.00      98.1   12300.00
 LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1446.45   23.37    0.996  0.50( 0.48) 0.96    2302.9   12300.00
     2     1419.18   45.34    0.687  0.50( 0.48) 0.96    4375.2   12211.00
     3     1372.50   52.51    0.633  0.50( 0.48) 0.96    5051.3   12201.00
     4     1302.48   59.19    0.591  0.50( 0.48) 0.96    5573.3   12111.00
     5     1247.32   63.50    0.574  0.50( 0.48) 0.96    5929.5   12231.00
     6     1154.52   70.10    0.551  0.50( 0.48) 0.96    6410.2   12261.00
     7     1139.24   70.94    0.548  0.50( 0.48) 0.96    6455.6   12101.10
     8      822.15   91.23    0.479  0.50( 0.48) 0.96    7452.3   12010.00
     9      621.31  103.48    0.455  0.50( 0.48) 0.96    7579.9   12000.00
   TOTAL AREA(ACRES) =      7579.9

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1446.45  Tc(MIN.) =   23.373
 EFFECTIVE AREA(ACRES) =   2302.90  AREA-AVERAGED Fm(INCH/HR) =  0.48
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     7579.9
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12320.00 TO NODE  12321.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    780.80  DOWNSTREAM(FEET) =    761.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2102.41   CHANNEL SLOPE =  0.0091
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.878
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      180.82      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1477.20
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.18
 AVERAGE FLOW DEPTH(FEET) =   8.92   TRAVEL TIME(MIN.) =   5.67
 Tc(MIN.) =   29.04
 SUBAREA AREA(ACRES) =   180.82       SUBAREA RUNOFF(CFS) =   61.43
 EFFECTIVE AREA(ACRES) =   2483.72     AREA-AVERAGED Fm(INCH/HR) =   0.48
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     7760.8         PEAK FLOW RATE(CFS) =    1446.45
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.85   FLOW VELOCITY(FEET/SEC.) =   6.15
```



```
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12321.00 =   45889.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12321.00 TO NODE  12322.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    761.66  DOWNSTREAM(FEET) =    710.30
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.13   CHANNEL SLOPE =  0.0268
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.828
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      217.17      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1478.50
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.27
 AVERAGE FLOW DEPTH(FEET) =   7.29   TRAVEL TIME(MIN.) =   3.44
 Tc(MIN.) =   32.48
 SUBAREA AREA(ACRES) =   217.17       SUBAREA RUNOFF(CFS) =   64.06
 EFFECTIVE AREA(ACRES) =   2700.89     AREA-AVERAGED Fm(INCH/HR) =   0.48
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     7977.9         PEAK FLOW RATE(CFS) =    1446.45
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.23   FLOW VELOCITY(FEET/SEC.) =   9.22
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12322.00 =   47805.20 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    710.30  DOWNSTREAM(FEET) =    678.19
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1977.07   CHANNEL SLOPE =  0.0162
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.773
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      194.67      0.50     0.999     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1470.38
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.68
 AVERAGE FLOW DEPTH(FEET) =   7.99   TRAVEL TIME(MIN.) =   4.29
 Tc(MIN.) =   36.78
 SUBAREA AREA(ACRES) =   194.67       SUBAREA RUNOFF(CFS) =   47.81
 EFFECTIVE AREA(ACRES) =   2895.56     AREA-AVERAGED Fm(INCH/HR) =   0.48
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     8172.6         PEAK FLOW RATE(CFS) =    1446.45
```

```
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.95   FLOW VELOCITY(FEET/SEC.) =   7.64
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   36.78
  RAINFALL INTENSITY(INCH/HR) =   0.77
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =    2895.56
  TOTAL STREAM AREA(ACRES) =    8172.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1446.45

****************************************************************************
  FLOW PROCESS FROM NODE  12330.00 TO NODE  12331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   994.42
  ELEVATION DATA: UPSTREAM(FEET) =   1754.00  DOWNSTREAM(FEET) =   1530.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.046
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.271
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        3.33      0.50     1.000     0   15.05
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.31
  TOTAL AREA(ACRES) =      3.33   PEAK FLOW RATE(CFS) =      2.31

****************************************************************************
  FLOW PROCESS FROM NODE  12331.00 TO NODE  12332.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1530.30  DOWNSTREAM(FEET) =   1412.81
  CHANNEL LENGTH THRU SUBAREA(FEET) =   946.66   CHANNEL SLOPE =  0.1241
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.149
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       28.08      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.78
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   18.34
  SUBAREA AREA(ACRES) =    28.08       SUBAREA RUNOFF(CFS) =   16.39
  EFFECTIVE AREA(ACRES) =     31.41     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.4          PEAK FLOW RATE(CFS) =      18.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   5.48
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12332.00 =    1941.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12332.00 TO NODE  12333.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1412.81  DOWNSTREAM(FEET) =   1235.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.37   CHANNEL SLOPE =  0.0907
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.969
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       44.96      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.43
  AVERAGE FLOW DEPTH(FEET) =   1.31   TRAVEL TIME(MIN.) =   6.02
  Tc(MIN.) =   24.36
  SUBAREA AREA(ACRES) =    44.96       SUBAREA RUNOFF(CFS) =   18.98
  EFFECTIVE AREA(ACRES) =     76.37     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.4          PEAK FLOW RATE(CFS) =      32.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   5.61
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12333.00 =    3900.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12333.00 TO NODE  12334.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1235.19  DOWNSTREAM(FEET) =   1013.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1921.81   CHANNEL SLOPE =  0.1151
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.871
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.50      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.36
  AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   5.04
  Tc(MIN.) =   29.40
  SUBAREA AREA(ACRES) =    30.50       SUBAREA RUNOFF(CFS) =   10.18
  EFFECTIVE AREA(ACRES) =    106.87     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.9         PEAK FLOW RATE(CFS) =      35.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.37   FLOW VELOCITY(FEET/SEC.) =   6.33
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12334.00 =    5822.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12334.00 TO NODE  12335.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1013.96  DOWNSTREAM(FEET) =    809.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2029.80   CHANNEL SLOPE =  0.1006
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.803
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.82      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.72
  AVERAGE FLOW DEPTH(FEET) =   1.66   TRAVEL TIME(MIN.) =   5.03
  Tc(MIN.) =   34.43
  SUBAREA AREA(ACRES) =   145.82       SUBAREA RUNOFF(CFS) =   39.72
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =      68.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.80   FLOW VELOCITY(FEET/SEC.) =   7.06
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12335.00 =    7852.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    809.84  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.44   CHANNEL SLOPE =  0.0691
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
```



```
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.737
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.71      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.26
  AVERAGE FLOW DEPTH(FEET) =   1.99   TRAVEL TIME(MIN.) =   5.07
  Tc(MIN.) =   39.50
  SUBAREA AREA(ACRES) =    50.71       SUBAREA RUNOFF(CFS) =   10.83
  EFFECTIVE AREA(ACRES) =    303.40     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.4         PEAK FLOW RATE(CFS) =      68.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   6.14
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12340.00 =    9757.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   39.50
  RAINFALL INTENSITY(INCH/HR) =   0.74
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     303.40
  TOTAL STREAM AREA(ACRES) =     303.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      68.84

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1446.45   36.78    0.773  0.50( 0.48) 0.97    2895.6   12300.00
      1     1419.18   58.85    0.593  0.50( 0.48) 0.96    4967.8   12211.00
      1     1372.50   66.14    0.565  0.50( 0.48) 0.96    5643.9   12201.00
      1     1302.48   73.00    0.541  0.50( 0.48) 0.96    6166.0   12111.00
      1     1247.32   77.47    0.525  0.50( 0.48) 0.96    6522.2   12231.00
      1     1154.52   84.35    0.502  0.50( 0.48) 0.96    7002.9   12261.00
      1     1139.24   85.22    0.499  0.50( 0.48) 0.96    7048.2   12101.10
      1      822.15  106.74    0.448  0.50( 0.48) 0.97    8045.0   12010.00
      1      621.31  120.13    0.421  0.50( 0.48) 0.97    8172.6   12000.00
      2       68.84   39.50    0.737  0.50( 0.50) 1.00     303.4   12330.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
      1     1515.28   36.78    0.773  0.50( 0.49) 0.97    3178.0   12300.00
      2     1511.92   39.50    0.737  0.50( 0.49) 0.97    3454.7   12330.00
      3     1446.18   58.85    0.593  0.50( 0.48) 0.97    5271.2   12211.00
      4     1391.21   66.14    0.565  0.50( 0.48) 0.97    5947.3   12201.00
      5     1314.30   73.00    0.541  0.50( 0.48) 0.96    6469.4   12111.00
      6     1254.63   77.47    0.525  0.50( 0.48) 0.96    6825.6   12231.00
      7     1154.93   84.35    0.502  0.50( 0.48) 0.96    7306.3   12261.00
      8     1139.24   85.22    0.499  0.50( 0.48) 0.96    7351.6   12101.10
      9      822.15  106.74    0.448  0.50( 0.48) 0.97    8348.4   12010.00
     10      621.31  120.13    0.421  0.50( 0.48) 0.97    8476.0   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1515.28    Tc(MIN.) =    36.78
  EFFECTIVE AREA(ACRES) =    3178.03   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =     8476.0
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12340.00 TO NODE  12341.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    678.19  DOWNSTREAM(FEET) =    630.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2827.23   CHANNEL SLOPE =  0.0170
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.709
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      317.33      0.50     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1545.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.90
  AVERAGE FLOW DEPTH(FEET) =   8.07   TRAVEL TIME(MIN.) =   5.97
  Tc(MIN.) =   42.74
  SUBAREA AREA(ACRES) =   317.33       SUBAREA RUNOFF(CFS) =   59.64
  EFFECTIVE AREA(ACRES) =   3495.36     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     8793.3         PEAK FLOW RATE(CFS) =    1515.28
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.02   FLOW VELOCITY(FEET/SEC.) =   7.86
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12341.00 =   52609.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12341.00 TO NODE  12342.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    630.21  DOWNSTREAM(FEET) =    601.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2006.47   CHANNEL SLOPE =  0.0142
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```



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  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.671
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.13      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1524.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.37
  AVERAGE FLOW DEPTH(FEET) =   8.31   TRAVEL TIME(MIN.) =   4.54
  Tc(MIN.) =   47.28
  SUBAREA AREA(ACRES) =   124.13       SUBAREA RUNOFF(CFS) =   19.11
  EFFECTIVE AREA(ACRES) =   3619.49     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     8917.5         PEAK FLOW RATE(CFS) =    1515.28
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.28   FLOW VELOCITY(FEET/SEC.) =   7.36
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12342.00 =   54615.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    601.66  DOWNSTREAM(FEET) =    572.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.49   CHANNEL SLOPE =  0.0156
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.640
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.92      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1521.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.62
  AVERAGE FLOW DEPTH(FEET) =   8.16   TRAVEL TIME(MIN.) =   4.12
  Tc(MIN.) =   51.40
  SUBAREA AREA(ACRES) =    96.92       SUBAREA RUNOFF(CFS) =   12.21
  EFFECTIVE AREA(ACRES) =   3716.41     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =     9014.4         PEAK FLOW RATE(CFS) =    1515.28
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.15   FLOW VELOCITY(FEET/SEC.) =   7.61
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     9014.4  TC(MIN.) =     51.40
  EFFECTIVE AREA(ACRES) =   3716.41  AREA-AVERAGED Fm(INCH/HR)=  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.975
  PEAK FLOW RATE(CFS)   =    1515.28
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1515.28	51.40	0.640	0.50(0.49)	0.98	3716.4	12300.00
2	1511.92	54.14	0.623	0.50(0.49)	0.97	3993.1	12330.00
3	1446.18	73.67	0.539	0.50(0.48)	0.97	5809.6	12211.00
4	1391.21	81.12	0.513	0.50(0.48)	0.97	6485.7	12201.00
5	1314.30	88.19	0.488	0.50(0.48)	0.97	7007.8	12111.00
6	1254.63	92.85	0.476	0.50(0.48)	0.97	7363.9	12231.00
7	1154.93	100.04	0.462	0.50(0.48)	0.97	7844.7	12261.00
8	1139.24	100.97	0.460	0.50(0.48)	0.97	7890.0	12101.10
9	822.15	123.83	0.416	0.50(0.49)	0.97	8886.8	12010.00
10	621.31	138.46	0.399	0.50(0.49)	0.97	9014.4	12000.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S24.DAT
  TIME/DATE OF STUDY: 14:04 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.503
   2)   10.00;  1.686
   3)   15.00;  1.273
   4)   20.00;  1.087
   5)   25.00;  0.952
   6)   30.00;  0.860
   7)   40.00;  0.731
   8)   50.00;  0.649
   9)   60.00;  0.586
  10)   90.00;  0.482
  11)  120.00;  0.421
  12)  180.00;  0.350
  13)  360.00;  0.253
  14) 1440.00;  0.110
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12400.00 TO NODE  12401.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   981.52
  ELEVATION DATA: UPSTREAM(FEET) =   2579.17  DOWNSTREAM(FEET) =   2249.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.811
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.371
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.82      0.50     1.000     0   13.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.91
  TOTAL AREA(ACRES) =      8.82   PEAK FLOW RATE(CFS) =      6.91

**************************************************************************
  FLOW PROCESS FROM NODE  12401.00 TO NODE  12402.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2249.14  DOWNSTREAM(FEET) =   2103.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   975.11   CHANNEL SLOPE =  0.1490
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.219
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.29      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.18
  AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =   16.44
  SUBAREA AREA(ACRES) =    46.29       SUBAREA RUNOFF(CFS) =   29.96
  EFFECTIVE AREA(ACRES) =     55.11     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.1         PEAK FLOW RATE(CFS) =      35.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   6.96
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12402.00 =    1956.63 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12402.00 TO NODE  12403.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2103.89  DOWNSTREAM(FEET) =   1771.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.50   CHANNEL SLOPE =  0.1768
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.078
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.97      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.07
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   3.88
  Tc(MIN.) =   20.33
  SUBAREA AREA(ACRES) =    54.97       SUBAREA RUNOFF(CFS) =   28.60
  EFFECTIVE AREA(ACRES) =    110.08     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =      57.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =   8.33
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12403.00 =    3837.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12403.00 TO NODE  12404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1771.34  DOWNSTREAM(FEET) =   1462.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2888.53   CHANNEL SLOPE =  0.1070
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.920
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.02      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      80.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.54
  AVERAGE FLOW DEPTH(FEET) =   1.89   TRAVEL TIME(MIN.) =   6.39
  Tc(MIN.) =   26.71
  SUBAREA AREA(ACRES) =   123.02       SUBAREA RUNOFF(CFS) =   46.53
  EFFECTIVE AREA(ACRES) =    233.10     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      233.1         PEAK FLOW RATE(CFS) =      88.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =   7.68
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12404.00 =    6725.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12404.00 TO NODE  12405.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1462.30  DOWNSTREAM(FEET) =   1308.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.25   CHANNEL SLOPE =  0.0800
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.847
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      241.71      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     126.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.54
  AVERAGE FLOW DEPTH(FEET) =   2.36   TRAVEL TIME(MIN.) =   4.26
  Tc(MIN.) =   30.97
  SUBAREA AREA(ACRES) =   241.71       SUBAREA RUNOFF(CFS) =   75.55
  EFFECTIVE AREA(ACRES) =    474.81     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      474.8         PEAK FLOW RATE(CFS) =     148.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.51   FLOW VELOCITY(FEET/SEC.) =   7.87
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12405.00 =    8650.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12405.00 TO NODE  12406.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.28  DOWNSTREAM(FEET) =   1154.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1923.41   CHANNEL SLOPE =  0.0802
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.797
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.96      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     180.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.26
  AVERAGE FLOW DEPTH(FEET) =   2.70   TRAVEL TIME(MIN.) =   3.88
  Tc(MIN.) =   34.85
  SUBAREA AREA(ACRES) =   238.96       SUBAREA RUNOFF(CFS) =   63.92
  EFFECTIVE AREA(ACRES) =    713.77     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      713.8         PEAK FLOW RATE(CFS) =     190.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.76   FLOW VELOCITY(FEET/SEC.) =   8.37
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12406.00 =   10574.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =  51
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1154.02  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1607.69   CHANNEL SLOPE =  0.0503
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.749
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.02      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     197.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.09
  AVERAGE FLOW DEPTH(FEET) =   3.05   TRAVEL TIME(MIN.) =   3.78
  Tc(MIN.) =   38.63
  SUBAREA AREA(ACRES) =    58.02       SUBAREA RUNOFF(CFS) =   12.97
  EFFECTIVE AREA(ACRES) =    771.79     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      771.8         PEAK FLOW RATE(CFS) =     190.94
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.01   FLOW VELOCITY(FEET/SEC.) =   7.03
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   38.63
  RAINFALL INTENSITY(INCH/HR) =   0.75
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     771.79
  TOTAL STREAM AREA(ACRES) =     771.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     190.94

****************************************************************************
  FLOW PROCESS FROM NODE  12410.00 TO NODE  12411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   966.15
  ELEVATION DATA: UPSTREAM(FEET) =   2215.42  DOWNSTREAM(FEET) =   1909.05

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.886
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.365
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.99      0.50     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.00
  TOTAL AREA(ACRES) =      8.99   PEAK FLOW RATE(CFS) =      7.00

****************************************************************************
  FLOW PROCESS FROM NODE  12411.00 TO NODE  12412.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1909.05  DOWNSTREAM(FEET) =   1794.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.59   CHANNEL SLOPE =  0.1215
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.197
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.56      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.99
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   3.15
  Tc(MIN.) =   17.04
  SUBAREA AREA(ACRES) =    18.56       SUBAREA RUNOFF(CFS) =   11.64
  EFFECTIVE AREA(ACRES) =     27.55     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.5         PEAK FLOW RATE(CFS) =      17.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   5.38
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12412.00 =    1909.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12412.00 TO NODE  12413.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.38  DOWNSTREAM(FEET) =   1649.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.82   CHANNEL SLOPE =  0.1560
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.106
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.09      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.27
```

```
  AVERAGE FLOW DEPTH(FEET) =   1.07   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   19.50
  SUBAREA AREA(ACRES) =    16.09       SUBAREA RUNOFF(CFS) =    8.77
  EFFECTIVE AREA(ACRES) =     43.64     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       43.6          PEAK FLOW RATE(CFS) =      23.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.11   FLOW VELOCITY(FEET/SEC.) =   6.42
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12413.00 =    2836.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12413.00 TO NODE  12414.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1649.76  DOWNSTREAM(FEET) =   1365.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1906.16   CHANNEL SLOPE =  0.1490
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.980
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.14      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.14
  AVERAGE FLOW DEPTH(FEET) =   1.37   TRAVEL TIME(MIN.) =   4.45
  Tc(MIN.) =   23.95
  SUBAREA AREA(ACRES) =    75.14       SUBAREA RUNOFF(CFS) =   32.48
  EFFECTIVE AREA(ACRES) =    118.78     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.8          PEAK FLOW RATE(CFS) =      51.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =   7.62
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12414.00 =    4742.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1365.78  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3038.90   CHANNEL SLOPE =  0.0963
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.846
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.43      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      75.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.13
  AVERAGE FLOW DEPTH(FEET) =   1.87   TRAVEL TIME(MIN.) =   7.11
  Tc(MIN.) =   31.05
  SUBAREA AREA(ACRES) =   151.43       SUBAREA RUNOFF(CFS) =   47.18
  EFFECTIVE AREA(ACRES) =    270.21     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      270.2          PEAK FLOW RATE(CFS) =      84.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =   7.32
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12420.00 =    7781.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.05
  RAINFALL INTENSITY(INCH/HR) =   0.85
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     270.21
  TOTAL STREAM AREA(ACRES) =     270.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      84.19

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      190.94   38.63    0.749  0.50( 0.50) 1.00     771.8   12400.00
      2       84.19   31.05    0.846  0.50( 0.50) 1.00     270.2   12410.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      275.14   31.05    0.846  0.50( 0.50) 1.00     890.6   12410.00
      2      251.37   38.63    0.749  0.50( 0.50) 1.00    1042.0   12400.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     275.14    Tc(MIN.) =    31.05
  EFFECTIVE AREA(ACRES) =     890.62   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1042.0
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12420.00 TO NODE  12421.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1073.11  DOWNSTREAM(FEET) =   1005.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2235.12   CHANNEL SLOPE =  0.0303
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.773
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      218.57      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     301.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.53
  AVERAGE FLOW DEPTH(FEET) =   3.93   TRAVEL TIME(MIN.) =   5.70
  Tc(MIN.) =   36.76
  SUBAREA AREA(ACRES) =   218.57       SUBAREA RUNOFF(CFS) =   53.63
  EFFECTIVE AREA(ACRES) =   1109.19     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1260.6         PEAK FLOW RATE(CFS) =     275.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.79   FLOW VELOCITY(FEET/SEC.) =   6.39
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12421.00 =   14417.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12421.00 TO NODE  12422.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.32  DOWNSTREAM(FEET) =    879.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.31   CHANNEL SLOPE =  0.0451
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.707
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      241.55      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     297.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.54
  AVERAGE FLOW DEPTH(FEET) =   3.63   TRAVEL TIME(MIN.) =   6.19
  Tc(MIN.) =   42.95
  SUBAREA AREA(ACRES) =   241.55       SUBAREA RUNOFF(CFS) =   44.92
  EFFECTIVE AREA(ACRES) =   1350.74     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1502.1         PEAK FLOW RATE(CFS) =     275.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.52   FLOW VELOCITY(FEET/SEC.) =   7.40
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12422.00 =   17217.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12422.00 TO NODE  12423.00 IS CODE =  51
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    879.13  DOWNSTREAM(FEET) =    815.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.90   CHANNEL SLOPE =  0.0333
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.668
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.63      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     286.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.68
  AVERAGE FLOW DEPTH(FEET) =   3.78   TRAVEL TIME(MIN.) =   4.79
  Tc(MIN.) =   47.73
  SUBAREA AREA(ACRES) =   151.63       SUBAREA RUNOFF(CFS) =   22.84
  EFFECTIVE AREA(ACRES) =   1502.37     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1653.8         PEAK FLOW RATE(CFS) =     275.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.73   FLOW VELOCITY(FEET/SEC.) =   6.61
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12423.00 =   19136.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12423.00 TO NODE  12424.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    815.17  DOWNSTREAM(FEET) =    696.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2870.82   CHANNEL SLOPE =  0.0413
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.621
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      122.40      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     281.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.20
  AVERAGE FLOW DEPTH(FEET) =   3.61   TRAVEL TIME(MIN.) =   6.64
  Tc(MIN.) =   54.38
  SUBAREA AREA(ACRES) =   122.40       SUBAREA RUNOFF(CFS) =   13.35
  EFFECTIVE AREA(ACRES) =   1624.77     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1776.2         PEAK FLOW RATE(CFS) =     275.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.58   FLOW VELOCITY(FEET/SEC.) =   7.17
```

```
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12424.00 =   22007.16 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    696.54  DOWNSTREAM(FEET) =    572.29
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3680.45   CHANNEL SLOPE =  0.0338
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.574
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       96.54      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     278.33
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.66
 AVERAGE FLOW DEPTH(FEET) =   3.73   TRAVEL TIME(MIN.) =   9.22
 Tc(MIN.) =   63.59
 SUBAREA AREA(ACRES) =    96.54       SUBAREA RUNOFF(CFS) =    6.37
 EFFECTIVE AREA(ACRES) =   1721.31     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1872.7         PEAK FLOW RATE(CFS) =     275.14
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.72   FLOW VELOCITY(FEET/SEC.) =   6.63
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12425.00 =   25687.61 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1872.7  TC(MIN.) =     63.59
 EFFECTIVE AREA(ACRES) =   1721.31  AREA-AVERAGED Fm(INCH/HR)=  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =     275.14

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      275.14   63.59    0.574  0.50( 0.50) 1.00    1721.3   12410.00
     2      251.37   72.00    0.544  0.50( 0.50) 1.00    1872.7   12400.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S25.DAT
  TIME/DATE OF STUDY: 14:04 04/03/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.757
   2)   10.00;  1.825
   3)   15.00;  1.329
   4)   20.00;  1.138
   5)   25.00;  0.991
   6)   30.00;  0.887
   7)   40.00;  0.761
   8)   50.00;  0.678
   9)   60.00;  0.618
  10)   90.00;  0.515
  11)  120.00;  0.458
  12)  180.00;  0.385
  13)  360.00;  0.287
  14) 1440.00;  0.126
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  12500.00 TO NODE  12501.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   927.04
  ELEVATION DATA: UPSTREAM(FEET) =   1638.22  DOWNSTREAM(FEET) =   1356.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.770
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.451
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        8.89      0.50     1.000     0   13.77
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.61
  TOTAL AREA(ACRES) =      8.89   PEAK FLOW RATE(CFS) =      7.61

************************************************************************
  FLOW PROCESS FROM NODE  12501.00 TO NODE  12502.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1356.00  DOWNSTREAM(FEET) =   1203.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1004.73   CHANNEL SLOPE =  0.1519
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.265
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       24.30      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.74
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   2.92
  Tc(MIN.) =   16.69
  SUBAREA AREA(ACRES) =    24.30       SUBAREA RUNOFF(CFS) =   16.72
  EFFECTIVE AREA(ACRES) =     33.19     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.2         PEAK FLOW RATE(CFS) =      22.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   6.28
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12502.00 =    1931.77 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  12502.00 TO NODE  12503.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1203.37  DOWNSTREAM(FEET) =    987.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.62   CHANNEL SLOPE =  0.1147
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.099
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.42      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.76
  AVERAGE FLOW DEPTH(FEET) =   1.53   TRAVEL TIME(MIN.) =   4.65
  Tc(MIN.) =   21.34
  SUBAREA AREA(ACRES) =    90.42       SUBAREA RUNOFF(CFS) =   48.74
  EFFECTIVE AREA(ACRES) =    123.61     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      123.6         PEAK FLOW RATE(CFS) =      66.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.74   FLOW VELOCITY(FEET/SEC.) =   7.36
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12503.00 =    3816.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12503.00 TO NODE  12504.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    987.23  DOWNSTREAM(FEET) =    870.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1478.57   CHANNEL SLOPE =  0.0792
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.993
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.07      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      85.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.82
  AVERAGE FLOW DEPTH(FEET) =   2.04   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =   24.95
  SUBAREA AREA(ACRES) =    84.07       SUBAREA RUNOFF(CFS) =   37.28
  EFFECTIVE AREA(ACRES) =    207.68     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.7         PEAK FLOW RATE(CFS) =      92.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.10   FLOW VELOCITY(FEET/SEC.) =   6.95
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12504.00 =    5294.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12504.00 TO NODE  12505.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.07  DOWNSTREAM(FEET) =    729.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1915.52   CHANNEL SLOPE =  0.0736
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.898
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.84      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     106.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.02
  AVERAGE FLOW DEPTH(FEET) =   2.25   TRAVEL TIME(MIN.) =   4.55
  Tc(MIN.) =   29.50
  SUBAREA AREA(ACRES) =    79.84       SUBAREA RUNOFF(CFS) =   28.57
  EFFECTIVE AREA(ACRES) =    287.52     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      287.5         PEAK FLOW RATE(CFS) =     102.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.22   FLOW VELOCITY(FEET/SEC.) =   6.94
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12505.00 =    7210.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    729.02  DOWNSTREAM(FEET) =    549.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2961.35   CHANNEL SLOPE =  0.0605
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.800
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.77      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     113.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.62
  AVERAGE FLOW DEPTH(FEET) =   2.39   TRAVEL TIME(MIN.) =   7.45
  Tc(MIN.) =   36.95
  SUBAREA AREA(ACRES) =    78.77       SUBAREA RUNOFF(CFS) =   21.23
  EFFECTIVE AREA(ACRES) =    366.29     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      366.3         PEAK FLOW RATE(CFS) =     102.89
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.30   FLOW VELOCITY(FEET/SEC.) =   6.48
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12520.00 =   10171.83 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S23.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)           (ACRES)    NODE
      1     1515.28   51.40  0.50( 0.49) 0.98    3716.4   12300.00
      2     1511.92   54.14  0.50( 0.49) 0.97    3993.1   12330.00
      3     1446.18   73.67  0.50( 0.48) 0.97    5809.6   12211.00
      4     1391.21   81.12  0.50( 0.48) 0.97    6485.7   12201.00
      5     1314.30   88.19  0.50( 0.48) 0.97    7007.8   12111.00
      6     1254.63   92.85  0.50( 0.48) 0.97    7363.9   12231.00
      7     1154.93  100.04  0.50( 0.48) 0.97    7844.7   12261.00
      8     1139.24  100.97  0.50( 0.48) 0.97    7890.0   12101.10
      9      822.15  123.83  0.50( 0.49) 0.97    8886.8   12010.00
     10      621.31  138.46  0.50( 0.49) 0.97    9014.4   12000.00
    TOTAL AREA(ACRES) =     9014.4

****************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S24.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)           (ACRES)    NODE
      1      275.14   63.59  0.50( 0.50) 1.00    1721.3   12410.00
      2      251.37   72.00  0.50( 0.50) 1.00    1872.7   12400.00
    TOTAL AREA(ACRES) =     1872.7

****************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1      275.14   63.59  0.50( 0.50) 1.00    1721.3   12410.00
      2      251.37   72.00  0.50( 0.50) 1.00    1872.7   12400.00
    TOTAL AREA(ACRES) =      1872.7

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```



```
  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      275.14   63.59    0.605  0.50( 0.50) 1.00    1721.3   12410.00
      2      251.37   72.00    0.577  0.50( 0.50) 1.00    1872.7   12400.00
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12425.00 =   25687.61 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     1515.28   51.40    0.670  0.50( 0.49) 0.98    3716.4   12300.00
      2     1511.92   54.14    0.653  0.50( 0.49) 0.97    3993.1   12330.00
      3     1446.18   73.67    0.571  0.50( 0.48) 0.97    5809.6   12211.00
      4     1391.21   81.12    0.545  0.50( 0.48) 0.97    6485.7   12201.00
      5     1314.30   88.19    0.521  0.50( 0.48) 0.97    7007.8   12111.00
      6     1254.63   92.85    0.510  0.50( 0.48) 0.97    7363.9   12231.00
      7     1154.93  100.04    0.496  0.50( 0.48) 0.97    7844.7   12261.00
      8     1139.24  100.97    0.494  0.50( 0.48) 0.97    7890.0   12101.10
      9      822.15  123.83    0.453  0.50( 0.49) 0.97    8886.8   12010.00
     10      621.31  138.46    0.435  0.50( 0.49) 0.97    9014.4   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     1790.42   51.40    0.670  0.50( 0.49) 0.98    5107.8   12300.00
      2     1787.05   54.14    0.653  0.50( 0.49) 0.98    5458.5   12330.00
      3     1755.23   63.59    0.605  0.50( 0.49) 0.98    6593.7   12410.00
      4     1703.15   72.00    0.577  0.50( 0.49) 0.98    7527.4   12400.00
      5     1678.83   73.67    0.571  0.50( 0.49) 0.98    7682.3   12211.00
      6     1540.13   81.12    0.545  0.50( 0.49) 0.98    8358.4   12201.00
      7     1383.81   88.19    0.521  0.50( 0.49) 0.97    8880.5   12111.00
      8     1285.82   92.85    0.510  0.50( 0.49) 0.97    9236.6   12231.00
      9     1154.92  100.04    0.496  0.50( 0.49) 0.97    9717.3   12261.00
     10     1139.24  100.97    0.494  0.50( 0.49) 0.97    9762.7   12101.10
     11      822.15  123.83    0.453  0.50( 0.49) 0.98   10759.5   12010.00
     12      621.30  138.46    0.435  0.50( 0.49) 0.98   10887.1   12000.00
    TOTAL AREA(ACRES) =     10887.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1790.42  Tc(MIN.) =   51.403
  EFFECTIVE AREA(ACRES) =   5107.76  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =    10887.1
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12425.00 TO NODE  12520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    572.29  DOWNSTREAM(FEET) =    549.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1724.25   CHANNEL SLOPE =  0.0130
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.646
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED                -      117.96      0.50      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1798.17
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
AVERAGE FLOW DEPTH(FEET) =   8.99   TRAVEL TIME(MIN.) =   3.88
Tc(MIN.) =   55.28
SUBAREA AREA(ACRES) =   117.96       SUBAREA RUNOFF(CFS) =   15.51
EFFECTIVE AREA(ACRES) =   5225.72     AREA-AVERAGED Fm(INCH/HR) =   0.49
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
TOTAL AREA(ACRES) =    11005.0         PEAK FLOW RATE(CFS) =    1790.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  8.98   FLOW VELOCITY(FEET/SEC.) =   7.41
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12520.00 =   58224.71 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  11
----------------------------------------------------------------------------
>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

** MAIN STREAM CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1     1790.42   55.28    0.646  0.50( 0.49) 0.98    5225.7   12300.00
    2     1787.05   58.02    0.630  0.50( 0.49) 0.98    5576.5   12330.00
    3     1755.23   67.49    0.592  0.50( 0.49) 0.98    6711.7   12410.00
    4     1703.15   75.93    0.563  0.50( 0.49) 0.98    7645.4   12400.00
    5     1678.83   77.61    0.557  0.50( 0.49) 0.98    7800.3   12211.00
    6     1540.13   85.15    0.532  0.50( 0.49) 0.98    8476.3   12201.00
    7     1383.81   92.33    0.511  0.50( 0.49) 0.97    8998.4   12111.00
    8     1285.82   97.06    0.502  0.50( 0.49) 0.97    9354.6   12231.00
    9     1154.92  104.36    0.488  0.50( 0.49) 0.97    9835.3   12261.00
   10     1139.24  105.31    0.486  0.50( 0.49) 0.97    9880.7   12101.10
   11      822.15  128.54    0.447  0.50( 0.49) 0.98   10877.4   12010.00
   12      621.30  143.51    0.429  0.50( 0.49) 0.98   11005.0   12000.00
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12520.00 =   58224.71 FEET.

** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1      102.89   36.95    0.800  0.50( 0.50) 1.00     366.3   12500.00
LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12520.00 =   10171.83 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1     1893.31   36.95    0.800  0.50( 0.49) 0.98    3859.5   12500.00
    2     1840.62   55.28    0.646  0.50( 0.49) 0.98    5592.0   12300.00
    3     1831.53   58.02    0.630  0.50( 0.49) 0.98    5942.8   12330.00
    4     1786.78   67.49    0.592  0.50( 0.49) 0.98    7078.0   12410.00
    5     1724.80   75.93    0.563  0.50( 0.49) 0.98    8011.6   12400.00
    6     1698.50   77.61    0.557  0.50( 0.49) 0.98    8166.6   12211.00
    7     1550.96   85.15    0.532  0.50( 0.49) 0.98    8842.6   12201.00
```



```
    8     1387.41   92.33    0.511  0.50( 0.49) 0.98    9364.7   12111.00
    9     1286.30   97.06    0.502  0.50( 0.49) 0.97    9720.9   12231.00
   10     1154.92  104.36    0.488  0.50( 0.49) 0.97   10201.6   12261.00
   11     1139.24  105.31    0.486  0.50( 0.49) 0.97   10247.0   12101.10
   12      822.15  128.54    0.447  0.50( 0.49) 0.98   11243.7   12010.00
   13      621.30  143.51    0.429  0.50( 0.49) 0.98   11371.3   12000.00
TOTAL AREA(ACRES) =     11371.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =     1893.31  Tc(MIN.) =   36.952
EFFECTIVE AREA(ACRES) =   3859.53  AREA-AVERAGED Fm(INCH/HR) =  0.49
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.98
TOTAL AREA(ACRES) =    11371.3
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12520.00 =   58224.71 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12520.00 TO NODE  12521.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    549.92  DOWNSTREAM(FEET) =    525.43
CHANNEL LENGTH THRU SUBAREA(FEET) =  1934.41   CHANNEL SLOPE =  0.0127
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.751
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED                -       85.91      0.50      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1902.99
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.45
AVERAGE FLOW DEPTH(FEET) =   9.23   TRAVEL TIME(MIN.) =   4.33
Tc(MIN.) =   41.28
SUBAREA AREA(ACRES) =    85.91       SUBAREA RUNOFF(CFS) =   19.36
EFFECTIVE AREA(ACRES) =   3945.44     AREA-AVERAGED Fm(INCH/HR) =   0.49
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
TOTAL AREA(ACRES) =    11457.2         PEAK FLOW RATE(CFS) =    1893.31
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  9.21   FLOW VELOCITY(FEET/SEC.) =   7.45
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12521.00 =   60159.12 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12521.00 TO NODE  12522.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    525.43  DOWNSTREAM(FEET) =    490.87
CHANNEL LENGTH THRU SUBAREA(FEET) =  3335.01   CHANNEL SLOPE =  0.0104
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.684
SUBAREA LOSS RATE DATA(AMC  II):
```

```
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      539.82      0.50      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1938.21
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.95
 AVERAGE FLOW DEPTH(FEET) =   9.64   TRAVEL TIME(MIN.) =   8.00
 Tc(MIN.) =   49.27
 SUBAREA AREA(ACRES) =   539.82       SUBAREA RUNOFF(CFS) =   89.47
 EFFECTIVE AREA(ACRES) =   4485.26     AREA-AVERAGED Fm(INCH/HR) =   0.49
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =    11997.0         PEAK FLOW RATE(CFS) =    1893.31
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.56   FLOW VELOCITY(FEET/SEC.) =   6.91
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12522.00 =   63494.13 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12522.00 TO NODE  12523.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    490.87  DOWNSTREAM(FEET) =    467.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1961.26   CHANNEL SLOPE =  0.0118
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.655
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      321.58      0.50      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1915.80
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.28
 AVERAGE FLOW DEPTH(FEET) =   9.36   TRAVEL TIME(MIN.) =   4.49
 Tc(MIN.) =   53.76
 SUBAREA AREA(ACRES) =   321.58       SUBAREA RUNOFF(CFS) =   44.94
 EFFECTIVE AREA(ACRES) =   4806.84     AREA-AVERAGED Fm(INCH/HR) =   0.49
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =    12318.6         PEAK FLOW RATE(CFS) =    1893.31
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.32   FLOW VELOCITY(FEET/SEC.) =   7.27
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12523.00 =   65455.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12523.00 TO NODE  12524.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    467.63  DOWNSTREAM(FEET) =    436.35
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2841.85   CHANNEL SLOPE =  0.0110
```



```
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.616
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      298.62      0.50      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1908.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.08
 AVERAGE FLOW DEPTH(FEET) =   9.48   TRAVEL TIME(MIN.) =   6.69
 Tc(MIN.) =   60.45
 SUBAREA AREA(ACRES) =   298.62       SUBAREA RUNOFF(CFS) =   31.13
 EFFECTIVE AREA(ACRES) =   5105.46     AREA-AVERAGED Fm(INCH/HR) =   0.49
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =    12617.2         PEAK FLOW RATE(CFS) =    1893.31
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.45   FLOW VELOCITY(FEET/SEC.) =   7.07
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12524.00 =   68297.24 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12524.00 TO NODE  12525.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    436.35  DOWNSTREAM(FEET) =    415.23
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2812.14   CHANNEL SLOPE =  0.0075
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.590
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      251.20      0.50      0.997     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1903.64
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.13
 AVERAGE FLOW DEPTH(FEET) =  10.17   TRAVEL TIME(MIN.) =   7.65
 Tc(MIN.) =   68.10
 SUBAREA AREA(ACRES) =   251.20       SUBAREA RUNOFF(CFS) =   20.63
 EFFECTIVE AREA(ACRES) =   5356.66     AREA-AVERAGED Fm(INCH/HR) =   0.49
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =    12868.4         PEAK FLOW RATE(CFS) =    1893.31
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.15   FLOW VELOCITY(FEET/SEC.) =   6.12
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12525.00 =   71109.38 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12525.00 TO NODE  12526.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    415.23  DOWNSTREAM(FEET) =    380.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2934.09   CHANNEL SLOPE =  0.0119
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.567
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      247.71      0.50     0.987     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.987
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1901.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.28
  AVERAGE FLOW DEPTH(FEET) =   9.33   TRAVEL TIME(MIN.) =   6.71
  Tc(MIN.) =   74.81
  SUBAREA AREA(ACRES) =   247.71       SUBAREA RUNOFF(CFS) =   16.34
  EFFECTIVE AREA(ACRES) =   5604.37     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    13116.2         PEAK FLOW RATE(CFS) =    1893.31
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.31   FLOW VELOCITY(FEET/SEC.) =   7.28
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12526.00 =   74043.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.28  DOWNSTREAM(FEET) =    347.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3113.51   CHANNEL SLOPE =  0.0105
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.542
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      120.94      0.50     0.974     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.974
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1896.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.95
  AVERAGE FLOW DEPTH(FEET) =   9.53   TRAVEL TIME(MIN.) =   7.46
  Tc(MIN.) =   82.28
  SUBAREA AREA(ACRES) =   120.94       SUBAREA RUNOFF(CFS) =    5.91
  EFFECTIVE AREA(ACRES) =   5725.31     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    13237.1         PEAK FLOW RATE(CFS) =    1893.31
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.53   FLOW VELOCITY(FEET/SEC.) =   6.95
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12527.00 =   77156.98 FEET.
================================================================================
```



```
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    13237.1  TC(MIN.) =     82.28
  EFFECTIVE AREA(ACRES) =   5725.31  AREA-AVERAGED Fm(INCH/HR)=  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.988
  PEAK FLOW RATE(CFS)   =    1893.31

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     1893.31   82.28    0.542  0.50( 0.49) 0.99    5725.3   12500.00
      2     1840.62  100.98    0.494  0.50( 0.49) 0.99    7457.8   12300.00
      3     1831.53  103.77    0.489  0.50( 0.49) 0.99    7808.6   12330.00
      4     1786.78  113.56    0.470  0.50( 0.49) 0.98    8943.7   12410.00
      5     1724.80  122.42    0.455  0.50( 0.49) 0.98    9877.4   12400.00
      6     1698.50  124.28    0.452  0.50( 0.49) 0.98   10032.3   12211.00
      7     1550.96  132.89    0.442  0.50( 0.49) 0.98   10708.4   12201.00
      8     1387.41  141.42    0.432  0.50( 0.49) 0.98   11230.5   12111.00
      9     1286.30  147.09    0.425  0.50( 0.49) 0.98   11586.7   12231.00
     10     1154.92  155.75    0.414  0.50( 0.49) 0.98   12067.4   12261.00
     11     1139.24  156.89    0.413  0.50( 0.49) 0.98   12112.7   12101.10
     12      822.15  184.49    0.383  0.50( 0.49) 0.98   13109.5   12010.00
     13      621.30  203.50    0.372  0.50( 0.49) 0.98   13237.1   12000.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S26.DAT
  TIME/DATE OF STUDY: 08:14 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.738
   2)   10.00;  1.814
   3)   15.00;  1.325
   4)   20.00;  1.135
   5)   25.00;  0.988
   6)   30.00;  0.885
   7)   40.00;  0.759
   8)   50.00;  0.676
   9)   60.00;  0.615
  10)   90.00;  0.513
  11)  120.00;  0.455
  12)  180.00;  0.383
  13)  360.00;  0.284
  14) 1200.00;  0.125
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S19.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     9346.91   19.88  0.50( 0.50) 0.99    5451.5   40200.00
      2     9295.66   38.03  0.50( 0.50) 0.99   10540.5   40120.00
      3     9267.97   43.90  0.50( 0.50) 0.99   12119.8   11801.00
      4     9175.90   55.10  0.50( 0.50) 0.99   15330.4   11500.00
      5     9096.95   60.68  0.50( 0.50) 0.99   17259.8   11701.00
      6     8971.81   66.83  0.50( 0.50) 0.99   19379.0   11000.00
      7     8700.08   82.91  0.50( 0.50) 0.99   26233.8   12500.00
      8     8514.89   88.95  0.50( 0.50) 0.99   29104.3   11910.00
      9     7865.37   97.23  0.50( 0.50) 0.99   32393.0   11130.00
     10     7205.10  108.18  0.50( 0.50) 0.99   36061.6   11620.00
     11     6166.68  123.11  0.50( 0.50) 0.99   40599.1   12400.00
     12     5339.70  133.60  0.50( 0.50) 0.99   42895.9   12201.00
     13     4743.38  142.16  0.50( 0.50) 0.99   44185.0   12111.00
     14     4396.83  147.33  0.50( 0.50) 0.99   44937.7   10700.00
     15     3833.33  156.53  0.50( 0.50) 0.99   46112.0   12261.00
     16     3370.40  165.03  0.50( 0.50) 0.99   46923.8   10200.00
     17     2817.44  179.14  0.50( 0.50) 0.99   48161.1   10300.00
     18     2591.11  185.35  0.50( 0.50) 0.99   48512.2   12010.00
     19     2126.14  204.40  0.50( 0.50) 0.99   48841.6   12000.00
     20     1189.40  268.26  0.50( 0.50) 0.99   49511.8   10100.00
   TOTAL AREA(ACRES) =    49511.8

**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     9346.91   19.88  0.50( 0.50) 0.99    5451.5   40200.00
      2     9295.66   38.03  0.50( 0.50) 0.99   10540.5   40120.00
      3     9267.97   43.90  0.50( 0.50) 0.99   12119.8   11801.00
      4     9175.90   55.10  0.50( 0.50) 0.99   15330.4   11500.00
      5     9096.95   60.68  0.50( 0.50) 0.99   17259.8   11701.00
      6     8971.81   66.83  0.50( 0.50) 0.99   19379.0   11000.00
      7     8700.08   82.91  0.50( 0.50) 0.99   26233.8   12500.00
      8     8514.89   88.95  0.50( 0.50) 0.99   29104.3   11910.00
      9     7865.37   97.23  0.50( 0.50) 0.99   32393.0   11130.00
     10     7205.10  108.18  0.50( 0.50) 0.99   36061.6   11620.00
     11     6166.68  123.11  0.50( 0.50) 0.99   40599.1   12400.00
     12     5339.70  133.60  0.50( 0.50) 0.99   42895.9   12201.00
     13     4743.38  142.16  0.50( 0.50) 0.99   44185.0   12111.00
     14     4396.83  147.33  0.50( 0.50) 0.99   44937.7   10700.00
     15     3833.33  156.53  0.50( 0.50) 0.99   46112.0   12261.00
     16     3370.40  165.03  0.50( 0.50) 0.99   46923.8   10200.00
     17     2817.44  179.14  0.50( 0.50) 0.99   48161.1   10300.00
     18     2591.11  185.35  0.50( 0.50) 0.99   48512.2   12010.00
```

```
     19     2126.14  204.40  0.50( 0.50) 0.99   48841.6   12000.00
     20     1189.40  268.26  0.50( 0.50) 0.99   49511.8   10100.00
    TOTAL AREA(ACRES) =     49511.8

****************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  12601.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    341.63  DOWNSTREAM(FEET) =    325.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1467.93   CHANNEL SLOPE =  0.0113
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.098
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.11      0.50     0.992     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9350.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.90
  AVERAGE FLOW DEPTH(FEET) =  13.19   TRAVEL TIME(MIN.) =   1.37
  Tc(MIN.) =   21.25
  SUBAREA AREA(ACRES) =    14.11       SUBAREA RUNOFF(CFS) =    7.65
  EFFECTIVE AREA(ACRES) =   5465.57     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    49525.9         PEAK FLOW RATE(CFS) =    9346.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.19   FLOW VELOCITY(FEET/SEC.) =  17.90
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9346.91   21.25    1.098  0.50( 0.50) 0.99    5465.6   40200.00
      2     9295.66   39.39    0.767  0.50( 0.50) 0.99   10554.6   40120.00
      3     9267.97   45.27    0.715  0.50( 0.50) 0.99   12134.0   11801.00
      4     9175.90   56.47    0.637  0.50( 0.50) 0.99   15344.5   11500.00
      5     9096.95   62.05    0.608  0.50( 0.50) 0.99   17273.9   11701.00
      6     8971.81   68.21    0.587  0.50( 0.50) 0.99   19393.2   11000.00
      7     8700.08   84.31    0.532  0.50( 0.50) 0.99   26247.9   12500.00
      8     8514.89   90.35    0.512  0.50( 0.50) 0.99   29118.4   11910.00
      9     7865.37   98.66    0.496  0.50( 0.50) 0.99   32407.1   11130.00
     10     7205.10  109.64    0.475  0.50( 0.50) 0.99   36075.7   11620.00
     11     6166.68  124.63    0.449  0.50( 0.50) 0.99   40613.3   12400.00
     12     5339.70  135.18    0.437  0.50( 0.50) 0.99   42910.0   12201.00
     13     4743.38  143.78    0.426  0.50( 0.50) 0.99   44199.1   12111.00
     14     4396.83  148.98    0.420  0.50( 0.50) 0.99   44951.8   10700.00
     15     3833.33  158.24    0.409  0.50( 0.50) 0.99   46126.1   12261.00
     16     3370.40  166.80    0.399  0.50( 0.50) 0.99   46937.9   10200.00
     17     2817.44  180.98    0.382  0.50( 0.50) 0.99   48175.2   10300.00
     18     2591.11  187.23    0.379  0.50( 0.50) 0.99   48526.3   12010.00
     19     2126.14  206.38    0.368  0.50( 0.50) 0.99   48855.7   12000.00
     20     1189.40  270.55    0.333  0.50( 0.50) 0.99   49525.9   10100.00
```



```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    9346.91  Tc(MIN.) =   21.25
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    5465.57

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610318U.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       67.20   19.07  0.50( 0.50) 1.00     108.7   31800.00
      2       60.00   23.05  0.50( 0.50) 1.00     119.0   31810.00
    TOTAL AREA(ACRES) =      119.0

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9346.91   21.25    1.098  0.50( 0.50) 0.99    5465.6   40200.00
      2     9295.66   39.39    0.767  0.50( 0.50) 0.99   10554.6   40120.00
      3     9267.97   45.27    0.715  0.50( 0.50) 0.99   12134.0   11801.00
      4     9175.90   56.47    0.637  0.50( 0.50) 0.99   15344.5   11500.00
      5     9096.95   62.05    0.608  0.50( 0.50) 0.99   17273.9   11701.00
      6     8971.81   68.21    0.587  0.50( 0.50) 0.99   19393.2   11000.00
      7     8700.08   84.31    0.532  0.50( 0.50) 0.99   26247.9   12500.00
      8     8514.89   90.35    0.512  0.50( 0.50) 0.99   29118.4   11910.00
      9     7865.37   98.66    0.496  0.50( 0.50) 0.99   32407.1   11130.00
     10     7205.10  109.64    0.475  0.50( 0.50) 0.99   36075.7   11620.00
     11     6166.68  124.63    0.449  0.50( 0.50) 0.99   40613.3   12400.00
     12     5339.70  135.18    0.437  0.50( 0.50) 0.99   42910.0   12201.00
     13     4743.38  143.78    0.426  0.50( 0.50) 0.99   44199.1   12111.00
     14     4396.83  148.98    0.420  0.50( 0.50) 0.99   44951.8   10700.00
     15     3833.33  158.24    0.409  0.50( 0.50) 0.99   46126.1   12261.00
     16     3370.40  166.80    0.399  0.50( 0.50) 0.99   46937.9   10200.00
     17     2817.44  180.98    0.382  0.50( 0.50) 0.99   48175.2   10300.00
     18     2591.11  187.23    0.379  0.50( 0.50) 0.99   48526.3   12010.00
     19     2126.14  206.38    0.368  0.50( 0.50) 0.99   48855.7   12000.00
     20     1189.40  270.55    0.333  0.50( 0.50) 0.99   49525.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       67.20   19.07    1.170  0.50( 0.50) 1.00     108.7   31800.00
      2       60.00   23.05    1.045  0.50( 0.50) 1.00     119.0   31810.00
  LONGEST FLOWPATH FROM NODE  31810.00 TO NODE  12601.00 =    4599.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	9414.11	19.07	1.170	0.50(0.50)	0.99	5014.0	31800.00
2	9410.17	21.25	1.098	0.50(0.50)	0.99	5579.9	40200.00
3	9401.81	23.05	1.045	0.50(0.50)	0.99	6090.8	31810.00
4	9324.99	39.39	0.767	0.50(0.50)	0.99	10673.7	40120.00
5	9291.65	45.27	0.715	0.50(0.50)	0.99	12253.0	11801.00
6	9190.91	56.47	0.637	0.50(0.50)	0.99	15463.5	11500.00
7	9108.82	62.05	0.608	0.50(0.50)	0.99	17392.9	11701.00
8	8981.38	68.21	0.587	0.50(0.50)	0.99	19512.2	11000.00
9	8703.62	84.31	0.532	0.50(0.50)	0.99	26366.9	12500.00
10	8516.23	90.35	0.512	0.50(0.50)	0.99	29237.4	11910.00
11	7865.37	98.66	0.496	0.50(0.50)	0.99	32526.2	11130.00
12	7205.10	109.64	0.475	0.50(0.50)	0.99	36194.7	11620.00
13	6166.68	124.63	0.449	0.50(0.50)	0.99	40732.3	12400.00
14	5339.70	135.18	0.437	0.50(0.50)	0.99	43029.0	12201.00
15	4743.38	143.78	0.426	0.50(0.50)	0.99	44318.2	12111.00
16	4396.83	148.98	0.420	0.50(0.50)	0.99	45070.8	10700.00
17	3833.33	158.24	0.409	0.50(0.50)	0.99	46245.1	12261.00
18	3370.40	166.80	0.399	0.50(0.50)	0.99	47056.9	10200.00
19	2817.44	180.98	0.382	0.50(0.50)	0.99	48294.3	10300.00
20	2591.11	187.23	0.379	0.50(0.50)	0.99	48645.4	12010.00
21	2126.13	206.38	0.368	0.50(0.50)	0.99	48974.7	12000.00
22	1189.40	270.55	0.333	0.50(0.50)	0.99	49644.9	10100.00

TOTAL AREA(ACRES) = 49644.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 9414.11 Tc(MIN.) = 19.072
EFFECTIVE AREA(ACRES) = 5014.00 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49644.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

****
FLOW PROCESS FROM NODE 12601.00 TO NODE 12602.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 325.00 DOWNSTREAM(FEET) = 313.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1377.46 CHANNEL SLOPE = 0.0087
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 9414.11
FLOW VELOCITY(FEET/SEC.) = 16.25 FLOW DEPTH(FEET) = 13.90
TRAVEL TIME(MIN.) = 1.41 Tc(MIN.) = 20.48
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12602.00 = 101245.91 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)		Ap	Ae (ACRES)	HEADWATER NODE
1	9414.11	20.48	1.121	0.50(0.50)		0.99	5014.0	31800.00
2	9410.17	22.66	1.057	0.50(0.50)		0.99	5579.9	40200.00
3	9401.81	24.47	1.004	0.50(0.50)		0.99	6090.8	31810.00
4	9324.99	40.81	0.752	0.50(0.50)		0.99	10673.7	40120.00
5	9291.65	46.68	0.704	0.50(0.50)		0.99	12253.0	11801.00
6	9190.91	57.89	0.628	0.50(0.50)		0.99	15463.5	11500.00
7	9108.82	63.48	0.603	0.50(0.50)		0.99	17392.9	11701.00
8	8981.38	69.64	0.582	0.50(0.50)		0.99	19512.2	11000.00

9	8703.62	85.75	0.527	0.50(0.50)	0.99	26366.9	12500.00
10	8516.23	91.80	0.510	0.50(0.50)	0.99	29237.4	11910.00
11	7865.37	100.14	0.493	0.50(0.50)	0.99	32526.2	11130.00
12	7205.10	111.15	0.472	0.50(0.50)	0.99	36194.7	11620.00
13	6166.68	126.20	0.448	0.50(0.50)	0.99	40732.3	12400.00
14	5339.70	136.80	0.435	0.50(0.50)	0.99	43029.0	12201.00
15	4743.38	145.45	0.424	0.50(0.50)	0.99	44318.2	12111.00
16	4396.83	150.69	0.418	0.50(0.50)	0.99	45070.8	10700.00
17	3833.33	160.01	0.407	0.50(0.50)	0.99	46245.1	12261.00
18	3370.40	168.62	0.397	0.50(0.50)	0.99	47056.9	10200.00
19	2817.44	182.89	0.381	0.50(0.50)	0.99	48294.3	10300.00
20	2591.11	189.18	0.378	0.50(0.50)	0.99	48645.4	12010.00
21	2126.13	208.43	0.367	0.50(0.50)	0.99	48974.7	12000.00
22	1189.40	272.92	0.332	0.50(0.50)	0.99	49644.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 9414.11 Tc(MIN.) = 20.48
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 5014.00

****
FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 313.00 DOWNSTREAM(FEET) = 310.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 312.40 CHANNEL SLOPE = 0.0096
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 9414.11
FLOW VELOCITY(FEET/SEC.) = 16.86 FLOW DEPTH(FEET) = 13.64
TRAVEL TIME(MIN.) = 0.31 Tc(MIN.) = 20.79
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)		Ap	Ae (ACRES)	HEADWATER NODE
1	9414.11	20.79	1.112	0.50(0.50)		0.99	5014.0	31800.00
2	9410.17	22.97	1.048	0.50(0.50)		0.99	5579.9	40200.00
3	9401.81	24.78	0.995	0.50(0.50)		0.99	6090.8	31810.00
4	9324.99	41.12	0.750	0.50(0.50)		0.99	10673.7	40120.00
5	9291.65	46.99	0.701	0.50(0.50)		0.99	12253.0	11801.00
6	9190.91	58.20	0.626	0.50(0.50)		0.99	15463.5	11500.00
7	9108.82	63.79	0.602	0.50(0.50)		0.99	17392.9	11701.00
8	8981.38	69.95	0.581	0.50(0.50)		0.99	19512.2	11000.00
9	8703.62	86.06	0.526	0.50(0.50)		0.99	26366.9	12500.00
10	8516.23	92.12	0.509	0.50(0.50)		0.99	29237.4	11910.00
11	7865.37	100.46	0.493	0.50(0.50)		0.99	32526.2	11130.00
12	7205.10	111.48	0.471	0.50(0.50)		0.99	36194.7	11620.00
13	6166.68	126.54	0.447	0.50(0.50)		0.99	40732.3	12400.00
14	5339.70	137.16	0.434	0.50(0.50)		0.99	43029.0	12201.00
15	4743.38	145.82	0.424	0.50(0.50)		0.99	44318.2	12111.00
16	4396.83	151.06	0.418	0.50(0.50)		0.99	45070.8	10700.00
17	3833.33	160.40	0.407	0.50(0.50)		0.99	46245.1	12261.00
18	3370.40	169.02	0.396	0.50(0.50)		0.99	47056.9	10200.00
19	2817.44	183.31	0.381	0.50(0.50)		0.99	48294.3	10300.00
20	2591.11	189.61	0.378	0.50(0.50)		0.99	48645.4	12010.00
21	2126.13	208.88	0.367	0.50(0.50)		0.99	48974.7	12000.00

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    22     1189.40  273.44    0.332  0.50( 0.50) 0.99   49644.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    9414.11  Tc(MIN.) =   20.79
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    5014.00

****************************************************************************
  FLOW PROCESS FROM NODE  12602.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610317U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       38.81   18.17  0.50( 0.50) 1.00      61.8   31700.00
      2       35.35   22.85  0.50( 0.50) 1.00      71.3   31710.00
    TOTAL AREA(ACRES) =       71.3

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9414.11   20.79    1.112  0.50( 0.50) 0.99    5014.0   31800.00
      2     9410.17   22.97    1.048  0.50( 0.50) 0.99    5579.9   40200.00
      3     9401.81   24.78    0.995  0.50( 0.50) 0.99    6090.8   31810.00
      4     9324.99   41.12    0.750  0.50( 0.50) 0.99   10673.7   40120.00
      5     9291.65   46.99    0.701  0.50( 0.50) 0.99   12253.0   11801.00
      6     9190.91   58.20    0.626  0.50( 0.50) 0.99   15463.5   11500.00
      7     9108.82   63.79    0.602  0.50( 0.50) 0.99   17392.9   11701.00
      8     8981.38   69.95    0.581  0.50( 0.50) 0.99   19512.2   11000.00
      9     8703.62   86.06    0.526  0.50( 0.50) 0.99   26366.9   12500.00
     10     8516.23   92.12    0.509  0.50( 0.50) 0.99   29237.4   11910.00
     11     7865.37  100.46    0.493  0.50( 0.50) 0.99   32526.2   11130.00
     12     7205.10  111.48    0.471  0.50( 0.50) 0.99   36194.7   11620.00
     13     6166.68  126.54    0.447  0.50( 0.50) 0.99   40732.3   12400.00
     14     5339.70  137.16    0.434  0.50( 0.50) 0.99   43029.0   12201.00
     15     4743.38  145.82    0.424  0.50( 0.50) 0.99   44318.2   12111.00
     16     4396.83  151.06    0.418  0.50( 0.50) 0.99   45070.8   10700.00
     17     3833.33  160.40    0.407  0.50( 0.50) 0.99   46245.1   12261.00
     18     3370.40  169.02    0.396  0.50( 0.50) 0.99   47056.9   10200.00
     19     2817.44  183.31    0.381  0.50( 0.50) 0.99   48294.3   10300.00
     20     2591.11  189.61    0.378  0.50( 0.50) 0.99   48645.4   12010.00
     21     2126.13  208.88    0.367  0.50( 0.50) 0.99   48974.7   12000.00
     22     1189.40  273.44    0.332  0.50( 0.50) 0.99   49644.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.
```



```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       38.81   18.17    1.204  0.50( 0.50) 1.00      61.8   31700.00
      2       35.35   22.85    1.051  0.50( 0.50) 1.00      71.3   31710.00
  LONGEST FLOWPATH FROM NODE  31710.00 TO NODE  12603.00 =    3633.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9452.92   18.17    1.204  0.50( 0.50) 0.99    4444.5   31700.00
      2     9450.98   20.79    1.112  0.50( 0.50) 0.99    5081.1   31800.00
      3     9445.75   22.85    1.051  0.50( 0.50) 0.99    5618.9   31710.00
      4     9445.29   22.97    1.048  0.50( 0.50) 0.99    5651.2   40200.00
      5     9433.53   24.78    0.995  0.50( 0.50) 0.99    6162.1   31810.00
      6     9341.00   41.12    0.750  0.50( 0.50) 0.99   10744.9   40120.00
      7     9304.52   46.99    0.701  0.50( 0.50) 0.99   12324.2   11801.00
      8     9198.97   58.20    0.626  0.50( 0.50) 0.99   15534.8   11500.00
      9     9115.35   63.79    0.602  0.50( 0.50) 0.99   17464.2   11701.00
     10     8986.57   69.95    0.581  0.50( 0.50) 0.99   19583.5   11000.00
     11     8705.30   86.06    0.526  0.50( 0.50) 0.99   26438.2   12500.00
     12     8516.79   92.12    0.509  0.50( 0.50) 0.99   29308.7   11910.00
     13     7865.37  100.46    0.493  0.50( 0.50) 0.99   32597.4   11130.00
     14     7205.10  111.48    0.471  0.50( 0.50) 0.99   36266.0   11620.00
     15     6166.68  126.54    0.447  0.50( 0.50) 0.99   40803.6   12400.00
     16     5339.70  137.16    0.434  0.50( 0.50) 0.99   43100.3   12201.00
     17     4743.38  145.82    0.424  0.50( 0.50) 0.99   44389.4   12111.00
     18     4396.83  151.06    0.418  0.50( 0.50) 0.99   45142.1   10700.00
     19     3833.33  160.40    0.407  0.50( 0.50) 0.99   46316.4   12261.00
     20     3370.40  169.02    0.396  0.50( 0.50) 0.99   47128.2   10200.00
     21     2817.44  183.31    0.381  0.50( 0.50) 0.99   48365.5   10300.00
     22     2591.11  189.61    0.378  0.50( 0.50) 0.99   48716.6   12010.00
     23     2126.13  208.88    0.367  0.50( 0.50) 0.99   49046.0   12000.00
     24     1189.40  273.44    0.332  0.50( 0.50) 0.99   49716.2   10100.00
    TOTAL AREA(ACRES) =     49716.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     9452.92  Tc(MIN.) =   18.175
  EFFECTIVE AREA(ACRES) =   4444.49  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49716.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610403U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
```

```
      1       93.93   21.90  0.50( 0.48) 0.97     175.0   40300.00
    TOTAL AREA(ACRES) =      175.0

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9452.92   18.17    1.204  0.50( 0.50) 0.99    4444.5   31700.00
      2     9450.98   20.79    1.112  0.50( 0.50) 0.99    5081.1   31800.00
      3     9445.75   22.85    1.051  0.50( 0.50) 0.99    5618.9   31710.00
      4     9445.29   22.97    1.048  0.50( 0.50) 0.99    5651.2   40200.00
      5     9433.53   24.78    0.995  0.50( 0.50) 0.99    6162.1   31810.00
      6     9341.00   41.12    0.750  0.50( 0.50) 0.99   10744.9   40120.00
      7     9304.52   46.99    0.701  0.50( 0.50) 0.99   12324.2   11801.00
      8     9198.97   58.20    0.626  0.50( 0.50) 0.99   15534.8   11500.00
      9     9115.35   63.79    0.602  0.50( 0.50) 0.99   17464.2   11701.00
     10     8986.57   69.95    0.581  0.50( 0.50) 0.99   19583.5   11000.00
     11     8705.30   86.06    0.526  0.50( 0.50) 0.99   26438.2   12500.00
     12     8516.79   92.12    0.509  0.50( 0.50) 0.99   29308.7   11910.00
     13     7865.37  100.46    0.493  0.50( 0.50) 0.99   32597.4   11130.00
     14     7205.10  111.48    0.471  0.50( 0.50) 0.99   36266.0   11620.00
     15     6166.68  126.54    0.447  0.50( 0.50) 0.99   40803.6   12400.00
     16     5339.70  137.16    0.434  0.50( 0.50) 0.99   43100.3   12201.00
     17     4743.38  145.82    0.424  0.50( 0.50) 0.99   44389.4   12111.00
     18     4396.83  151.06    0.418  0.50( 0.50) 0.99   45142.1   10700.00
     19     3833.33  160.40    0.407  0.50( 0.50) 0.99   46316.4   12261.00
     20     3370.40  169.02    0.396  0.50( 0.50) 0.99   47128.2   10200.00
     21     2817.44  183.31    0.381  0.50( 0.50) 0.99   48365.5   10300.00
     22     2591.11  189.61    0.378  0.50( 0.50) 0.99   48716.6   12010.00
     23     2126.13  208.88    0.367  0.50( 0.50) 0.99   49046.0   12000.00
     24     1189.40  273.44    0.332  0.50( 0.50) 0.99   49716.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       93.93   21.90    1.079  0.50( 0.48) 0.97     175.0   40300.00
  LONGEST FLOWPATH FROM NODE  40300.00 TO NODE  12603.00 =    5256.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9546.86   18.17    1.204  0.50( 0.50) 0.99    4589.8   31700.00
      2     9544.92   20.79    1.112  0.50( 0.50) 0.99    5247.3   31800.00
      3     9542.10   21.90    1.079  0.50( 0.50) 0.99    5545.8   40300.00
      4     9535.29   22.85    1.051  0.50( 0.50) 0.99    5794.0   31710.00
      5     9534.26   22.97    1.048  0.50( 0.50) 0.99    5826.2   40200.00
      6     9514.13   24.78    0.995  0.50( 0.50) 0.99    6337.1   31810.00
      7     9383.04   41.12    0.750  0.50( 0.50) 0.99   10920.0   40120.00
      8     9338.89   46.99    0.701  0.50( 0.50) 0.99   12499.3   11801.00
      9     9221.52   58.20    0.626  0.50( 0.50) 0.99   15709.8   11500.00
     10     9134.15   63.79    0.602  0.50( 0.50) 0.99   17639.3   11701.00
     11     9002.07   69.95    0.581  0.50( 0.50) 0.99   19758.5   11000.00
```



```
     12     8712.17   86.06    0.526  0.50( 0.50) 0.99   26613.2   12500.00
     13     8520.90   92.12    0.509  0.50( 0.50) 0.99   29483.7   11910.00
     14     7868.07  100.46    0.493  0.50( 0.50) 0.99   32772.5   11130.00
     15     7207.68  111.48    0.471  0.50( 0.50) 0.99   36441.0   11620.00
     16     6169.13  126.54    0.447  0.50( 0.50) 0.99   40978.6   12400.00
     17     5342.08  137.16    0.434  0.50( 0.50) 0.99   43275.3   12201.00
     18     4745.70  145.82    0.424  0.50( 0.50) 0.99   44564.5   12111.00
     19     4399.12  151.06    0.418  0.50( 0.50) 0.99   45317.1   10700.00
     20     3835.56  160.40    0.407  0.50( 0.50) 0.99   46491.5   12261.00
     21     3372.57  169.02    0.396  0.50( 0.50) 0.99   47303.2   10200.00
     22     2819.53  183.31    0.381  0.50( 0.50) 0.99   48540.6   10300.00
     23     2593.18  189.61    0.378  0.50( 0.50) 0.99   48891.7   12010.00
     24     2128.15  208.88    0.367  0.50( 0.50) 0.99   49221.0   12000.00
     25     1191.22  273.44    0.332  0.50( 0.50) 0.99   49891.2   10100.00
   TOTAL AREA(ACRES) =     49891.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     9546.86  Tc(MIN.) =   18.175
  EFFECTIVE AREA(ACRES) =   4589.77  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49891.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12604.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    310.00  DOWNSTREAM(FEET) =    307.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.69   CHANNEL SLOPE =  0.0065
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    9546.86
  FLOW VELOCITY(FEET/SEC.) =  14.64   FLOW DEPTH(FEET) =  14.74
  TRAVEL TIME(MIN.) =   0.52   Tc(MIN.) =   18.70
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12604.00 =  102017.99 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9546.86   18.70    1.184  0.50( 0.50) 0.99    4589.8   31700.00
      2     9544.92   21.32    1.096  0.50( 0.50) 0.99    5247.3   31800.00
      3     9542.10   22.42    1.064  0.50( 0.50) 0.99    5545.8   40300.00
      4     9535.29   23.37    1.036  0.50( 0.50) 0.99    5794.0   31710.00
      5     9534.26   23.49    1.032  0.50( 0.50) 0.99    5826.2   40200.00
      6     9514.13   25.30    0.982  0.50( 0.50) 0.99    6337.1   31810.00
      7     9383.04   41.65    0.745  0.50( 0.50) 0.99   10920.0   40120.00
      8     9338.89   47.52    0.697  0.50( 0.50) 0.99   12499.3   11801.00
      9     9221.52   58.73    0.623  0.50( 0.50) 0.99   15709.8   11500.00
     10     9134.15   64.32    0.600  0.50( 0.50) 0.99   17639.3   11701.00
     11     9002.07   70.48    0.579  0.50( 0.50) 0.99   19758.5   11000.00
     12     8712.17   86.60    0.525  0.50( 0.50) 0.99   26613.2   12500.00
     13     8520.90   92.66    0.508  0.50( 0.50) 0.99   29483.7   11910.00
     14     7868.07  101.01    0.492  0.50( 0.50) 0.99   32772.5   11130.00
     15     7207.68  112.04    0.470  0.50( 0.50) 0.99   36441.0   11620.00
     16     6169.13  127.13    0.446  0.50( 0.50) 0.99   40978.6   12400.00
     17     5342.08  137.76    0.434  0.50( 0.50) 0.99   43275.3   12201.00
```

18	4745.70	146.44	0.423	0.50(0.50)	0.99	44564.5	12111.00
19	4399.12	151.70	0.417	0.50(0.50)	0.99	45317.1	10700.00
20	3835.56	161.05	0.406	0.50(0.50)	0.99	46491.5	12261.00
21	3372.57	169.70	0.395	0.50(0.50)	0.99	47303.2	10200.00
22	2819.53	184.02	0.381	0.50(0.50)	0.99	48540.6	10300.00
23	2593.18	190.33	0.377	0.50(0.50)	0.99	48891.7	12010.00
24	2128.15	209.64	0.367	0.50(0.50)	0.99	49221.0	12000.00
25	1191.22	274.32	0.331	0.50(0.50)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 9546.86 Tc(MIN.) = 18.70
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4589.77

****
FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 307.00 DOWNSTREAM(FEET) = 305.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 427.54 CHANNEL SLOPE = 0.0047
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 9546.86
FLOW VELOCITY(FEET/SEC.) = 12.92 FLOW DEPTH(FEET) = 15.70
TRAVEL TIME(MIN.) = 0.55 Tc(MIN.) = 19.25
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.00 = 102445.53 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9546.86	19.25	1.163	0.50(0.50)	0.99	4589.8	31700.00
2	9544.92	21.87	1.080	0.50(0.50)	0.99	5247.3	31800.00
3	9542.10	22.97	1.048	0.50(0.50)	0.99	5545.8	40300.00
4	9535.29	23.92	1.020	0.50(0.50)	0.99	5794.0	31710.00
5	9534.26	24.05	1.016	0.50(0.50)	0.99	5826.2	40200.00
6	9514.13	25.85	0.970	0.50(0.50)	0.99	6337.1	31810.00
7	9383.04	42.20	0.741	0.50(0.50)	0.99	10920.0	40120.00
8	9338.89	48.08	0.692	0.50(0.50)	0.99	12499.3	11801.00
9	9221.52	59.29	0.619	0.50(0.50)	0.99	15709.8	11500.00
10	9134.15	64.87	0.598	0.50(0.50)	0.99	17639.3	11701.00
11	9002.07	71.04	0.577	0.50(0.50)	0.99	19758.5	11000.00
12	8712.17	87.16	0.523	0.50(0.50)	0.99	26613.2	12500.00
13	8520.90	93.22	0.507	0.50(0.50)	0.99	29483.7	11910.00
14	7868.07	101.59	0.491	0.50(0.50)	0.99	32772.5	11130.00
15	7207.68	112.63	0.469	0.50(0.50)	0.99	36441.0	11620.00
16	6169.13	127.74	0.446	0.50(0.50)	0.99	40978.6	12400.00
17	5342.08	138.40	0.433	0.50(0.50)	0.99	43275.3	12201.00
18	4745.70	147.10	0.422	0.50(0.50)	0.99	44564.5	12111.00
19	4399.12	152.37	0.416	0.50(0.50)	0.99	45317.1	10700.00
20	3835.56	161.75	0.405	0.50(0.50)	0.99	46491.5	12261.00
21	3372.57	170.42	0.394	0.50(0.50)	0.99	47303.2	10200.00

22	2819.53	184.77	0.380	0.50(0.50)	0.99	48540.6	10300.00
23	2593.18	191.10	0.377	0.50(0.50)	0.99	48891.7	12010.00
24	2128.15	210.44	0.366	0.50(0.50)	0.99	49221.0	12000.00
25	1191.22	275.25	0.331	0.50(0.50)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 9546.86 Tc(MIN.) = 19.25
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4589.77

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========
MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12605.00 TO NODE 12605.30 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 305.00 DOWNSTREAM(FEET) = 302.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 217.28 CHANNEL SLOPE = 0.0138
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 9546.86
FLOW VELOCITY(FEET/SEC.) = 19.38 FLOW DEPTH(FEET) = 12.81
TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 19.44
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9546.86	19.44	1.156	0.50(0.50)	0.99	4589.8	31700.00
2	9544.92	22.06	1.075	0.50(0.50)	0.99	5247.3	31800.00
3	9542.10	23.16	1.042	0.50(0.50)	0.99	5545.8	40300.00
4	9535.29	24.11	1.014	0.50(0.50)	0.99	5794.0	31710.00
5	9534.26	24.23	1.011	0.50(0.50)	0.99	5826.2	40200.00
6	9514.13	26.04	0.967	0.50(0.50)	0.99	6337.1	31810.00
7	9383.04	42.39	0.739	0.50(0.50)	0.99	10920.0	40120.00
8	9338.89	48.26	0.690	0.50(0.50)	0.99	12499.3	11801.00
9	9221.52	59.48	0.618	0.50(0.50)	0.99	15709.8	11500.00
10	9134.15	65.06	0.598	0.50(0.50)	0.99	17639.3	11701.00
11	9002.07	71.23	0.577	0.50(0.50)	0.99	19758.5	11000.00
12	8712.17	87.35	0.522	0.50(0.50)	0.99	26613.2	12500.00
13	8520.90	93.41	0.506	0.50(0.50)	0.99	29483.7	11910.00
14	7868.07	101.78	0.490	0.50(0.50)	0.99	32772.5	11130.00
15	7207.68	112.83	0.469	0.50(0.50)	0.99	36441.0	11620.00
16	6169.13	127.95	0.445	0.50(0.50)	0.99	40978.6	12400.00
17	5342.08	138.62	0.433	0.50(0.50)	0.99	43275.3	12201.00
18	4745.70	147.32	0.422	0.50(0.50)	0.99	44564.5	12111.00
19	4399.12	152.60	0.416	0.50(0.50)	0.99	45317.1	10700.00
20	3835.56	161.98	0.405	0.50(0.50)	0.99	46491.5	12261.00
21	3372.57	170.66	0.394	0.50(0.50)	0.99	47303.2	10200.00
22	2819.53	185.02	0.380	0.50(0.50)	0.99	48540.6	10300.00
23	2593.18	191.36	0.377	0.50(0.50)	0.99	48891.7	12010.00
24	2128.15	210.72	0.366	0.50(0.50)	0.99	49221.0	12000.00

```
     25     1191.22  275.56    0.330  0.50( 0.50) 0.99   49891.2   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    9546.86  Tc(MIN.) =   19.44
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4589.77

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
  ***MEMORY BANK #  3 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610404U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      220.21   20.90  0.50( 0.50) 0.99     394.9   40430.00
      2      216.58   21.42  0.50( 0.50) 0.99     398.7   40440.00
      3      203.76   23.10  0.50( 0.50) 0.99     409.8   40400.00
      4      203.62   23.12  0.50( 0.50) 0.99     409.8   40420.00
      5      202.03   23.33  0.50( 0.50) 0.99     410.5   40410.00
    TOTAL AREA(ACRES) =      410.5

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9546.86   19.44    1.156  0.50( 0.50) 0.99    4589.8   31700.00
      2     9544.92   22.06    1.075  0.50( 0.50) 0.99    5247.3   31800.00
      3     9542.10   23.16    1.042  0.50( 0.50) 0.99    5545.8   40300.00
      4     9535.29   24.11    1.014  0.50( 0.50) 0.99    5794.0   31710.00
      5     9534.26   24.23    1.011  0.50( 0.50) 0.99    5826.2   40200.00
      6     9514.13   26.04    0.967  0.50( 0.50) 0.99    6337.1   31810.00
      7     9383.04   42.39    0.739  0.50( 0.50) 0.99   10920.0   40120.00
      8     9338.89   48.26    0.690  0.50( 0.50) 0.99   12499.3   11801.00
      9     9221.52   59.48    0.618  0.50( 0.50) 0.99   15709.8   11500.00
     10     9134.15   65.06    0.598  0.50( 0.50) 0.99   17639.3   11701.00
     11     9002.07   71.23    0.577  0.50( 0.50) 0.99   19758.5   11000.00
     12     8712.17   87.35    0.522  0.50( 0.50) 0.99   26613.2   12500.00
     13     8520.90   93.41    0.506  0.50( 0.50) 0.99   29483.7   11910.00
     14     7868.07  101.78    0.490  0.50( 0.50) 0.99   32772.5   11130.00
     15     7207.68  112.83    0.469  0.50( 0.50) 0.99   36441.0   11620.00
     16     6169.13  127.95    0.445  0.50( 0.50) 0.99   40978.6   12400.00
     17     5342.08  138.62    0.433  0.50( 0.50) 0.99   43275.3   12201.00
     18     4745.70  147.32    0.422  0.50( 0.50) 0.99   44564.5   12111.00
     19     4399.12  152.60    0.416  0.50( 0.50) 0.99   45317.1   10700.00
     20     3835.56  161.98    0.405  0.50( 0.50) 0.99   46491.5   12261.00
```



```
     21     3372.57  170.66    0.394  0.50( 0.50) 0.99   47303.2   10200.00
     22     2819.53  185.02    0.380  0.50( 0.50) 0.99   48540.6   10300.00
     23     2593.18  191.36    0.377  0.50( 0.50) 0.99   48891.7   12010.00
     24     2128.15  210.72    0.366  0.50( 0.50) 0.99   49221.0   12000.00
     25     1191.22  275.56    0.330  0.50( 0.50) 0.99   49891.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      220.21   20.90    1.109  0.50( 0.50) 0.99     394.9   40430.00
      2      216.58   21.42    1.093  0.50( 0.50) 0.99     398.7   40440.00
      3      203.76   23.10    1.044  0.50( 0.50) 0.99     409.8   40400.00
      4      203.62   23.12    1.043  0.50( 0.50) 0.99     409.8   40420.00
      5      202.03   23.33    1.037  0.50( 0.50) 0.99     410.5   40410.00
  LONGEST FLOWPATH FROM NODE  40400.00 TO NODE  12605.30 =    7428.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9767.07   19.44    1.156  0.50( 0.50) 0.99    4957.0   31700.00
      2     9765.99   20.90    1.109  0.50( 0.50) 0.99    5351.9   40430.00
      3     9761.97   21.42    1.093  0.50( 0.50) 0.99    5485.3   40440.00
      4     9756.62   22.06    1.075  0.50( 0.50) 0.99    5650.2   31800.00
      5     9746.02   23.10    1.044  0.50( 0.50) 0.99    5938.1   40400.00
      6     9745.83   23.12    1.043  0.50( 0.50) 0.99    5943.8   40420.00
      7     9745.39   23.16    1.042  0.50( 0.50) 0.99    5955.8   40300.00
      8     9742.94   23.33    1.037  0.50( 0.50) 0.99    5999.7   40410.00
      9     9728.75   24.11    1.014  0.50( 0.50) 0.99    6204.4   31710.00
     10     9726.35   24.23    1.011  0.50( 0.50) 0.99    6236.7   40200.00
     11     9689.82   26.04    0.967  0.50( 0.50) 0.99    6747.6   31810.00
     12     9473.86   42.39    0.739  0.50( 0.50) 0.99   11330.4   40120.00
     13     9411.51   48.26    0.690  0.50( 0.50) 0.99   12909.8   11801.00
     14     9267.19   59.48    0.618  0.50( 0.50) 0.99   16120.3   11500.00
     15     9172.21   65.06    0.598  0.50( 0.50) 0.99   18049.7   11701.00
     16     9032.30   71.23    0.577  0.50( 0.50) 0.99   20169.0   11000.00
     17     8721.94   87.35    0.522  0.50( 0.50) 0.99   27023.7   12500.00
     18     8524.85   93.41    0.506  0.50( 0.50) 0.99   29894.2   11910.00
     19     7869.68  101.78    0.490  0.50( 0.50) 0.99   33182.9   11130.00
     20     7209.22  112.83    0.469  0.50( 0.50) 0.99   36851.5   11620.00
     21     6170.59  127.95    0.445  0.50( 0.50) 0.99   41389.1   12400.00
     22     5343.50  138.62    0.433  0.50( 0.50) 0.99   43685.8   12201.00
     23     4747.09  147.32    0.422  0.50( 0.50) 0.99   44975.0   12111.00
     24     4400.49  152.60    0.416  0.50( 0.50) 0.99   45727.6   10700.00
     25     3836.88  161.98    0.405  0.50( 0.50) 0.99   46901.9   12261.00
     26     3373.87  170.66    0.394  0.50( 0.50) 0.99   47713.7   10200.00
     27     2820.78  185.02    0.380  0.50( 0.50) 0.99   48951.0   10300.00
     28     2594.42  191.36    0.377  0.50( 0.50) 0.99   49302.1   12010.00
     29     2129.35  210.72    0.366  0.50( 0.50) 0.99   49631.5   12000.00
     30     1192.30  275.56    0.330  0.50( 0.50) 0.99   50301.7   10100.00
    TOTAL AREA(ACRES) =     50301.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     9767.07  Tc(MIN.) =   19.437
  EFFECTIVE AREA(ACRES) =   4957.04  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    50301.7
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.60 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    302.00  DOWNSTREAM(FEET) =    295.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   738.76   CHANNEL SLOPE =  0.0095
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    9767.07
  FLOW VELOCITY(FEET/SEC.) =  16.93   FLOW DEPTH(FEET) =  13.87
  TRAVEL TIME(MIN.) =   0.73   Tc(MIN.) =   20.16
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.60 =  103401.57 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9767.07   20.16    1.130  0.50( 0.50) 0.99    4957.0   31700.00
      2     9765.99   21.63    1.087  0.50( 0.50) 0.99    5351.9   40430.00
      3     9761.97   22.14    1.072  0.50( 0.50) 0.99    5485.3   40440.00
      4     9756.62   22.78    1.053  0.50( 0.50) 0.99    5650.2   31800.00
      5     9746.02   23.82    1.023  0.50( 0.50) 0.99    5938.1   40400.00
      6     9745.83   23.85    1.022  0.50( 0.50) 0.99    5943.8   40420.00
      7     9745.39   23.89    1.021  0.50( 0.50) 0.99    5955.8   40300.00
      8     9742.94   24.06    1.016  0.50( 0.50) 0.99    5999.7   40410.00
      9     9728.75   24.84    0.993  0.50( 0.50) 0.99    6204.4   31710.00
     10     9726.35   24.96    0.989  0.50( 0.50) 0.99    6236.7   40200.00
     11     9689.82   26.77    0.952  0.50( 0.50) 0.99    6747.6   31810.00
     12     9473.86   43.12    0.733  0.50( 0.50) 0.99   11330.4   40120.00
     13     9411.51   49.00    0.684  0.50( 0.50) 0.99   12909.8   11801.00
     14     9267.19   60.21    0.614  0.50( 0.50) 0.99   16120.3   11500.00
     15     9172.21   65.80    0.595  0.50( 0.50) 0.99   18049.7   11701.00
     16     9032.30   71.97    0.574  0.50( 0.50) 0.99   20169.0   11000.00
     17     8721.94   88.10    0.519  0.50( 0.50) 0.99   27023.7   12500.00
     18     8524.85   94.17    0.505  0.50( 0.50) 0.99   29894.2   11910.00
     19     7869.68  102.55    0.489  0.50( 0.50) 0.99   33182.9   11130.00
     20     7209.22  113.62    0.467  0.50( 0.50) 0.99   36851.5   11620.00
     21     6170.59  128.77    0.444  0.50( 0.50) 0.99   41389.1   12400.00
     22     5343.50  139.46    0.432  0.50( 0.50) 0.99   43685.8   12201.00
     23     4747.09  148.19    0.421  0.50( 0.50) 0.99   44975.0   12111.00
     24     4400.49  153.48    0.415  0.50( 0.50) 0.99   45727.6   10700.00
     25     3836.88  162.90    0.404  0.50( 0.50) 0.99   46901.9   12261.00
     26     3373.87  171.61    0.393  0.50( 0.50) 0.99   47713.7   10200.00
     27     2820.78  186.01    0.380  0.50( 0.50) 0.99   48951.0   10300.00
     28     2594.42  192.37    0.376  0.50( 0.50) 0.99   49302.1   12010.00
     29     2129.35  211.78    0.366  0.50( 0.50) 0.99   49631.5   12000.00
     30     1192.30  276.80    0.330  0.50( 0.50) 0.99   50301.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    9767.07  Tc(MIN.) =   20.16
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4957.04

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
```



```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610405U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       55.77   15.36  0.50( 0.50) 1.00      76.3   40510.00
      2       54.01   17.32  0.50( 0.50) 1.00      81.4   40500.00
    TOTAL AREA(ACRES) =       81.4

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9767.07   20.16    1.130  0.50( 0.50) 0.99    4957.0   31700.00
      2     9765.99   21.63    1.087  0.50( 0.50) 0.99    5351.9   40430.00
      3     9761.97   22.14    1.072  0.50( 0.50) 0.99    5485.3   40440.00
      4     9756.62   22.78    1.053  0.50( 0.50) 0.99    5650.2   31800.00
      5     9746.02   23.82    1.023  0.50( 0.50) 0.99    5938.1   40400.00
      6     9745.83   23.85    1.022  0.50( 0.50) 0.99    5943.8   40420.00
      7     9745.39   23.89    1.021  0.50( 0.50) 0.99    5955.8   40300.00
      8     9742.94   24.06    1.016  0.50( 0.50) 0.99    5999.7   40410.00
      9     9728.75   24.84    0.993  0.50( 0.50) 0.99    6204.4   31710.00
     10     9726.35   24.96    0.989  0.50( 0.50) 0.99    6236.7   40200.00
     11     9689.82   26.77    0.952  0.50( 0.50) 0.99    6747.6   31810.00
     12     9473.86   43.12    0.733  0.50( 0.50) 0.99   11330.4   40120.00
     13     9411.51   49.00    0.684  0.50( 0.50) 0.99   12909.8   11801.00
     14     9267.19   60.21    0.614  0.50( 0.50) 0.99   16120.3   11500.00
     15     9172.21   65.80    0.595  0.50( 0.50) 0.99   18049.7   11701.00
     16     9032.30   71.97    0.574  0.50( 0.50) 0.99   20169.0   11000.00
     17     8721.94   88.10    0.519  0.50( 0.50) 0.99   27023.7   12500.00
     18     8524.85   94.17    0.505  0.50( 0.50) 0.99   29894.2   11910.00
     19     7869.68  102.55    0.489  0.50( 0.50) 0.99   33182.9   11130.00
     20     7209.22  113.62    0.467  0.50( 0.50) 0.99   36851.5   11620.00
     21     6170.59  128.77    0.444  0.50( 0.50) 0.99   41389.1   12400.00
     22     5343.50  139.46    0.432  0.50( 0.50) 0.99   43685.8   12201.00
     23     4747.09  148.19    0.421  0.50( 0.50) 0.99   44975.0   12111.00
     24     4400.49  153.48    0.415  0.50( 0.50) 0.99   45727.6   10700.00
     25     3836.88  162.90    0.404  0.50( 0.50) 0.99   46901.9   12261.00
     26     3373.87  171.61    0.393  0.50( 0.50) 0.99   47713.7   10200.00
     27     2820.78  186.01    0.380  0.50( 0.50) 0.99   48951.0   10300.00
     28     2594.42  192.37    0.376  0.50( 0.50) 0.99   49302.1   12010.00
     29     2129.35  211.78    0.366  0.50( 0.50) 0.99   49631.5   12000.00
     30     1192.30  276.80    0.330  0.50( 0.50) 0.99   50301.7   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.60 =  103401.57 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1       55.77   15.36    1.311  0.50( 0.50) 1.00      76.3   40510.00
    2       54.01   17.32    1.237  0.50( 0.50) 1.00      81.4   40500.00
LONGEST FLOWPATH FROM NODE  40500.00 TO NODE  12605.60 =    4091.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     9622.73   15.36    1.311  0.50( 0.50) 0.99    3852.7   40510.00
    2     9821.08   17.32    1.237  0.50( 0.50) 0.99    4339.5   40500.00
    3     9813.28   20.16    1.130  0.50( 0.50) 0.99    5038.4   31700.00
    4     9809.04   21.63    1.087  0.50( 0.50) 0.99    5433.3   40430.00
    5     9803.92   22.14    1.072  0.50( 0.50) 0.99    5566.7   40440.00
    6     9797.19   22.78    1.053  0.50( 0.50) 0.99    5731.6   31800.00
    7     9784.35   23.82    1.023  0.50( 0.50) 0.99    6019.5   40400.00
    8     9784.11   23.85    1.022  0.50( 0.50) 0.99    6025.2   40420.00
    9     9783.58   23.89    1.021  0.50( 0.50) 0.99    6037.1   40300.00
   10     9780.77   24.06    1.016  0.50( 0.50) 0.99    6081.1   40410.00
   11     9764.89   24.84    0.993  0.50( 0.50) 0.99    6285.8   31710.00
   12     9762.23   24.96    0.989  0.50( 0.50) 0.99    6318.1   40200.00
   13     9722.94   26.77    0.952  0.50( 0.50) 0.99    6828.9   31810.00
   14     9490.99   43.12    0.733  0.50( 0.50) 0.99   11411.8   40120.00
   15     9425.07   49.00    0.684  0.50( 0.50) 0.99   12991.1   11801.00
   16     9275.62   60.21    0.614  0.50( 0.50) 0.99   16201.7   11500.00
   17     9179.25   65.80    0.595  0.50( 0.50) 0.99   18131.1   11701.00
   18     9037.80   71.97    0.574  0.50( 0.50) 0.99   20250.3   11000.00
   19     8723.43   88.10    0.519  0.50( 0.50) 0.99   27105.0   12500.00
   20     8525.28   94.17    0.505  0.50( 0.50) 0.99   29975.6   11910.00
   21     7869.75  102.55    0.489  0.50( 0.50) 0.99   33264.3   11130.00
   22     7209.29  113.62    0.467  0.50( 0.50) 0.99   36932.9   11620.00
   23     6170.66  128.77    0.444  0.50( 0.50) 0.99   41470.4   12400.00
   24     5343.57  139.46    0.432  0.50( 0.50) 0.99   43767.2   12201.00
   25     4747.15  148.19    0.421  0.50( 0.50) 0.99   45056.3   12111.00
   26     4400.55  153.48    0.415  0.50( 0.50) 0.99   45808.9   10700.00
   27     3836.95  162.90    0.404  0.50( 0.50) 0.99   46983.3   12261.00
   28     3373.93  171.61    0.393  0.50( 0.50) 0.99   47795.1   10200.00
   29     2820.84  186.01    0.380  0.50( 0.50) 0.99   49032.4   10300.00
   30     2594.48  192.37    0.376  0.50( 0.50) 0.99   49383.5   12010.00
   31     2129.40  211.78    0.366  0.50( 0.50) 0.99   49712.8   12000.00
   32     1192.35  276.80    0.330  0.50( 0.50) 0.99   50383.1   10100.00
  TOTAL AREA(ACRES) =     50383.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     9821.08  Tc(MIN.) =   17.321
 EFFECTIVE AREA(ACRES) =   4339.52  AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    50383.1
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.60 =  103401.57 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12605.60 TO NODE  12606.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    295.00  DOWNSTREAM(FEET) =    286.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1203.43   CHANNEL SLOPE =  0.0075
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
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 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 CHANNEL FLOW THRU SUBAREA(CFS) =    9821.08
 FLOW VELOCITY(FEET/SEC.) =  15.51   FLOW DEPTH(FEET) =  14.53
 TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =   18.61
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     9622.73   16.66    1.262  0.50( 0.50) 0.99    3852.7   40510.00
    2     9821.08   18.61    1.188  0.50( 0.50) 0.99    4339.5   40500.00
    3     9813.28   21.46    1.092  0.50( 0.50) 0.99    5038.4   31700.00
    4     9809.04   22.92    1.049  0.50( 0.50) 0.99    5433.3   40430.00
    5     9803.92   23.44    1.034  0.50( 0.50) 0.99    5566.7   40440.00
    6     9797.19   24.08    1.015  0.50( 0.50) 0.99    5731.6   31800.00
    7     9784.35   25.12    0.986  0.50( 0.50) 0.99    6019.5   40400.00
    8     9784.11   25.14    0.985  0.50( 0.50) 0.99    6025.2   40420.00
    9     9783.58   25.18    0.984  0.50( 0.50) 0.99    6037.1   40300.00
   10     9780.77   25.35    0.981  0.50( 0.50) 0.99    6081.1   40410.00
   11     9764.89   26.13    0.965  0.50( 0.50) 0.99    6285.8   31710.00
   12     9762.23   26.26    0.962  0.50( 0.50) 0.99    6318.1   40200.00
   13     9722.94   28.06    0.925  0.50( 0.50) 0.99    6828.9   31810.00
   14     9490.99   44.42    0.722  0.50( 0.50) 0.99   11411.8   40120.00
   15     9425.07   50.30    0.674  0.50( 0.50) 0.99   12991.1   11801.00
   16     9275.62   61.53    0.610  0.50( 0.50) 0.99   16201.7   11500.00
   17     9179.25   67.12    0.591  0.50( 0.50) 0.99   18131.1   11701.00
   18     9037.80   73.29    0.570  0.50( 0.50) 0.99   20250.3   11000.00
   19     8723.43   89.43    0.515  0.50( 0.50) 0.99   27105.0   12500.00
   20     8525.28   95.51    0.502  0.50( 0.50) 0.99   29975.6   11910.00
   21     7869.75  103.92    0.486  0.50( 0.50) 0.99   33264.3   11130.00
   22     7209.29  115.01    0.465  0.50( 0.50) 0.99   36932.9   11620.00
   23     6170.66  130.22    0.443  0.50( 0.50) 0.99   41470.4   12400.00
   24     5343.57  140.97    0.430  0.50( 0.50) 0.99   43767.2   12201.00
   25     4747.15  149.74    0.419  0.50( 0.50) 0.99   45056.3   12111.00
   26     4400.55  155.06    0.413  0.50( 0.50) 0.99   45808.9   10700.00
   27     3836.95  164.53    0.402  0.50( 0.50) 0.99   46983.3   12261.00
   28     3373.93  173.30    0.391  0.50( 0.50) 0.99   47795.1   10200.00
   29     2820.84  187.78    0.379  0.50( 0.50) 0.99   49032.4   10300.00
   30     2594.48  194.17    0.375  0.50( 0.50) 0.99   49383.5   12010.00
   31     2129.40  213.68    0.364  0.50( 0.50) 0.99   49712.8   12000.00
   32     1192.35  278.99    0.329  0.50( 0.50) 0.99   50383.1   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    9821.08  Tc(MIN.) =   18.61
 AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4339.52

****************************************************************************
 FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610406U.DNA
```

```
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM        Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER      (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
     1       63.15   24.01  0.50( 0.50) 0.99     135.0   40600.00
   TOTAL AREA(ACRES) =      135.0

****************************************************************************
 FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1     9622.73   16.66    1.262  0.50( 0.50) 0.99    3852.7   40510.00
     2     9821.08   18.61    1.188  0.50( 0.50) 0.99    4339.5   40500.00
     3     9813.28   21.46    1.092  0.50( 0.50) 0.99    5038.4   31700.00
     4     9809.04   22.92    1.049  0.50( 0.50) 0.99    5433.3   40430.00
     5     9803.92   23.44    1.034  0.50( 0.50) 0.99    5566.7   40440.00
     6     9797.19   24.08    1.015  0.50( 0.50) 0.99    5731.6   31800.00
     7     9784.35   25.12    0.986  0.50( 0.50) 0.99    6019.5   40400.00
     8     9784.11   25.14    0.985  0.50( 0.50) 0.99    6025.2   40420.00
     9     9783.58   25.18    0.984  0.50( 0.50) 0.99    6037.1   40300.00
    10     9780.77   25.35    0.981  0.50( 0.50) 0.99    6081.1   40410.00
    11     9764.89   26.13    0.965  0.50( 0.50) 0.99    6285.8   31710.00
    12     9762.23   26.26    0.962  0.50( 0.50) 0.99    6318.1   40200.00
    13     9722.94   28.06    0.925  0.50( 0.50) 0.99    6828.9   31810.00
    14     9490.99   44.42    0.722  0.50( 0.50) 0.99   11411.8   40120.00
    15     9425.07   50.30    0.674  0.50( 0.50) 0.99   12991.1   11801.00
    16     9275.62   61.53    0.610  0.50( 0.50) 0.99   16201.7   11500.00
    17     9179.25   67.12    0.591  0.50( 0.50) 0.99   18131.1   11701.00
    18     9037.80   73.29    0.570  0.50( 0.50) 0.99   20250.3   11000.00
    19     8723.43   89.43    0.515  0.50( 0.50) 0.99   27105.0   12500.00
    20     8525.28   95.51    0.502  0.50( 0.50) 0.99   29975.6   11910.00
    21     7869.75  103.92    0.486  0.50( 0.50) 0.99   33264.3   11130.00
    22     7209.29  115.01    0.465  0.50( 0.50) 0.99   36932.9   11620.00
    23     6170.66  130.22    0.443  0.50( 0.50) 0.99   41470.4   12400.00
    24     5343.57  140.97    0.430  0.50( 0.50) 0.99   43767.2   12201.00
    25     4747.15  149.74    0.419  0.50( 0.50) 0.99   45056.3   12111.00
    26     4400.55  155.06    0.413  0.50( 0.50) 0.99   45808.9   10700.00
    27     3836.95  164.53    0.402  0.50( 0.50) 0.99   46983.3   12261.00
    28     3373.93  173.30    0.391  0.50( 0.50) 0.99   47795.1   10200.00
    29     2820.84  187.78    0.379  0.50( 0.50) 0.99   49032.4   10300.00
    30     2594.48  194.17    0.375  0.50( 0.50) 0.99   49383.5   12010.00
    31     2129.40  213.68    0.364  0.50( 0.50) 0.99   49712.8   12000.00
    32     1192.35  278.99    0.329  0.50( 0.50) 0.99   50383.1   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1       63.15   24.01    1.017  0.50( 0.50) 0.99     135.0   40600.00
 LONGEST FLOWPATH FROM NODE  40600.00 TO NODE  12606.00 =    6107.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
```



```
     1     9685.88   16.66    1.262  0.50( 0.50) 0.99    3946.4   40510.00
     2     9884.23   18.61    1.188  0.50( 0.50) 0.99    4444.2   40500.00
     3     9876.42   21.46    1.092  0.50( 0.50) 0.99    5159.1   31700.00
     4     9872.19   22.92    1.049  0.50( 0.50) 0.99    5562.2   40430.00
     5     9867.06   23.44    1.034  0.50( 0.50) 0.99    5698.5   40440.00
     6     9861.08   24.01    1.017  0.50( 0.50) 0.99    5848.2   40600.00
     7     9860.08   24.08    1.015  0.50( 0.50) 0.99    5866.6   31800.00
     8     9843.64   25.12    0.986  0.50( 0.50) 0.99    6154.5   40400.00
     9     9843.36   25.14    0.985  0.50( 0.50) 0.99    6160.2   40420.00
    10     9842.71   25.18    0.984  0.50( 0.50) 0.99    6172.1   40300.00
    11     9839.48   25.35    0.981  0.50( 0.50) 0.99    6216.1   40410.00
    12     9821.65   26.13    0.965  0.50( 0.50) 0.99    6420.8   31710.00
    13     9818.68   26.26    0.962  0.50( 0.50) 0.99    6453.1   40200.00
    14     9774.86   28.06    0.925  0.50( 0.50) 0.99    6963.9   31810.00
    15     9518.30   44.42    0.722  0.50( 0.50) 0.99   11546.8   40120.00
    16     9446.52   50.30    0.674  0.50( 0.50) 0.99   13126.1   11801.00
    17     9289.26   61.53    0.610  0.50( 0.50) 0.99   16336.6   11500.00
    18     9190.57   67.12    0.591  0.50( 0.50) 0.99   18266.1   11701.00
    19     9046.58   73.29    0.570  0.50( 0.50) 0.99   20385.3   11000.00
    20     8725.53   89.43    0.515  0.50( 0.50) 0.99   27240.0   12500.00
    21     8525.85   95.51    0.502  0.50( 0.50) 0.99   30110.5   11910.00
    22     7870.06  103.92    0.486  0.50( 0.50) 0.99   33399.3   11130.00
    23     7209.59  115.01    0.465  0.50( 0.50) 0.99   37067.9   11620.00
    24     6170.93  130.22    0.443  0.50( 0.50) 0.99   41605.4   12400.00
    25     5343.84  140.97    0.430  0.50( 0.50) 0.99   43902.1   12201.00
    26     4747.42  149.74    0.419  0.50( 0.50) 0.99   45191.3   12111.00
    27     4400.81  155.06    0.413  0.50( 0.50) 0.99   45943.9   10700.00
    28     3837.20  164.53    0.402  0.50( 0.50) 0.99   47118.3   12261.00
    29     3374.17  173.30    0.391  0.50( 0.50) 0.99   47930.0   10200.00
    30     2821.07  187.78    0.379  0.50( 0.50) 0.99   49167.4   10300.00
    31     2594.71  194.17    0.375  0.50( 0.50) 0.99   49518.5   12010.00
    32     2129.63  213.68    0.364  0.50( 0.50) 0.99   49847.8   12000.00
    33     1192.56  278.99    0.329  0.50( 0.50) 0.99   50518.0   10100.00
  TOTAL AREA(ACRES) =     50518.0

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     9884.23  Tc(MIN.) =   18.615
 EFFECTIVE AREA(ACRES) =   4444.19  AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    50518.0
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =    50518.0  TC(MIN.) =     18.61
 EFFECTIVE AREA(ACRES) =   4444.19  AREA-AVERAGED Fm(INCH/HR)=  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.993
 PEAK FLOW RATE(CFS)   =    9884.23

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1     9685.88   16.66    1.262  0.50( 0.50) 0.99    3946.4   40510.00
     2     9884.23   18.61    1.188  0.50( 0.50) 0.99    4444.2   40500.00
     3     9876.42   21.46    1.092  0.50( 0.50) 0.99    5159.1   31700.00
     4     9872.19   22.92    1.049  0.50( 0.50) 0.99    5562.2   40430.00
     5     9867.06   23.44    1.034  0.50( 0.50) 0.99    5698.5   40440.00
     6     9861.08   24.01    1.017  0.50( 0.50) 0.99    5848.2   40600.00
     7     9860.08   24.08    1.015  0.50( 0.50) 0.99    5866.6   31800.00
```

8	9843.64	25.12	0.986	0.50(0.50)	0.99	6154.5	40400.00
9	9843.36	25.14	0.985	0.50(0.50)	0.99	6160.2	40420.00
10	9842.71	25.18	0.984	0.50(0.50)	0.99	6172.1	40300.00
11	9839.48	25.35	0.981	0.50(0.50)	0.99	6216.1	40410.00
12	9821.65	26.13	0.965	0.50(0.50)	0.99	6420.8	31710.00
13	9818.68	26.26	0.962	0.50(0.50)	0.99	6453.1	40200.00
14	9774.86	28.06	0.925	0.50(0.50)	0.99	6963.9	31810.00
15	9518.30	44.42	0.722	0.50(0.50)	0.99	11546.8	40120.00
16	9446.52	50.30	0.674	0.50(0.50)	0.99	13126.1	11801.00
17	9289.26	61.53	0.610	0.50(0.50)	0.99	16336.6	11500.00
18	9190.57	67.12	0.591	0.50(0.50)	0.99	18266.1	11701.00
19	9046.58	73.29	0.570	0.50(0.50)	0.99	20385.3	11000.00
20	8725.53	89.43	0.515	0.50(0.50)	0.99	27240.0	12500.00
21	8525.85	95.51	0.502	0.50(0.50)	0.99	30110.5	11910.00
22	7870.06	103.92	0.486	0.50(0.50)	0.99	33399.3	11130.00
23	7209.59	115.01	0.465	0.50(0.50)	0.99	37067.9	11620.00
24	6170.93	130.22	0.443	0.50(0.50)	0.99	41605.4	12400.00
25	5343.84	140.97	0.430	0.50(0.50)	0.99	43902.1	12201.00
26	4747.42	149.74	0.419	0.50(0.50)	0.99	45191.3	12111.00
27	4400.81	155.06	0.413	0.50(0.50)	0.99	45943.9	10700.00
28	3837.20	164.53	0.402	0.50(0.50)	0.99	47118.3	12261.00
29	3374.17	173.30	0.391	0.50(0.50)	0.99	47930.0	10200.00
30	2821.07	187.78	0.379	0.50(0.50)	0.99	49167.4	10300.00
31	2594.71	194.17	0.375	0.50(0.50)	0.99	49518.5	12010.00
32	2129.63	213.68	0.364	0.50(0.50)	0.99	49847.8	12000.00
33	1192.56	278.99	0.329	0.50(0.50)	0.99	50518.0	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S27.DAT
  TIME/DATE OF STUDY: 08:15 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.710
   2)   10.00;  1.799
   3)   15.00;  1.319
   4)   20.00;  1.129
   5)   25.00;  0.984
   6)   30.00;  0.882
   7)   40.00;  0.756
   8)   50.00;  0.673
   9)   60.00;  0.612
  10)   90.00;  0.509
  11)  120.00;  0.451
  12)  180.00;  0.379
  13)  360.00;  0.281
  14) 1200.00;  0.123
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S26.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     9884.23   18.61  0.50( 0.50) 0.99    4444.2   40500.00
      2     9518.30   44.42  0.50( 0.50) 0.99   11546.8   40120.00
      3     9446.52   50.30  0.50( 0.50) 0.99   13126.1   11801.00
      4     9289.26   61.53  0.50( 0.50) 0.99   16336.6   11500.00
      5     9190.57   67.12  0.50( 0.50) 0.99   18266.1   11701.00
      6     9046.58   73.29  0.50( 0.50) 0.99   20385.3   11000.00
      7     8725.53   89.43  0.50( 0.50) 0.99   27240.0   12500.00
      8     8525.85   95.51  0.50( 0.50) 0.99   30110.5   11910.00
      9     7870.06  103.92  0.50( 0.50) 0.99   33399.3   11130.00
     10     7209.59  115.01  0.50( 0.50) 0.99   37067.9   11620.00
     11     6170.93  130.22  0.50( 0.50) 0.99   41605.4   12400.00
     12     5343.84  140.97  0.50( 0.50) 0.99   43902.1   12201.00
     13     4747.42  149.74  0.50( 0.50) 0.99   45191.3   12111.00
     14     4400.81  155.06  0.50( 0.50) 0.99   45943.9   10700.00
     15     3837.20  164.53  0.50( 0.50) 0.99   47118.3   12261.00
     16     3374.17  173.30  0.50( 0.50) 0.99   47930.0   10200.00
     17     2821.07  187.78  0.50( 0.50) 0.99   49167.4   10300.00
     18     2594.71  194.17  0.50( 0.50) 0.99   49518.5   12010.00
     19     2129.63  213.68  0.50( 0.50) 0.99   49847.8   12000.00
     20     1192.56  278.99  0.50( 0.50) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =    50518.0

**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     9884.23   18.61  0.50( 0.50) 0.99    4444.2   40500.00
      2     9518.30   44.42  0.50( 0.50) 0.99   11546.8   40120.00
      3     9446.52   50.30  0.50( 0.50) 0.99   13126.1   11801.00
      4     9289.26   61.53  0.50( 0.50) 0.99   16336.6   11500.00
      5     9190.57   67.12  0.50( 0.50) 0.99   18266.1   11701.00
      6     9046.58   73.29  0.50( 0.50) 0.99   20385.3   11000.00
      7     8725.53   89.43  0.50( 0.50) 0.99   27240.0   12500.00
      8     8525.85   95.51  0.50( 0.50) 0.99   30110.5   11910.00
      9     7870.06  103.92  0.50( 0.50) 0.99   33399.3   11130.00
     10     7209.59  115.01  0.50( 0.50) 0.99   37067.9   11620.00
     11     6170.93  130.22  0.50( 0.50) 0.99   41605.4   12400.00
     12     5343.84  140.97  0.50( 0.50) 0.99   43902.1   12201.00
     13     4747.42  149.74  0.50( 0.50) 0.99   45191.3   12111.00
     14     4400.81  155.06  0.50( 0.50) 0.99   45943.9   10700.00
     15     3837.20  164.53  0.50( 0.50) 0.99   47118.3   12261.00
     16     3374.17  173.30  0.50( 0.50) 0.99   47930.0   10200.00
     17     2821.07  187.78  0.50( 0.50) 0.99   49167.4   10300.00
     18     2594.71  194.17  0.50( 0.50) 0.99   49518.5   12010.00
```

```
     19     2129.63  213.68  0.50( 0.50) 0.99   49847.8   12000.00
     20     1192.56  278.99  0.50( 0.50) 0.99   50518.0   10100.00
    TOTAL AREA(ACRES) =     50518.0

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12701.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    286.00  DOWNSTREAM(FEET) =    276.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.19   CHANNEL SLOPE =  0.0079
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.131
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.55      0.50     0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9886.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.89
  AVERAGE FLOW DEPTH(FEET) =  14.40   TRAVEL TIME(MIN.) =   1.32
  Tc(MIN.) =   19.94
  SUBAREA AREA(ACRES) =     7.55       SUBAREA RUNOFF(CFS) =    4.67
  EFFECTIVE AREA(ACRES) =   4451.74     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50525.6         PEAK FLOW RATE(CFS) =    9884.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 14.40   FLOW VELOCITY(FEET/SEC.) =  15.89
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12701.00 =  105865.19 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9884.23   19.94    1.131  0.50( 0.50) 0.99    4451.7   40500.00
      2     9518.30   45.76    0.708  0.50( 0.50) 0.99   11554.3   40120.00
      3     9446.52   51.64    0.663  0.50( 0.50) 0.99   13133.7   11801.00
      4     9289.26   62.87    0.602  0.50( 0.50) 0.99   16344.2   11500.00
      5     9190.57   68.46    0.583  0.50( 0.50) 0.99   18273.6   11701.00
      6     9046.58   74.64    0.562  0.50( 0.50) 0.99   20392.9   11000.00
      7     8725.53   90.80    0.507  0.50( 0.50) 0.99   27247.6   12500.00
      8     8525.85   96.88    0.496  0.50( 0.50) 0.99   30118.1   11910.00
      9     7870.06  105.32    0.479  0.50( 0.50) 0.99   33406.8   11130.00
     10     7209.59  116.44    0.458  0.50( 0.50) 0.99   37075.4   11620.00
     11     6170.93  131.71    0.437  0.50( 0.50) 0.99   41613.0   12400.00
     12     5343.84  142.51    0.424  0.50( 0.50) 0.99   43909.7   12201.00
     13     4747.42  151.33    0.413  0.50( 0.50) 0.99   45198.9   12111.00
     14     4400.81  156.68    0.407  0.50( 0.50) 0.99   45951.5   10700.00
     15     3837.20  166.21    0.396  0.50( 0.50) 0.99   47125.8   12261.00
     16     3374.17  175.03    0.385  0.50( 0.50) 0.99   47937.6   10200.00
     17     2821.07  189.59    0.374  0.50( 0.50) 0.99   49174.9   10300.00
     18     2594.71  196.02    0.370  0.50( 0.50) 0.99   49526.0   12010.00
     19     2129.63  215.62    0.360  0.50( 0.50) 0.99   49855.4   12000.00
     20     1192.56  281.23    0.324  0.50( 0.50) 0.99   50525.6   10100.00
```



```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    9884.23  Tc(MIN.) =   19.94
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4451.74

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    276.00  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   147.65   CHANNEL SLOPE =  0.0068
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.126
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        1.49      0.50     0.972     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.972
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9884.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.97
  AVERAGE FLOW DEPTH(FEET) =  14.84   TRAVEL TIME(MIN.) =   0.16
  Tc(MIN.) =   20.10
  SUBAREA AREA(ACRES) =     1.49       SUBAREA RUNOFF(CFS) =    0.86
  EFFECTIVE AREA(ACRES) =   4453.23     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50527.1         PEAK FLOW RATE(CFS) =    9884.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 14.83   FLOW VELOCITY(FEET/SEC.) =  14.97
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9884.23   20.10    1.126  0.50( 0.50) 0.99    4453.2   40500.00
      2     9518.30   45.92    0.707  0.50( 0.50) 0.99   11555.8   40120.00
      3     9446.52   51.81    0.662  0.50( 0.50) 0.99   13135.1   11801.00
      4     9289.26   63.04    0.602  0.50( 0.50) 0.99   16345.7   11500.00
      5     9190.57   68.63    0.582  0.50( 0.50) 0.99   18275.1   11701.00
      6     9046.58   74.81    0.561  0.50( 0.50) 0.99   20394.4   11000.00
      7     8725.53   90.97    0.507  0.50( 0.50) 0.99   27249.1   12500.00
      8     8525.85   97.05    0.495  0.50( 0.50) 0.99   30119.6   11910.00
      9     7870.06  105.49    0.479  0.50( 0.50) 0.99   33408.3   11130.00
     10     7209.59  116.62    0.458  0.50( 0.50) 0.99   37076.9   11620.00
     11     6170.93  131.89    0.437  0.50( 0.50) 0.99   41614.4   12400.00
     12     5343.84  142.70    0.424  0.50( 0.50) 0.99   43911.2   12201.00
     13     4747.42  151.53    0.413  0.50( 0.50) 0.99   45200.3   12111.00
     14     4400.81  156.88    0.407  0.50( 0.50) 0.99   45953.0   10700.00
     15     3837.20  166.42    0.395  0.50( 0.50) 0.99   47127.3   12261.00
     16     3374.17  175.24    0.385  0.50( 0.50) 0.99   47939.1   10200.00
     17     2821.07  189.81    0.374  0.50( 0.50) 0.99   49176.4   10300.00
     18     2594.71  196.25    0.370  0.50( 0.50) 0.99   49527.5   12010.00
     19     2129.63  215.86    0.359  0.50( 0.50) 0.99   49856.9   12000.00
```

```
    20     1192.56  281.51    0.324  0.50( 0.50) 0.99   50527.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    9884.23  Tc(MIN.) =   20.10
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4453.23

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.10
  RAINFALL INTENSITY(INCH/HR) =   1.13
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =    4453.23
  TOTAL STREAM AREA(ACRES) =   50527.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    9884.23

****************************************************************************
  FLOW PROCESS FROM NODE  12710.00 TO NODE  12711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.56
  ELEVATION DATA: UPSTREAM(FEET) =    940.78  DOWNSTREAM(FEET) =    657.79

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.910
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.424
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.56      0.50     1.000     0   13.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.45
  TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =      5.45

****************************************************************************
  FLOW PROCESS FROM NODE  12711.00 TO NODE  12712.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.79  DOWNSTREAM(FEET) =    585.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =   766.00   CHANNEL SLOPE =  0.0942
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.257
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       26.94      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.70
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   2.71
  Tc(MIN.) =   16.62
  SUBAREA AREA(ACRES) =    26.94       SUBAREA RUNOFF(CFS) =   18.36
  EFFECTIVE AREA(ACRES) =     33.50     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.5          PEAK FLOW RATE(CFS) =      22.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOW VELOCITY(FEET/SEC.) =   5.26
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12712.00 =    1709.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12712.00 TO NODE  12713.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.63  DOWNSTREAM(FEET) =    463.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.79   CHANNEL SLOPE =  0.1188
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.148
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.73      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.97
  AVERAGE FLOW DEPTH(FEET) =   1.23   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   19.49
  SUBAREA AREA(ACRES) =    14.73       SUBAREA RUNOFF(CFS) =    8.59
  EFFECTIVE AREA(ACRES) =     48.23     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       48.2          PEAK FLOW RATE(CFS) =      28.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) =   6.02
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12713.00 =    2735.35 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12713.00 TO NODE  12714.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    463.75  DOWNSTREAM(FEET) =    360.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1148.54   CHANNEL SLOPE =  0.0901
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.057
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.64      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.39
  AVERAGE FLOW DEPTH(FEET) =   1.69   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =   22.48
  SUBAREA AREA(ACRES) =   105.64       SUBAREA RUNOFF(CFS) =   52.93
  EFFECTIVE AREA(ACRES) =    153.87     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      153.9         PEAK FLOW RATE(CFS) =      77.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.92   FLOW VELOCITY(FEET/SEC.) =   6.99
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12714.00 =    3883.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    360.30  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1314.99   CHANNEL SLOPE =  0.0649
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.968
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.13      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     103.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.64
  AVERAGE FLOW DEPTH(FEET) =   2.28   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   25.79
  SUBAREA AREA(ACRES) =   127.13       SUBAREA RUNOFF(CFS) =   53.52
  EFFECTIVE AREA(ACRES) =    281.00     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.0         PEAK FLOW RATE(CFS) =     118.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.40   FLOW VELOCITY(FEET/SEC.) =   6.85
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12720.00 =    5198.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.79
  RAINFALL INTENSITY(INCH/HR) =   0.97
```



```
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     281.00
  TOTAL STREAM AREA(ACRES) =     281.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     118.30

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9884.23   20.10    1.126  0.50( 0.50) 0.99    4453.2   40500.00
      1     9518.30   45.92    0.707  0.50( 0.50) 0.99   11555.8   40120.00
      1     9446.52   51.81    0.662  0.50( 0.50) 0.99   13135.1   11801.00
      1     9289.26   63.04    0.602  0.50( 0.50) 0.99   16345.7   11500.00
      1     9190.57   68.63    0.582  0.50( 0.50) 0.99   18275.1   11701.00
      1     9046.58   74.81    0.561  0.50( 0.50) 0.99   20394.4   11000.00
      1     8725.53   90.97    0.507  0.50( 0.50) 0.99   27249.1   12500.00
      1     8525.85   97.05    0.495  0.50( 0.50) 0.99   30119.6   11910.00
      1     7870.06  105.49    0.479  0.50( 0.50) 0.99   33408.3   11130.00
      1     7209.59  116.62    0.458  0.50( 0.50) 0.99   37076.9   11620.00
      1     6170.93  131.89    0.437  0.50( 0.50) 0.99   41614.4   12400.00
      1     5343.84  142.70    0.424  0.50( 0.50) 0.99   43911.2   12201.00
      1     4747.42  151.53    0.413  0.50( 0.50) 0.99   45200.3   12111.00
      1     4400.81  156.88    0.407  0.50( 0.50) 0.99   45953.0   10700.00
      1     3837.20  166.42    0.395  0.50( 0.50) 0.99   47127.3   12261.00
      1     3374.17  175.24    0.385  0.50( 0.50) 0.99   47939.1   10200.00
      1     2821.07  189.81    0.374  0.50( 0.50) 0.99   49176.4   10300.00
      1     2594.71  196.25    0.370  0.50( 0.50) 0.99   49527.5   12010.00
      1     2129.63  215.86    0.359  0.50( 0.50) 0.99   49856.9   12000.00
      1     1192.56  281.51    0.324  0.50( 0.50) 0.99   50527.1   10100.00
      2      118.30   25.79    0.968  0.50( 0.50) 1.00     281.0   12710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10002.53   20.10    1.126  0.50( 0.50) 0.99    4672.3   40500.00
      2     9921.97   25.79    0.968  0.50( 0.50) 0.99    6297.8   12710.00
      3     9570.55   45.92    0.707  0.50( 0.50) 0.99   11836.8   40120.00
      4     9487.44   51.81    0.662  0.50( 0.50) 0.99   13416.1   11801.00
      5     9314.90   63.04    0.602  0.50( 0.50) 0.99   16626.7   11500.00
      6     9211.35   68.63    0.582  0.50( 0.50) 0.99   18556.1   11701.00
      7     9061.99   74.81    0.561  0.50( 0.50) 0.99   20675.4   11000.00
      8     8727.29   90.97    0.507  0.50( 0.50) 0.99   27530.1   12500.00
      9     8525.85   97.05    0.495  0.50( 0.50) 0.99   30400.6   11910.00
     10     7870.06  105.49    0.479  0.50( 0.50) 0.99   33689.3   11130.00
     11     7209.59  116.62    0.458  0.50( 0.50) 0.99   37357.9   11620.00
     12     6170.93  131.89    0.437  0.50( 0.50) 0.99   41895.4   12400.00
     13     5343.84  142.70    0.424  0.50( 0.50) 0.99   44192.2   12201.00
     14     4747.42  151.53    0.413  0.50( 0.50) 0.99   45481.3   12111.00
     15     4400.81  156.88    0.407  0.50( 0.50) 0.99   46234.0   10700.00
     16     3837.20  166.42    0.395  0.50( 0.50) 0.99   47408.3   12261.00
     17     3374.17  175.24    0.385  0.50( 0.50) 0.99   48220.1   10200.00
     18     2821.07  189.81    0.374  0.50( 0.50) 0.99   49457.4   10300.00
     19     2594.71  196.25    0.370  0.50( 0.50) 0.99   49808.5   12010.00
     20     2129.63  215.86    0.359  0.50( 0.50) 0.99   50137.9   12000.00
```

```
    21     1192.56  281.51    0.324  0.50( 0.50) 0.99   50808.1   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   10002.53    Tc(MIN.) =    20.10
  EFFECTIVE AREA(ACRES) =    4672.27   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    50808.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================
  ***MEMORY BANK #  2 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610316U.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       78.69   31.05  0.50( 0.49) 0.98     231.4   31600.00
    TOTAL AREA(ACRES) =      231.4

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10002.53   20.10    1.126  0.50( 0.50) 0.99    4672.3   40500.00
      2     9921.97   25.79    0.968  0.50( 0.50) 0.99    6297.8   12710.00
      3     9570.55   45.92    0.707  0.50( 0.50) 0.99   11836.8   40120.00
      4     9487.44   51.81    0.662  0.50( 0.50) 0.99   13416.1   11801.00
      5     9314.90   63.04    0.602  0.50( 0.50) 0.99   16626.7   11500.00
      6     9211.35   68.63    0.582  0.50( 0.50) 0.99   18556.1   11701.00
      7     9061.99   74.81    0.561  0.50( 0.50) 0.99   20675.4   11000.00
      8     8727.29   90.97    0.507  0.50( 0.50) 0.99   27530.1   12500.00
      9     8525.85   97.05    0.495  0.50( 0.50) 0.99   30400.6   11910.00
     10     7870.06  105.49    0.479  0.50( 0.50) 0.99   33689.3   11130.00
     11     7209.59  116.62    0.458  0.50( 0.50) 0.99   37357.9   11620.00
     12     6170.93  131.89    0.437  0.50( 0.50) 0.99   41895.4   12400.00
     13     5343.84  142.70    0.424  0.50( 0.50) 0.99   44192.2   12201.00
     14     4747.42  151.53    0.413  0.50( 0.50) 0.99   45481.3   12111.00
     15     4400.81  156.88    0.407  0.50( 0.50) 0.99   46234.0   10700.00
     16     3837.20  166.42    0.395  0.50( 0.50) 0.99   47408.3   12261.00
     17     3374.17  175.24    0.385  0.50( 0.50) 0.99   48220.1   10200.00
     18     2821.07  189.81    0.374  0.50( 0.50) 0.99   49457.4   10300.00
     19     2594.71  196.25    0.370  0.50( 0.50) 0.99   49808.5   12010.00
     20     2129.63  215.86    0.359  0.50( 0.50) 0.99   50137.9   12000.00
     21     1192.56  281.51    0.324  0.50( 0.50) 0.99   50808.1   10100.00
```



```
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       78.69   31.05    0.869  0.50( 0.49) 0.98     231.4   31600.00
  LONGEST FLOWPATH FROM NODE  31600.00 TO NODE  12720.00 =    7759.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10081.21   20.10    1.126  0.50( 0.50) 0.99    4822.1   40500.00
      2    10000.65   25.79    0.968  0.50( 0.50) 0.99    6490.0   12710.00
      3     9908.74   31.05    0.869  0.50( 0.50) 0.99    7977.9   31600.00
      4     9615.40   45.92    0.707  0.50( 0.50) 0.99   12068.2   40120.00
      5     9522.91   51.81    0.662  0.50( 0.50) 0.99   13647.5   11801.00
      6     9337.75   63.04    0.602  0.50( 0.50) 0.99   16858.1   11500.00
      7     9230.19   68.63    0.582  0.50( 0.50) 0.99   18787.5   11701.00
      8     9076.39   74.81    0.561  0.50( 0.50) 0.99   20906.8   11000.00
      9     8730.39   90.97    0.507  0.50( 0.50) 0.99   27761.5   12500.00
     10     8527.50   97.05    0.495  0.50( 0.50) 0.99   30632.0   11910.00
     11     7871.65  105.49    0.479  0.50( 0.50) 0.99   33920.7   11130.00
     12     7211.10  116.62    0.458  0.50( 0.50) 0.99   37589.3   11620.00
     13     6172.38  131.89    0.437  0.50( 0.50) 0.99   42126.8   12400.00
     14     5345.24  142.70    0.424  0.50( 0.50) 0.99   44423.6   12201.00
     15     4748.79  151.53    0.413  0.50( 0.50) 0.99   45712.7   12111.00
     16     4402.16  156.88    0.407  0.50( 0.50) 0.99   46465.4   10700.00
     17     3838.51  166.42    0.395  0.50( 0.50) 0.99   47639.7   12261.00
     18     3375.45  175.24    0.385  0.50( 0.50) 0.99   48451.5   10200.00
     19     2822.31  189.81    0.374  0.50( 0.50) 0.99   49688.8   10300.00
     20     2595.94  196.25    0.370  0.50( 0.50) 0.99   50039.9   12010.00
     21     2130.83  215.86    0.359  0.50( 0.50) 0.99   50369.2   12000.00
     22     1193.63  281.51    0.324  0.50( 0.50) 0.99   51039.5   10100.00
    TOTAL AREA(ACRES) =     51039.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    10081.21  Tc(MIN.) =   20.101
  EFFECTIVE AREA(ACRES) =   4822.06  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51039.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    275.00  DOWNSTREAM(FEET) =    258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2669.21   CHANNEL SLOPE =  0.0064
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   10081.21
  FLOW VELOCITY(FEET/SEC.) =  14.70   FLOW DEPTH(FEET) =  15.12
  TRAVEL TIME(MIN.) =   3.03   Tc(MIN.) =   23.13
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10081.21	23.13	1.038	0.50(0.50)	0.99	4822.1	40500.00
2	10000.65	28.82	0.906	0.50(0.50)	0.99	6490.0	12710.00
3	9908.74	34.09	0.830	0.50(0.50)	0.99	7977.9	31600.00
4	9615.40	48.99	0.681	0.50(0.50)	0.99	12068.2	40120.00
5	9522.91	54.88	0.643	0.50(0.50)	0.99	13647.5	11801.00
6	9337.75	66.12	0.591	0.50(0.50)	0.99	16858.1	11500.00
7	9230.19	71.72	0.572	0.50(0.50)	0.99	18787.5	11701.00
8	9076.39	77.92	0.550	0.50(0.50)	0.99	20906.8	11000.00
9	8730.39	94.10	0.501	0.50(0.50)	0.99	27761.5	12500.00
10	8527.50	100.21	0.489	0.50(0.50)	0.99	30632.0	11910.00
11	7871.65	108.71	0.473	0.50(0.50)	0.99	33920.7	11130.00
12	7211.10	119.91	0.451	0.50(0.50)	0.99	37589.3	11620.00
13	6172.38	135.31	0.433	0.50(0.50)	0.99	42126.8	12400.00
14	5345.24	146.25	0.419	0.50(0.50)	0.99	44423.6	12201.00
15	4748.79	155.18	0.409	0.50(0.50)	0.99	45712.7	12111.00
16	4402.16	160.61	0.402	0.50(0.50)	0.99	46465.4	10700.00
17	3838.51	170.27	0.391	0.50(0.50)	0.99	47639.7	12261.00
18	3375.45	179.22	0.380	0.50(0.50)	0.99	48451.5	10200.00
19	2822.31	193.97	0.371	0.50(0.50)	0.99	49688.8	10300.00
20	2595.94	200.50	0.368	0.50(0.50)	0.99	50039.9	12010.00
21	2130.83	220.32	0.357	0.50(0.50)	0.99	50369.2	12000.00
22	1193.63	286.67	0.321	0.50(0.50)	0.99	51039.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 10081.21 Tc(MIN.) = 23.13
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4822.06

****
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610315U.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.20	28.10	0.50(0.41)	0.83	68.1	31500.00

TOTAL AREA(ACRES) = 68.1

****
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10081.21	23.13	1.038	0.50(0.50)	0.99	4822.1	40500.00
2	10000.65	28.82	0.906	0.50(0.50)	0.99	6490.0	12710.00

3	9908.74	34.09	0.830	0.50(0.50)	0.99	7977.9	31600.00
4	9615.40	48.99	0.681	0.50(0.50)	0.99	12068.2	40120.00
5	9522.91	54.88	0.643	0.50(0.50)	0.99	13647.5	11801.00
6	9337.75	66.12	0.591	0.50(0.50)	0.99	16858.1	11500.00
7	9230.19	71.72	0.572	0.50(0.50)	0.99	18787.5	11701.00
8	9076.39	77.92	0.550	0.50(0.50)	0.99	20906.8	11000.00
9	8730.39	94.10	0.501	0.50(0.50)	0.99	27761.5	12500.00
10	8527.50	100.21	0.489	0.50(0.50)	0.99	30632.0	11910.00
11	7871.65	108.71	0.473	0.50(0.50)	0.99	33920.7	11130.00
12	7211.10	119.91	0.451	0.50(0.50)	0.99	37589.3	11620.00
13	6172.38	135.31	0.433	0.50(0.50)	0.99	42126.8	12400.00
14	5345.24	146.25	0.419	0.50(0.50)	0.99	44423.6	12201.00
15	4748.79	155.18	0.409	0.50(0.50)	0.99	45712.7	12111.00
16	4402.16	160.61	0.402	0.50(0.50)	0.99	46465.4	10700.00
17	3838.51	170.27	0.391	0.50(0.50)	0.99	47639.7	12261.00
18	3375.45	179.22	0.380	0.50(0.50)	0.99	48451.5	10200.00
19	2822.31	193.97	0.371	0.50(0.50)	0.99	49688.8	10300.00
20	2595.94	200.50	0.368	0.50(0.50)	0.99	50039.9	12010.00
21	2130.83	220.32	0.357	0.50(0.50)	0.99	50369.2	12000.00
22	1193.63	286.67	0.321	0.50(0.50)	0.99	51039.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.20	28.10	0.921	0.50(0.41)	0.83	68.1	31500.00

LONGEST FLOWPATH FROM NODE 31500.00 TO NODE 12720.50 = 4043.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10112.41	23.13	1.038	0.50(0.50)	0.99	4878.1	40500.00
2	10042.07	28.10	0.921	0.50(0.50)	0.99	6346.6	31500.00
3	10030.95	28.82	0.906	0.50(0.50)	0.99	6558.1	12710.00
4	9934.38	34.09	0.830	0.50(0.50)	0.99	8046.0	31600.00
5	9631.88	48.99	0.681	0.50(0.50)	0.99	12136.3	40120.00
6	9537.04	54.88	0.643	0.50(0.50)	0.99	13715.6	11801.00
7	9348.67	66.12	0.591	0.50(0.50)	0.99	16926.2	11500.00
8	9239.92	71.72	0.572	0.50(0.50)	0.99	18855.6	11701.00
9	9084.82	77.92	0.550	0.50(0.50)	0.99	20974.8	11000.00
10	8735.79	94.10	0.501	0.50(0.50)	0.99	27829.6	12500.00
11	8532.72	100.21	0.489	0.50(0.50)	0.99	30700.1	11910.00
12	7876.70	108.71	0.473	0.50(0.50)	0.99	33988.8	11130.00
13	7215.92	119.91	0.451	0.50(0.50)	0.99	37657.4	11620.00
14	6177.00	135.31	0.433	0.50(0.50)	0.99	42194.9	12400.00
15	5349.72	146.25	0.419	0.50(0.50)	0.99	44491.7	12201.00
16	4753.15	155.18	0.409	0.50(0.50)	0.99	45780.8	12111.00
17	4406.45	160.61	0.402	0.50(0.50)	0.99	46533.4	10700.00
18	3842.68	170.27	0.391	0.50(0.50)	0.99	47707.8	12261.00
19	3379.51	179.22	0.380	0.50(0.50)	0.99	48519.6	10200.00
20	2826.28	193.97	0.371	0.50(0.50)	0.99	49756.9	10300.00
21	2599.87	200.50	0.368	0.50(0.50)	0.99	50108.0	12010.00
22	2134.64	220.32	0.357	0.50(0.50)	0.99	50437.3	12000.00
23	1197.06	286.67	0.321	0.50(0.50)	0.99	51107.6	10100.00

TOTAL AREA(ACRES) = 51107.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 10112.41 Tc(MIN.) = 23.127

EFFECTIVE AREA(ACRES) = 4878.11 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51107.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

****
FLOW PROCESS FROM NODE 12720.50 TO NODE 12721.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 258.00 DOWNSTREAM(FEET) = 256.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 438.77 CHANNEL SLOPE = 0.0046
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.022
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.15	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10127.00
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.98
AVERAGE FLOW DEPTH(FEET) = 16.12 TRAVEL TIME(MIN.) = 0.56
Tc(MIN.) = 23.69
SUBAREA AREA(ACRES) = 62.15 SUBAREA RUNOFF(CFS) = 29.19
EFFECTIVE AREA(ACRES) = 4940.26 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51169.7 PEAK FLOW RATE(CFS) = 10112.41
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 16.12 FLOW VELOCITY(FEET/SEC.) = 12.98
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12721.00 = 109120.82 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10112.41	23.69	1.022	0.50(0.50)	0.99	4940.3	40500.00
2	10042.07	28.66	0.909	0.50(0.50)	0.99	6408.8	31500.00
3	10030.95	29.38	0.895	0.50(0.50)	0.99	6620.2	12710.00
4	9934.38	34.66	0.823	0.50(0.50)	0.99	8108.2	31600.00
5	9631.88	49.56	0.677	0.50(0.50)	0.99	12198.5	40120.00
6	9537.04	55.45	0.640	0.50(0.50)	0.99	13777.8	11801.00
7	9348.67	66.70	0.589	0.50(0.50)	0.99	16988.3	11500.00
8	9239.92	72.30	0.570	0.50(0.50)	0.99	18917.8	11701.00
9	9084.82	78.50	0.548	0.50(0.50)	0.99	21037.0	11000.00
10	8735.79	94.69	0.500	0.50(0.50)	0.99	27891.7	12500.00
11	8532.72	100.79	0.488	0.50(0.50)	0.99	30762.2	11910.00
12	7876.70	109.31	0.472	0.50(0.50)	0.99	34051.0	11130.00
13	7215.92	120.52	0.450	0.50(0.50)	0.99	37719.5	11620.00
14	6177.00	135.95	0.432	0.50(0.50)	0.99	42257.1	12400.00
15	5349.72	146.91	0.419	0.50(0.50)	0.99	44553.8	12201.00
16	4753.15	155.86	0.408	0.50(0.50)	0.99	45843.0	12111.00
17	4406.45	161.30	0.401	0.50(0.50)	0.99	46595.6	10700.00
18	3842.68	170.99	0.390	0.50(0.50)	0.99	47769.9	12261.00
19	3379.51	179.96	0.379	0.50(0.50)	0.99	48581.7	10200.00

20	2826.28	194.75	0.371	0.50(0.50)	0.99	49819.1	10300.00
21	2599.87	201.29	0.367	0.50(0.50)	0.99	50170.2	12010.00
22	2134.64	221.15	0.357	0.50(0.50)	0.99	50499.5	12000.00
23	1197.06	287.63	0.320	0.50(0.50)	0.99	51169.7	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 10112.41 Tc(MIN.) = 23.69
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4940.26

****
FLOW PROCESS FROM NODE 12721.00 TO NODE 12722.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 256.00 DOWNSTREAM(FEET) = 255.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 830.42 CHANNEL SLOPE = 0.0012
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
CAPACITY(NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
ALLOWABLE DEPTH).
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.977
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.24	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10114.82
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.43
AVERAGE FLOW DEPTH(FEET) = 20.00 TRAVEL TIME(MIN.) = 1.64
Tc(MIN.) = 25.33
SUBAREA AREA(ACRES) = 11.24 SUBAREA RUNOFF(CFS) = 4.83
EFFECTIVE AREA(ACRES) = 4951.50 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51180.9 PEAK FLOW RATE(CFS) = 10112.41
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
CAPACITY(NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
ALLOWABLE DEPTH).
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 20.00 FLOW VELOCITY(FEET/SEC.) = 8.43

==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10112.41	25.33	0.977	0.50(0.50)	0.99	4951.5	40500.00
2	10042.07	30.31	0.878	0.50(0.50)	0.99	6420.0	31500.00
3	10030.95	31.04	0.869	0.50(0.50)	0.99	6631.5	12710.00
4	9934.38	36.33	0.802	0.50(0.50)	0.99	8119.4	31600.00
5	9631.88	51.28	0.665	0.50(0.50)	0.99	12209.7	40120.00
6	9537.04	57.19	0.629	0.50(0.50)	0.99	13789.0	11801.00
7	9348.67	68.47	0.583	0.50(0.50)	0.99	16999.6	11500.00
8	9239.92	74.10	0.564	0.50(0.50)	0.99	18929.0	11701.00
9	9084.82	80.30	0.542	0.50(0.50)	0.99	21048.2	11000.00
10	8735.79	96.51	0.496	0.50(0.50)	0.99	27902.9	12500.00
11	8532.72	102.63	0.485	0.50(0.50)	0.99	30773.5	11910.00
12	7876.70	111.18	0.468	0.50(0.50)	0.99	34062.2	11130.00
13	7215.92	122.43	0.448	0.50(0.50)	0.99	37730.8	11620.00
14	6177.00	137.94	0.429	0.50(0.50)	0.99	42268.3	12400.00
15	5349.72	148.97	0.416	0.50(0.50)	0.99	44565.1	12201.00
16	4753.15	157.98	0.405	0.50(0.50)	0.99	45854.2	12111.00
17	4406.45	163.46	0.399	0.50(0.50)	0.99	46606.8	10700.00
18	3842.68	173.22	0.387	0.50(0.50)	0.99	47781.2	12261.00
19	3379.51	182.27	0.378	0.50(0.50)	0.99	48593.0	10200.00
20	2826.28	197.16	0.370	0.50(0.50)	0.99	49830.3	10300.00
21	2599.87	203.76	0.366	0.50(0.50)	0.99	50181.4	12010.00
22	2134.64	223.74	0.355	0.50(0.50)	0.99	50510.7	12000.00
23	1197.06	290.62	0.319	0.50(0.50)	0.99	51180.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 10112.41 Tc(MIN.) = 25.33
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4951.50

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========

PEAK FLOWRATE TABLE FILE NAME: 0610314U.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	113.88	47.35	0.50(0.50)	0.99	497.2	31400.00

TOTAL AREA(ACRES) = 497.2

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10112.41	25.33	0.977	0.50(0.50)	0.99	4951.5	40500.00
2	10042.07	30.31	0.878	0.50(0.50)	0.99	6420.0	31500.00
3	10030.95	31.04	0.869	0.50(0.50)	0.99	6631.5	12710.00
4	9934.38	36.33	0.802	0.50(0.50)	0.99	8119.4	31600.00
5	9631.88	51.28	0.665	0.50(0.50)	0.99	12209.7	40120.00
6	9537.04	57.19	0.629	0.50(0.50)	0.99	13789.0	11801.00
7	9348.67	68.47	0.583	0.50(0.50)	0.99	16999.6	11500.00

8	9239.92	74.10	0.564	0.50(0.50)	0.99	18929.0	11701.00
9	9084.82	80.30	0.542	0.50(0.50)	0.99	21048.2	11000.00
10	8735.79	96.51	0.496	0.50(0.50)	0.99	27902.9	12500.00
11	8532.72	102.63	0.485	0.50(0.50)	0.99	30773.5	11910.00
12	7876.70	111.18	0.468	0.50(0.50)	0.99	34062.2	11130.00
13	7215.92	122.43	0.448	0.50(0.50)	0.99	37730.8	11620.00
14	6177.00	137.94	0.429	0.50(0.50)	0.99	42268.3	12400.00
15	5349.72	148.97	0.416	0.50(0.50)	0.99	44565.1	12201.00
16	4753.15	157.98	0.405	0.50(0.50)	0.99	45854.2	12111.00
17	4406.45	163.46	0.399	0.50(0.50)	0.99	46606.8	10700.00
18	3842.68	173.22	0.387	0.50(0.50)	0.99	47781.2	12261.00
19	3379.51	182.27	0.378	0.50(0.50)	0.99	48593.0	10200.00
20	2826.28	197.16	0.370	0.50(0.50)	0.99	49830.3	10300.00
21	2599.87	203.76	0.366	0.50(0.50)	0.99	50181.4	12010.00
22	2134.64	223.74	0.355	0.50(0.50)	0.99	50510.7	12000.00
23	1197.06	290.62	0.319	0.50(0.50)	0.99	51180.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	113.88	47.35	0.695	0.50(0.50)	0.99	497.2	31400.00

LONGEST FLOWPATH FROM NODE 31400.00 TO NODE 12722.00 = 14614.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10226.29	25.33	0.977	0.50(0.50)	0.99	5217.5	40500.00
2	10155.95	30.31	0.878	0.50(0.50)	0.99	6738.3	31500.00
3	10144.83	31.04	0.869	0.50(0.50)	0.99	6957.4	12710.00
4	10048.27	36.33	0.802	0.50(0.50)	0.99	8500.9	31600.00
5	9825.33	47.35	0.695	0.50(0.50)	0.99	11631.0	31400.00
6	9728.75	51.28	0.665	0.50(0.50)	0.99	12706.9	40120.00
7	9613.37	57.19	0.629	0.50(0.50)	0.99	14286.2	11801.00
8	9398.62	68.47	0.583	0.50(0.50)	0.99	17496.8	11500.00
9	9278.87	74.10	0.564	0.50(0.50)	0.99	19426.2	11701.00
10	9111.62	80.30	0.542	0.50(0.50)	0.99	21545.4	11000.00
11	8738.55	96.51	0.496	0.50(0.50)	0.99	28400.1	12500.00
12	8535.42	102.63	0.485	0.50(0.50)	0.99	31270.7	11910.00
13	7879.31	111.18	0.468	0.50(0.50)	0.99	34559.4	11130.00
14	7218.42	122.43	0.448	0.50(0.50)	0.99	38228.0	11620.00
15	6179.40	137.94	0.429	0.50(0.50)	0.99	42765.5	12400.00
16	5352.04	148.97	0.416	0.50(0.50)	0.99	45062.3	12201.00
17	4755.41	157.98	0.405	0.50(0.50)	0.99	46351.4	12111.00
18	4408.68	163.46	0.399	0.50(0.50)	0.99	47104.0	10700.00
19	3844.84	173.22	0.387	0.50(0.50)	0.99	48278.4	12261.00
20	3381.61	182.27	0.378	0.50(0.50)	0.99	49090.2	10200.00
21	2828.34	197.16	0.370	0.50(0.50)	0.99	50327.5	10300.00
22	2601.91	203.76	0.366	0.50(0.50)	0.99	50678.6	12010.00
23	2136.62	223.74	0.355	0.50(0.50)	0.99	51007.9	12000.00
24	1198.84	290.62	0.319	0.50(0.50)	0.99	51678.1	10100.00

TOTAL AREA(ACRES) = 51678.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 10226.29 Tc(MIN.) = 25.332
EFFECTIVE AREA(ACRES) = 5217.51 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51678.1

```
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12722.00 =  109951.24 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    255.00  DOWNSTREAM(FEET) =    252.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =   624.00   CHANNEL SLOPE =  0.0046
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.961
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       62.42      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   10239.24
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.11
 AVERAGE FLOW DEPTH(FEET) =  16.13   TRAVEL TIME(MIN.) =   0.79
 Tc(MIN.) =   26.12
 SUBAREA AREA(ACRES) =    62.42       SUBAREA RUNOFF(CFS) =   25.89
 EFFECTIVE AREA(ACRES) =   5279.93     AREA-AVERAGED Fm(INCH/HR) =   0.50
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =    51740.6         PEAK FLOW RATE(CFS) =   10226.29
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 16.13   FLOW VELOCITY(FEET/SEC.) =  13.11
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12740.00 =  110575.24 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    10226.29   26.12    0.961  0.50( 0.50) 0.99    5279.9   40500.00
     2    10155.95   31.11    0.868  0.50( 0.50) 0.99    6800.8   31500.00
     3    10144.83   31.83    0.859  0.50( 0.50) 0.99    7019.8   12710.00
     4    10048.27   37.13    0.792  0.50( 0.50) 0.99    8563.3   31600.00
     5     9825.33   48.15    0.688  0.50( 0.50) 0.99   11693.4   31400.00
     6     9728.75   52.08    0.660  0.50( 0.50) 0.99   12769.3   40120.00
     7     9613.37   57.99    0.624  0.50( 0.50) 0.99   14348.6   11801.00
     8     9398.62   69.28    0.580  0.50( 0.50) 0.99   17559.2   11500.00
     9     9278.87   74.91    0.561  0.50( 0.50) 0.99   19488.6   11701.00
    10     9111.62   81.12    0.540  0.50( 0.50) 0.99   21607.9   11000.00
    11     8738.55   97.34    0.495  0.50( 0.50) 0.99   28462.6   12500.00
    12     8535.42  103.46    0.483  0.50( 0.50) 0.99   31333.1   11910.00
    13     7879.31  112.03    0.466  0.50( 0.50) 0.99   34621.8   11130.00
    14     7218.42  123.30    0.447  0.50( 0.50) 0.99   38290.4   11620.00
    15     6179.40  138.84    0.428  0.50( 0.50) 0.99   42827.9   12400.00
    16     5352.04  149.90    0.415  0.50( 0.50) 0.99   45124.7   12201.00
    17     4755.41  158.94    0.404  0.50( 0.50) 0.99   46413.8   12111.00
    18     4408.68  164.44    0.398  0.50( 0.50) 0.99   47166.5   10700.00
    19     3844.84  174.24    0.386  0.50( 0.50) 0.99   48340.8   12261.00
    20     3381.61  183.32    0.377  0.50( 0.50) 0.99   49152.6   10200.00
    21     2828.34  198.26    0.369  0.50( 0.50) 0.99   50389.9   10300.00
    22     2601.91  204.87    0.365  0.50( 0.50) 0.99   50741.0   12010.00
```



```
    23     2136.62  224.91    0.355  0.50( 0.50) 0.99   51070.4   12000.00
    24     1198.84  291.98    0.318  0.50( 0.50) 0.99   51740.6   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =   10226.29  Tc(MIN.) =   26.12
 AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    5279.93

****************************************************************************
 FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   26.12
 RAINFALL INTENSITY(INCH/HR) =   0.96
 AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  0.99
 EFFECTIVE STREAM AREA(ACRES) =    5279.93
 TOTAL STREAM AREA(ACRES) =   51740.56
 PEAK FLOW RATE(CFS) AT CONFLUENCE =   10226.29

****************************************************************************
 FLOW PROCESS FROM NODE  12730.00 TO NODE  12731.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   561.54
 ELEVATION DATA: UPSTREAM(FEET) =    613.29  DOWNSTREAM(FEET) =    551.75

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.823
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.432
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,BROADLEAF"      -        6.33      0.50     1.000     0   13.82
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      5.31
 TOTAL AREA(ACRES) =      6.33   PEAK FLOW RATE(CFS) =      5.31

****************************************************************************
 FLOW PROCESS FROM NODE  12731.00 TO NODE  12732.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    551.75  DOWNSTREAM(FEET) =    494.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =   971.91   CHANNEL SLOPE =  0.0590
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.212
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       34.62      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.06
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   3.99
  Tc(MIN.) =   17.82
  SUBAREA AREA(ACRES) =    34.62       SUBAREA RUNOFF(CFS) =   22.18
  EFFECTIVE AREA(ACRES) =     40.95     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.9         PEAK FLOW RATE(CFS) =      26.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.39   FLOW VELOCITY(FEET/SEC.) =   4.55
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12732.00 =    1533.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12732.00 TO NODE  12733.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    494.40  DOWNSTREAM(FEET) =    431.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1156.41   CHANNEL SLOPE =  0.0548
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.080
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       59.52      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.98
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   3.87
  Tc(MIN.) =   21.69
  SUBAREA AREA(ACRES) =    59.52       SUBAREA RUNOFF(CFS) =   31.06
  EFFECTIVE AREA(ACRES) =    100.47     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.5         PEAK FLOW RATE(CFS) =      52.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.82   FLOW VELOCITY(FEET/SEC.) =   5.27
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12733.00 =    2689.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12733.00 TO NODE  12734.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    431.00  DOWNSTREAM(FEET) =    367.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1654.48   CHANNEL SLOPE =  0.0386
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.936
```



```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       64.05      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.87
  AVERAGE FLOW DEPTH(FEET) =   2.11   TRAVEL TIME(MIN.) =   5.66
  Tc(MIN.) =   27.35
  SUBAREA AREA(ACRES) =    64.05       SUBAREA RUNOFF(CFS) =   25.12
  EFFECTIVE AREA(ACRES) =    164.52     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      164.5         PEAK FLOW RATE(CFS) =      64.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.10   FLOW VELOCITY(FEET/SEC.) =   4.86
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12734.00 =    4344.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    367.11  DOWNSTREAM(FEET) =    252.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.98   CHANNEL SLOPE =  0.0611
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.848
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       26.02      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      68.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.87
  AVERAGE FLOW DEPTH(FEET) =   1.97   TRAVEL TIME(MIN.) =   5.34
  Tc(MIN.) =   32.69
  SUBAREA AREA(ACRES) =    26.02       SUBAREA RUNOFF(CFS) =    8.15
  EFFECTIVE AREA(ACRES) =    190.54     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      190.5         PEAK FLOW RATE(CFS) =      64.52
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   5.79
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12740.00 =    6225.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

TIME OF CONCENTRATION(MIN.) = 32.69
RAINFALL INTENSITY(INCH/HR) = 0.85
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 190.54
TOTAL STREAM AREA(ACRES) = 190.54
PEAK FLOW RATE(CFS) AT CONFLUENCE = 64.52

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10226.29	26.12	0.961	0.50(0.50)	0.99	5279.9	40500.00
1	10155.95	31.11	0.868	0.50(0.50)	0.99	6800.8	31500.00
1	10144.83	31.83	0.859	0.50(0.50)	0.99	7019.8	12710.00
1	10048.27	37.13	0.792	0.50(0.50)	0.99	8563.3	31600.00
1	9825.33	48.15	0.688	0.50(0.50)	0.99	11693.4	31400.00
1	9728.75	52.08	0.660	0.50(0.50)	0.99	12769.3	40120.00
1	9613.37	57.99	0.624	0.50(0.50)	0.99	14348.6	11801.00
1	9398.62	69.28	0.580	0.50(0.50)	0.99	17559.2	11500.00
1	9278.87	74.91	0.561	0.50(0.50)	0.99	19488.6	11701.00
1	9111.62	81.12	0.540	0.50(0.50)	0.99	21607.9	11000.00
1	8738.55	97.34	0.495	0.50(0.50)	0.99	28462.6	12500.00
1	8535.42	103.46	0.483	0.50(0.50)	0.99	31333.1	11910.00
1	7879.31	112.03	0.466	0.50(0.50)	0.99	34621.8	11130.00
1	7218.42	123.30	0.447	0.50(0.50)	0.99	38290.4	11620.00
1	6179.40	138.84	0.428	0.50(0.50)	0.99	42827.9	12400.00
1	5352.04	149.90	0.415	0.50(0.50)	0.99	45124.7	12201.00
1	4755.41	158.94	0.404	0.50(0.50)	0.99	46413.8	12111.00
1	4408.68	164.44	0.398	0.50(0.50)	0.99	47166.5	10700.00
1	3844.84	174.24	0.386	0.50(0.50)	0.99	48340.8	12261.00
1	3381.61	183.32	0.377	0.50(0.50)	0.99	49152.6	10200.00
1	2828.34	198.26	0.369	0.50(0.50)	0.99	50389.9	10300.00
1	2601.91	204.87	0.365	0.50(0.50)	0.99	50741.0	12010.00
1	2136.62	224.91	0.355	0.50(0.50)	0.99	51070.4	12000.00
1	1198.84	291.98	0.318	0.50(0.50)	0.99	51740.6	10100.00
2	64.52	32.69	0.848	0.50(0.50)	1.00	190.5	12730.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10290.81	26.12	0.961	0.50(0.50)	0.99	5432.2	40500.00
2	10220.47	31.11	0.868	0.50(0.50)	0.99	6982.1	31500.00
3	10209.35	31.83	0.859	0.50(0.50)	0.99	7205.3	12710.00
4	10193.64	32.69	0.848	0.50(0.50)	0.99	7461.4	12730.00
5	10102.43	37.13	0.792	0.50(0.50)	0.99	8753.9	31600.00
6	9860.23	48.15	0.688	0.50(0.50)	0.99	11884.0	31400.00
7	9758.44	52.08	0.660	0.50(0.50)	0.99	12959.9	40120.00
8	9636.38	57.99	0.624	0.50(0.50)	0.99	14539.2	11801.00
9	9413.45	69.28	0.580	0.50(0.50)	0.99	17749.7	11500.00
10	9290.11	74.91	0.561	0.50(0.50)	0.99	19679.1	11701.00
11	9118.91	81.12	0.540	0.50(0.50)	0.99	21798.4	11000.00
12	8738.55	97.34	0.495	0.50(0.50)	0.99	28653.1	12500.00
13	8535.42	103.46	0.483	0.50(0.50)	0.99	31523.6	11910.00
14	7879.31	112.03	0.466	0.50(0.50)	0.99	34812.4	11130.00

15	7218.42	123.30	0.447	0.50(0.50)	0.99	38480.9	11620.00
16	6179.40	138.84	0.428	0.50(0.50)	0.99	43018.5	12400.00
17	5352.04	149.90	0.415	0.50(0.50)	0.99	45315.2	12201.00
18	4755.41	158.94	0.404	0.50(0.50)	0.99	46604.4	12111.00
19	4408.68	164.44	0.398	0.50(0.50)	0.99	47357.0	10700.00
20	3844.84	174.24	0.386	0.50(0.50)	0.99	48531.3	12261.00
21	3381.61	183.32	0.377	0.50(0.50)	0.99	49343.1	10200.00
22	2828.34	198.26	0.369	0.50(0.50)	0.99	50580.5	10300.00
23	2601.91	204.87	0.365	0.50(0.50)	0.99	50931.6	12010.00
24	2136.62	224.91	0.355	0.50(0.50)	0.99	51260.9	12000.00
25	1198.84	291.98	0.318	0.50(0.50)	0.99	51931.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 10290.81 Tc(MIN.) = 26.12
EFFECTIVE AREA(ACRES) = 5432.19 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51931.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

****
FLOW PROCESS FROM NODE 12740.00 TO NODE 12741.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 252.10 DOWNSTREAM(FEET) = 247.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 401.47 CHANNEL SLOPE = 0.0127
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 10290.81
FLOW VELOCITY(FEET/SEC.) = 19.14 FLOW DEPTH(FEET) = 13.39
TRAVEL TIME(MIN.) = 0.35 Tc(MIN.) = 26.47
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10290.81	26.47	0.954	0.50(0.50)	0.99	5432.2	40500.00
2	10220.47	31.46	0.864	0.50(0.50)	0.99	6982.1	31500.00
3	10209.35	32.18	0.855	0.50(0.50)	0.99	7205.3	12710.00
4	10193.64	33.04	0.844	0.50(0.50)	0.99	7461.4	12730.00
5	10102.43	37.48	0.788	0.50(0.50)	0.99	8753.9	31600.00
6	9860.23	48.50	0.685	0.50(0.50)	0.99	11884.0	31400.00
7	9758.44	52.44	0.658	0.50(0.50)	0.99	12959.9	40120.00
8	9636.38	58.35	0.622	0.50(0.50)	0.99	14539.2	11801.00
9	9413.45	69.64	0.579	0.50(0.50)	0.99	17749.7	11500.00
10	9290.11	75.27	0.560	0.50(0.50)	0.99	19679.1	11701.00
11	9118.91	81.48	0.538	0.50(0.50)	0.99	21798.4	11000.00
12	8738.55	97.70	0.494	0.50(0.50)	0.99	28653.1	12500.00
13	8535.42	103.82	0.482	0.50(0.50)	0.99	31523.6	11910.00
14	7879.31	112.40	0.466	0.50(0.50)	0.99	34812.4	11130.00
15	7218.42	123.68	0.447	0.50(0.50)	0.99	38480.9	11620.00
16	6179.40	139.23	0.428	0.50(0.50)	0.99	43018.5	12400.00
17	5352.04	150.31	0.415	0.50(0.50)	0.99	45315.2	12201.00
18	4755.41	159.37	0.404	0.50(0.50)	0.99	46604.4	12111.00
19	4408.68	164.87	0.397	0.50(0.50)	0.99	47357.0	10700.00
20	3844.84	174.68	0.385	0.50(0.50)	0.99	48531.3	12261.00
21	3381.61	183.78	0.377	0.50(0.50)	0.99	49343.1	10200.00

```
    22     2828.34  198.74    0.369  0.50( 0.50) 0.99   50580.5   10300.00
    23     2601.91  205.37    0.365  0.50( 0.50) 0.99   50931.6   12010.00
    24     2136.62  225.43    0.354  0.50( 0.50) 0.99   51260.9   12000.00
    25     1198.84  292.58    0.318  0.50( 0.50) 0.99   51931.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   10290.81  Tc(MIN.) =   26.47
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    5432.19

****************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610313U.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       54.25   27.08  0.50( 0.49) 0.97     132.0   31300.00
    TOTAL AREA(ACRES) =      132.0

****************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10290.81   26.47    0.954  0.50( 0.50) 0.99    5432.2   40500.00
      2    10220.47   31.46    0.864  0.50( 0.50) 0.99    6982.1   31500.00
      3    10209.35   32.18    0.855  0.50( 0.50) 0.99    7205.3   12710.00
      4    10193.64   33.04    0.844  0.50( 0.50) 0.99    7461.4   12730.00
      5    10102.43   37.48    0.788  0.50( 0.50) 0.99    8753.9   31600.00
      6     9860.23   48.50    0.685  0.50( 0.50) 0.99   11884.0   31400.00
      7     9758.44   52.44    0.658  0.50( 0.50) 0.99   12959.9   40120.00
      8     9636.38   58.35    0.622  0.50( 0.50) 0.99   14539.2   11801.00
      9     9413.45   69.64    0.579  0.50( 0.50) 0.99   17749.7   11500.00
     10     9290.11   75.27    0.560  0.50( 0.50) 0.99   19679.1   11701.00
     11     9118.91   81.48    0.538  0.50( 0.50) 0.99   21798.4   11000.00
     12     8738.55   97.70    0.494  0.50( 0.50) 0.99   28653.1   12500.00
     13     8535.42  103.82    0.482  0.50( 0.50) 0.99   31523.6   11910.00
     14     7879.31  112.40    0.466  0.50( 0.50) 0.99   34812.4   11130.00
     15     7218.42  123.68    0.447  0.50( 0.50) 0.99   38480.9   11620.00
     16     6179.40  139.23    0.428  0.50( 0.50) 0.99   43018.5   12400.00
     17     5352.04  150.31    0.415  0.50( 0.50) 0.99   45315.2   12201.00
     18     4755.41  159.37    0.404  0.50( 0.50) 0.99   46604.4   12111.00
     19     4408.68  164.87    0.397  0.50( 0.50) 0.99   47357.0   10700.00
     20     3844.84  174.68    0.385  0.50( 0.50) 0.99   48531.3   12261.00
     21     3381.61  183.78    0.377  0.50( 0.50) 0.99   49343.1   10200.00
     22     2828.34  198.74    0.369  0.50( 0.50) 0.99   50580.5   10300.00
```



```
    23     2601.91  205.37    0.365  0.50( 0.50) 0.99   50931.6   12010.00
    24     2136.62  225.43    0.354  0.50( 0.50) 0.99   51260.9   12000.00
    25     1198.84  292.58    0.318  0.50( 0.50) 0.99   51931.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       54.25   27.08    0.942  0.50( 0.49) 0.97     132.0   31300.00
  LONGEST FLOWPATH FROM NODE  31300.00 TO NODE  12741.00 =    5775.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10345.07   26.47    0.954  0.50( 0.50) 0.99    5561.2   40500.00
      2    10336.48   27.08    0.942  0.50( 0.50) 0.99    5753.4   31300.00
      3    10265.44   31.46    0.864  0.50( 0.50) 0.99    7114.0   31500.00
      4    10253.24   32.18    0.855  0.50( 0.50) 0.99    7337.3   12710.00
      5    10236.23   33.04    0.844  0.50( 0.50) 0.99    7593.4   12730.00
      6    10138.36   37.48    0.788  0.50( 0.50) 0.99    8885.8   31600.00
      7     9883.96   48.50    0.685  0.50( 0.50) 0.99   12015.9   31400.00
      8     9778.92   52.44    0.658  0.50( 0.50) 0.99   13091.8   40120.00
      9     9652.56   58.35    0.622  0.50( 0.50) 0.99   14671.2   11801.00
     10     9424.49   69.64    0.579  0.50( 0.50) 0.99   17881.7   11500.00
     11     9298.84   75.27    0.560  0.50( 0.50) 0.99   19811.1   11701.00
     12     9125.11   81.48    0.538  0.50( 0.50) 0.99   21930.4   11000.00
     13     8740.19   97.70    0.494  0.50( 0.50) 0.99   28785.1   12500.00
     14     8537.02  103.82    0.482  0.50( 0.50) 0.99   31655.6   11910.00
     15     7880.85  112.40    0.466  0.50( 0.50) 0.99   34944.3   11130.00
     16     7219.90  123.68    0.447  0.50( 0.50) 0.99   38612.9   11620.00
     17     6180.81  139.23    0.428  0.50( 0.50) 0.99   43150.5   12400.00
     18     5353.42  150.31    0.415  0.50( 0.50) 0.99   45447.2   12201.00
     19     4756.75  159.37    0.404  0.50( 0.50) 0.99   46736.3   12111.00
     20     4409.99  164.87    0.397  0.50( 0.50) 0.99   47489.0   10700.00
     21     3846.12  174.68    0.385  0.50( 0.50) 0.99   48663.3   12261.00
     22     3382.86  183.78    0.377  0.50( 0.50) 0.99   49475.1   10200.00
     23     2829.56  198.74    0.369  0.50( 0.50) 0.99   50712.4   10300.00
     24     2603.12  205.37    0.365  0.50( 0.50) 0.99   51063.5   12010.00
     25     2137.79  225.43    0.354  0.50( 0.50) 0.99   51392.9   12000.00
     26     1199.89  292.58    0.318  0.50( 0.50) 0.99   52063.1   10100.00
    TOTAL AREA(ACRES) =     52063.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    10345.07  Tc(MIN.) =   26.475
  EFFECTIVE AREA(ACRES) =   5561.20  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    52063.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12800.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    247.00  DOWNSTREAM(FEET) =    240.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   819.00   CHANNEL SLOPE =  0.0085
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.937
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 17.31 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10348.47
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.53
AVERAGE FLOW DEPTH(FEET) = 14.45 TRAVEL TIME(MIN.) = 0.83
Tc(MIN.) = 27.30
SUBAREA AREA(ACRES) = 17.31 SUBAREA RUNOFF(CFS) = 6.81
EFFECTIVE AREA(ACRES) = 5578.51 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 52080.4 PEAK FLOW RATE(CFS) = 10345.07
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 14.45 FLOW VELOCITY(FEET/SEC.) = 16.52
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10345.07	27.30	0.937	0.50(0.50)	0.99	5578.5	40500.00
2	10336.48	27.91	0.925	0.50(0.50)	0.99	5770.7	31300.00
3	10265.44	32.29	0.853	0.50(0.50)	0.99	7131.3	31500.00
4	10253.24	33.01	0.844	0.50(0.50)	0.99	7354.6	12710.00
5	10236.23	33.87	0.833	0.50(0.50)	0.99	7610.7	12730.00
6	10138.36	38.31	0.777	0.50(0.50)	0.99	8903.2	31600.00
7	9883.96	49.34	0.678	0.50(0.50)	0.99	12033.2	31400.00
8	9778.92	53.28	0.653	0.50(0.50)	0.99	13109.1	40120.00
9	9652.56	59.19	0.617	0.50(0.50)	0.99	14688.5	11801.00
10	9424.49	70.48	0.576	0.50(0.50)	0.99	17899.0	11500.00
11	9298.84	76.12	0.557	0.50(0.50)	0.99	19828.4	11701.00
12	9125.11	82.33	0.535	0.50(0.50)	0.99	21947.7	11000.00
13	8740.19	98.56	0.492	0.50(0.50)	0.99	28802.4	12500.00
14	8537.02	104.69	0.481	0.50(0.50)	0.99	31672.9	11910.00
15	7880.85	113.28	0.464	0.50(0.50)	0.99	34961.6	11130.00
16	7219.90	124.59	0.445	0.50(0.50)	0.99	38630.2	11620.00
17	6180.81	140.17	0.427	0.50(0.50)	0.99	43167.8	12400.00
18	5353.42	151.29	0.413	0.50(0.50)	0.99	45464.5	12201.00
19	4756.75	160.37	0.403	0.50(0.50)	0.99	46753.7	12111.00
20	4409.99	165.90	0.396	0.50(0.50)	0.99	47506.3	10700.00
21	3846.12	175.74	0.384	0.50(0.50)	0.99	48680.6	12261.00
22	3382.86	184.87	0.376	0.50(0.50)	0.99	49492.4	10200.00
23	2829.56	199.88	0.368	0.50(0.50)	0.99	50729.8	10300.00
24	2603.12	206.53	0.365	0.50(0.50)	0.99	51080.9	12010.00
25	2137.79	226.66	0.354	0.50(0.50)	0.99	51410.2	12000.00
26	1199.89	293.99	0.317	0.50(0.50)	0.99	52080.4	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 10345.07 Tc(MIN.) = 27.30
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 5578.51
==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 52080.4 TC(MIN.) = 27.30

EFFECTIVE AREA(ACRES) = 5578.51 AREA-AVERAGED Fm(INCH/HR)= 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.991
PEAK FLOW RATE(CFS) = 10345.07

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10345.07	27.30	0.937	0.50(0.50)	0.99	5578.5	40500.00
2	10336.48	27.91	0.925	0.50(0.50)	0.99	5770.7	31300.00
3	10265.44	32.29	0.853	0.50(0.50)	0.99	7131.3	31500.00
4	10253.24	33.01	0.844	0.50(0.50)	0.99	7354.6	12710.00
5	10236.23	33.87	0.833	0.50(0.50)	0.99	7610.7	12730.00
6	10138.36	38.31	0.777	0.50(0.50)	0.99	8903.2	31600.00
7	9883.96	49.34	0.678	0.50(0.50)	0.99	12033.2	31400.00
8	9778.92	53.28	0.653	0.50(0.50)	0.99	13109.1	40120.00
9	9652.56	59.19	0.617	0.50(0.50)	0.99	14688.5	11801.00
10	9424.49	70.48	0.576	0.50(0.50)	0.99	17899.0	11500.00
11	9298.84	76.12	0.557	0.50(0.50)	0.99	19828.4	11701.00
12	9125.11	82.33	0.535	0.50(0.50)	0.99	21947.7	11000.00
13	8740.19	98.56	0.492	0.50(0.50)	0.99	28802.4	12500.00
14	8537.02	104.69	0.481	0.50(0.50)	0.99	31672.9	11910.00
15	7880.85	113.28	0.464	0.50(0.50)	0.99	34961.6	11130.00
16	7219.90	124.59	0.445	0.50(0.50)	0.99	38630.2	11620.00
17	6180.81	140.17	0.427	0.50(0.50)	0.99	43167.8	12400.00
18	5353.42	151.29	0.413	0.50(0.50)	0.99	45464.5	12201.00
19	4756.75	160.37	0.403	0.50(0.50)	0.99	46753.7	12111.00
20	4409.99	165.90	0.396	0.50(0.50)	0.99	47506.3	10700.00
21	3846.12	175.74	0.384	0.50(0.50)	0.99	48680.6	12261.00
22	3382.86	184.87	0.376	0.50(0.50)	0.99	49492.4	10200.00
23	2829.56	199.88	0.368	0.50(0.50)	0.99	50729.8	10300.00
24	2603.12	206.53	0.365	0.50(0.50)	0.99	51080.9	12010.00
25	2137.79	226.66	0.354	0.50(0.50)	0.99	51410.2	12000.00
26	1199.89	293.99	0.317	0.50(0.50)	0.99	52080.4	10100.00

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:
```

FILE NAME: S28.DAT
TIME/DATE OF STUDY: 08:16 09/12/2017

==========

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
USER-DEFINED TABLED RAINFALL USED
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	2.712
2)	10.00;	1.799
3)	15.00;	1.319
4)	20.00;	1.129
5)	25.00;	0.984
6)	30.00;	0.882
7)	40.00;	0.756
8)	50.00;	0.673
9)	60.00;	0.612
10)	90.00;	0.509
11)	120.00;	0.451
12)	180.00;	0.379
13)	360.00;	0.281
14)	1200.00;	0.123

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<

==========

PEAK FLOWRATE TABLE FILE NAME: 0610501U.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	366.96	31.71	0.50(0.49)	0.98	1027.5	50120.00
2	344.28	33.54	0.50(0.49)	0.98	1045.7	50150.00
3	313.44	36.83	0.50(0.49)	0.98	1063.4	50100.00

TOTAL AREA(ACRES) = 1063.4

****

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0

>>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

==========

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	366.96	31.71	0.50(0.49)	0.98	1027.5	50120.00
2	344.28	33.54	0.50(0.49)	0.98	1045.7	50150.00
3	313.44	36.83	0.50(0.49)	0.98	1063.4	50100.00

TOTAL AREA(ACRES) = 1063.4

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 1063.4 TC(MIN.) = 31.71
EFFECTIVE AREA(ACRES) = 1027.53 AREA-AVERAGED Fm(INCH/HR)= 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.981
PEAK FLOW RATE(CFS) = 366.96

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	366.96	31.71	0.860	0.50(0.49)	0.98	1027.5	50120.00
2	344.28	33.54	0.837	0.50(0.49)	0.98	1045.7	50150.00
3	313.44	36.83	0.796	0.50(0.49)	0.98	1063.4	50100.00

==========

==========

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S29.DAT
  TIME/DATE OF STUDY: 08:27 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.701
   2)   10.00;  1.794
   3)   15.00;  1.317
   4)   20.00;  1.127
   5)   25.00;  0.983
   6)   30.00;  0.881
   7)   40.00;  0.755
   8)   50.00;  0.672
   9)   60.00;  0.611
  10)   90.00;  0.508
  11)  120.00;  0.449
  12)  180.00;  0.377
  13)  360.00;  0.279
  14) 1200.00;  0.123
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S27.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    10345.07   27.30  0.50( 0.50) 0.99    5578.5   40500.00
      2    10138.36   38.31  0.50( 0.50) 0.99    8903.2   31600.00
      3     9883.96   49.34  0.50( 0.50) 0.99   12033.2   31400.00
      4     9652.56   59.19  0.50( 0.50) 0.99   14688.5   11801.00
      5     9424.49   70.48  0.50( 0.50) 0.99   17899.0   11500.00
      6     9125.11   82.33  0.50( 0.50) 0.99   21947.7   11000.00
      7     8740.19   98.56  0.50( 0.50) 0.99   28802.4   12500.00
      8     8537.02  104.69  0.50( 0.50) 0.99   31672.9   11910.00
      9     7880.85  113.28  0.50( 0.50) 0.99   34961.6   11130.00
     10     7219.90  124.59  0.50( 0.50) 0.99   38630.2   11620.00
     11     6180.81  140.17  0.50( 0.50) 0.99   43167.8   12400.00
     12     5353.42  151.29  0.50( 0.50) 0.99   45464.5   12201.00
     13     4756.75  160.37  0.50( 0.50) 0.99   46753.7   12111.00
     14     4409.99  165.90  0.50( 0.50) 0.99   47506.3   10700.00
     15     3846.12  175.74  0.50( 0.50) 0.99   48680.6   12261.00
     16     3382.86  184.87  0.50( 0.50) 0.99   49492.4   10200.00
     17     2829.56  199.88  0.50( 0.50) 0.99   50729.8   10300.00
     18     2603.12  206.53  0.50( 0.50) 0.99   51080.9   12010.00
     19     2137.79  226.66  0.50( 0.50) 0.99   51410.2   12000.00
     20     1199.89  293.99  0.50( 0.50) 0.99   52080.4   10100.00
    TOTAL AREA(ACRES) =    52080.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S28.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      366.96   31.71  0.50( 0.49) 0.98    1027.5   50120.00
      2      344.28   33.54  0.50( 0.49) 0.98    1045.7   50150.00
      3      313.44   36.83  0.50( 0.49) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      366.96   31.71  0.50( 0.49) 0.98    1027.5   50120.00
      2      344.28   33.54  0.50( 0.49) 0.98    1045.7   50150.00
      3      313.44   36.83  0.50( 0.49) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =      1063.4
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      366.96   31.71    0.859  0.50( 0.49) 0.98    1027.5   50120.00
      2      344.28   33.54    0.836  0.50( 0.49) 0.98    1045.7   50150.00
      3      313.44   36.83    0.795  0.50( 0.49) 0.98    1063.4   50100.00
  LONGEST FLOWPATH FROM NODE  50150.00 TO NODE  12800.00 =   11349.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    10345.07   27.30    0.936  0.50( 0.50) 0.99    5578.5   40500.00
      2    10138.36   38.31    0.776  0.50( 0.50) 0.99    8903.2   31600.00
      3     9883.96   49.34    0.677  0.50( 0.50) 0.99   12033.2   31400.00
      4     9652.56   59.19    0.616  0.50( 0.50) 0.99   14688.5   11801.00
      5     9424.49   70.48    0.575  0.50( 0.50) 0.99   17899.0   11500.00
      6     9125.11   82.33    0.534  0.50( 0.50) 0.99   21947.7   11000.00
      7     8740.19   98.56    0.491  0.50( 0.50) 0.99   28802.4   12500.00
      8     8537.02  104.69    0.479  0.50( 0.50) 0.99   31672.9   11910.00
      9     7880.85  113.28    0.462  0.50( 0.50) 0.99   34961.6   11130.00
     10     7219.90  124.59    0.443  0.50( 0.50) 0.99   38630.2   11620.00
     11     6180.81  140.17    0.425  0.50( 0.50) 0.99   43167.8   12400.00
     12     5353.42  151.29    0.411  0.50( 0.50) 0.99   45464.5   12201.00
     13     4756.75  160.37    0.401  0.50( 0.50) 0.99   46753.7   12111.00
     14     4409.99  165.90    0.394  0.50( 0.50) 0.99   47506.3   10700.00
     15     3846.12  175.74    0.382  0.50( 0.50) 0.99   48680.6   12261.00
     16     3382.86  184.87    0.374  0.50( 0.50) 0.99   49492.4   10200.00
     17     2829.56  199.88    0.366  0.50( 0.50) 0.99   50729.8   10300.00
     18     2603.12  206.53    0.363  0.50( 0.50) 0.99   51080.9   12010.00
     19     2137.79  226.66    0.352  0.50( 0.50) 0.99   51410.2   12000.00
     20     1199.89  293.99    0.315  0.50( 0.50) 0.99   52080.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    10712.02   27.30    0.936  0.50( 0.49) 0.99    6463.1   40500.00
      2    10629.16   31.71    0.859  0.50( 0.50) 0.99    7938.8   50120.00
      3    10572.26   33.54    0.836  0.50( 0.50) 0.99    8507.5   50150.00
      4    10479.60   36.83    0.795  0.50( 0.50) 0.99    9519.4   50100.00
      5    10432.56   38.31    0.776  0.50( 0.50) 0.99    9966.5   31600.00
      6    10076.23   49.34    0.677  0.50( 0.50) 0.99   13096.6   31400.00
      7     9781.34   59.19    0.616  0.50( 0.50) 0.99   15751.9   11801.00
      8     9511.05   70.48    0.575  0.50( 0.50) 0.99   18962.4   11500.00
      9     9169.73   82.33    0.534  0.50( 0.50) 0.99   23011.1   11000.00
     10     8749.44   98.56    0.491  0.50( 0.50) 0.99   29865.8   12500.00
     11     8546.04  104.69    0.479  0.50( 0.50) 0.99   32736.3   11910.00
     12     7889.55  113.28    0.462  0.50( 0.50) 0.99   36025.0   11130.00
     13     7228.25  124.59    0.443  0.50( 0.50) 0.99   39693.6   11620.00
     14     6188.81  140.17    0.425  0.50( 0.50) 0.99   44231.2   12400.00
     15     5361.16  151.29    0.411  0.50( 0.50) 0.99   46527.9   12201.00
```



```
     16     4764.29  160.37    0.401  0.50( 0.50) 0.99   47817.0   12111.00
     17     4417.41  165.90    0.394  0.50( 0.50) 0.99   48569.7   10700.00
     18     3853.31  175.74    0.382  0.50( 0.50) 0.99   49744.0   12261.00
     19     3389.91  184.87    0.374  0.50( 0.50) 0.99   50555.8   10200.00
     20     2836.46  199.88    0.366  0.50( 0.50) 0.99   51793.1   10300.00
     21     2609.94  206.53    0.363  0.50( 0.50) 0.99   52144.2   12010.00
     22     2144.41  226.66    0.352  0.50( 0.50) 0.99   52473.6   12000.00
     23     1205.82  293.99    0.315  0.50( 0.50) 0.99   53143.8   10100.00
   TOTAL AREA(ACRES) =     53143.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    10712.02  Tc(MIN.) =   27.300
  EFFECTIVE AREA(ACRES) =   6463.07  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53143.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12801.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.00  DOWNSTREAM(FEET) =    234.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.96   CHANNEL SLOPE =  0.0054
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   10712.02
  FLOW VELOCITY(FEET/SEC.) =  14.04   FLOW DEPTH(FEET) =  15.95
  TRAVEL TIME(MIN.) =   1.32   Tc(MIN.) =   28.62
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610502U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)         (ACRES)    NODE
      1       31.02   11.37  0.50( 0.47) 0.94      28.9   50200.00
    TOTAL AREA(ACRES) =       28.9

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	10712.02	28.62	0.909	0.50(0.49)	0.99	6463.1	40500.00
2	10629.16	33.03	0.843	0.50(0.50)	0.99	7938.8	50120.00
3	10572.26	34.86	0.820	0.50(0.50)	0.99	8507.5	50150.00
4	10479.60	38.15	0.778	0.50(0.50)	0.99	9519.4	50100.00
5	10432.56	39.64	0.760	0.50(0.50)	0.99	9966.5	31600.00
6	10076.23	50.68	0.668	0.50(0.50)	0.99	13096.6	31400.00
7	9781.34	60.54	0.609	0.50(0.50)	0.99	15751.9	11801.00
8	9511.05	71.84	0.570	0.50(0.50)	0.99	18962.4	11500.00
9	9169.73	83.70	0.530	0.50(0.50)	0.99	23011.1	11000.00
10	8749.44	99.95	0.488	0.50(0.50)	0.99	29865.8	12500.00
11	8546.04	106.09	0.476	0.50(0.50)	0.99	32736.3	11910.00
12	7889.55	114.71	0.459	0.50(0.50)	0.99	36025.0	11130.00
13	7228.25	126.04	0.442	0.50(0.50)	0.99	39693.6	11620.00
14	6188.81	141.69	0.423	0.50(0.50)	0.99	44231.2	12400.00
15	5361.16	152.86	0.410	0.50(0.50)	0.99	46527.9	12201.00
16	4764.29	161.99	0.399	0.50(0.50)	0.99	47817.0	12111.00
17	4417.41	167.54	0.392	0.50(0.50)	0.99	48569.7	10700.00
18	3853.31	177.45	0.380	0.50(0.50)	0.99	49744.0	12261.00
19	3389.91	186.63	0.373	0.50(0.50)	0.99	50555.8	10200.00
20	2836.46	201.72	0.365	0.50(0.50)	0.99	51793.1	10300.00
21	2609.94	208.41	0.362	0.50(0.50)	0.99	52144.2	12010.00
22	2144.41	228.63	0.351	0.50(0.50)	0.99	52473.6	12000.00
23	1205.82	296.27	0.314	0.50(0.50)	0.99	53143.8	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)		Ap	Ae (ACRES)	HEADWATER NODE
1	31.02	11.37	1.663	0.50(0.47)		0.94	28.9	50200.00

LONGEST FLOWPATH FROM NODE 50200.00 TO NODE 12801.00 = 1426.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)		Ap	Ae (ACRES)	HEADWATER NODE
1	10743.05	11.37	1.663	0.50(0.49)		0.99	2596.7	50200.00
2	10723.47	28.62	0.909	0.50(0.49)		0.99	6491.9	40500.00
3	10638.88	33.03	0.843	0.50(0.49)		0.99	7967.7	50120.00
4	10581.39	34.86	0.820	0.50(0.50)		0.99	8536.3	50150.00
5	10487.65	38.15	0.778	0.50(0.50)		0.99	9548.2	50100.00
6	10440.13	39.64	0.760	0.50(0.50)		0.99	9995.4	31600.00
7	10081.41	50.68	0.668	0.50(0.50)		0.99	13125.5	31400.00
8	9785.00	60.54	0.609	0.50(0.50)		0.99	15780.7	11801.00
9	9513.70	71.84	0.570	0.50(0.50)		0.99	18991.3	11500.00
10	9171.32	83.70	0.530	0.50(0.50)		0.99	23039.9	11000.00
11	8750.25	99.95	0.488	0.50(0.50)		0.99	29894.6	12500.00
12	8546.83	106.09	0.476	0.50(0.50)		0.99	32765.2	11910.00
13	7890.31	114.71	0.459	0.50(0.50)		0.99	36053.9	11130.00
14	7228.98	126.04	0.442	0.50(0.50)		0.99	39722.5	11620.00
15	6189.51	141.69	0.423	0.50(0.50)		0.99	44260.0	12400.00
16	5361.84	152.86	0.410	0.50(0.50)		0.99	46556.8	12201.00
17	4764.95	161.99	0.399	0.50(0.50)		0.99	47845.9	12111.00
18	4418.06	167.54	0.392	0.50(0.50)		0.99	48598.5	10700.00
19	3853.94	177.45	0.380	0.50(0.50)		0.99	49772.9	12261.00
20	3390.53	186.63	0.373	0.50(0.50)		0.99	50584.7	10200.00
21	2837.06	201.72	0.365	0.50(0.50)		0.99	51822.0	10300.00
22	2610.54	208.41	0.362	0.50(0.50)		0.99	52173.1	12010.00
23	2144.99	228.63	0.351	0.50(0.50)		0.99	52502.4	12000.00

24	1206.34	296.27	0.314	0.50(0.50)	0.99	53172.6	10100.00

TOTAL AREA(ACRES) = 53172.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 10743.05 Tc(MIN.) = 11.371
EFFECTIVE AREA(ACRES) = 2596.72 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53172.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

****
FLOW PROCESS FROM NODE 12801.00 TO NODE 12901.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 234.00 DOWNSTREAM(FEET) = 216.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2009.32 CHANNEL SLOPE = 0.0090
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 10743.05
FLOW VELOCITY(FEET/SEC.) = 16.98 FLOW DEPTH(FEET) = 14.52
TRAVEL TIME(MIN.) = 1.97 Tc(MIN.) = 13.34
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610312U.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)		Ap	Ae (ACRES)	HEADWATER NODE
1	104.26	38.12	0.50(0.48)		0.96	385.8	31200.00

TOTAL AREA(ACRES) = 385.8

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)		Ap	Ae (ACRES)	HEADWATER NODE
1	10743.05	13.34	1.475	0.50(0.49)		0.99	2596.7	50200.00
2	10723.47	30.59	0.874	0.50(0.49)		0.99	6491.9	40500.00
3	10638.88	35.01	0.818	0.50(0.49)		0.99	7967.7	50120.00
4	10581.39	36.84	0.795	0.50(0.50)		0.99	8536.3	50150.00
5	10487.65	40.14	0.754	0.50(0.50)		0.99	9548.2	50100.00
6	10440.13	41.62	0.742	0.50(0.50)		0.99	9995.4	31600.00
7	10081.41	52.68	0.656	0.50(0.50)		0.99	13125.5	31400.00
8	9785.00	62.56	0.602	0.50(0.50)		0.99	15780.7	11801.00
9	9513.70	73.88	0.563	0.50(0.50)		0.99	18991.3	11500.00
10	9171.32	85.75	0.523	0.50(0.50)		0.99	23039.9	11000.00
11	8750.25	102.03	0.484	0.50(0.50)		0.99	29894.6	12500.00
12	8546.83	108.17	0.472	0.50(0.50)		0.99	32765.2	11910.00

```
    13     7890.31  116.84    0.455  0.50( 0.50) 0.99   36053.9   11130.00
    14     7228.98  128.22    0.439  0.50( 0.50) 0.99   39722.5   11620.00
    15     6189.51  143.95    0.420  0.50( 0.50) 0.99   44260.0   12400.00
    16     5361.84  155.20    0.407  0.50( 0.50) 0.99   46556.8   12201.00
    17     4764.95  164.40    0.396  0.50( 0.50) 0.99   47845.9   12111.00
    18     4418.06  170.01    0.389  0.50( 0.50) 0.99   48598.5   10700.00
    19     3853.94  180.00    0.377  0.50( 0.50) 0.99   49772.9   12261.00
    20     3390.53  189.26    0.372  0.50( 0.50) 0.99   50584.7   10200.00
    21     2837.06  204.47    0.364  0.50( 0.50) 0.99   51822.0   10300.00
    22     2610.54  211.22    0.360  0.50( 0.50) 0.99   52173.1   12010.00
    23     2144.99  231.58    0.349  0.50( 0.50) 0.99   52502.4   12000.00
    24     1206.34  299.68    0.312  0.50( 0.50) 0.99   53172.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      104.26   38.12    0.779  0.50( 0.48) 0.96     385.8   31200.00
  LONGEST FLOWPATH FROM NODE  31200.00 TO NODE  12901.00 =   11169.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10847.31   13.34    1.475  0.50( 0.49) 0.99    2731.8   50200.00
      2    10827.73   30.59    0.874  0.50( 0.49) 0.99    6801.6   40500.00
      3    10743.15   35.01    0.818  0.50( 0.49) 0.99    8322.0   50120.00
      4    10685.65   36.84    0.795  0.50( 0.49) 0.99    8909.2   50150.00
      5    10649.27   38.12    0.779  0.50( 0.49) 0.99    9314.9   31200.00
      6    10583.31   40.14    0.754  0.50( 0.49) 0.99    9934.0   50100.00
      7    10531.51   41.62    0.742  0.50( 0.49) 0.99   10381.2   31600.00
      8    10143.04   52.68    0.656  0.50( 0.50) 0.99   13511.3   31400.00
      9     9828.11   62.56    0.602  0.50( 0.50) 0.99   16166.5   11801.00
     10     9543.34   73.88    0.563  0.50( 0.50) 0.99   19377.0   11500.00
     11     9186.83   85.75    0.523  0.50( 0.50) 0.99   23425.7   11000.00
     12     8757.76  102.03    0.484  0.50( 0.50) 0.99   30280.4   12500.00
     13     8554.16  108.17    0.472  0.50( 0.50) 0.99   33150.9   11910.00
     14     7897.38  116.84    0.455  0.50( 0.50) 0.99   36439.7   11130.00
     15     7235.79  128.22    0.439  0.50( 0.50) 0.99   40108.2   11620.00
     16     6196.03  143.95    0.420  0.50( 0.50) 0.99   44645.8   12400.00
     17     5368.15  155.20    0.407  0.50( 0.50) 0.99   46942.5   12201.00
     18     4771.09  164.40    0.396  0.50( 0.50) 0.99   48231.7   12111.00
     19     4424.09  170.01    0.389  0.50( 0.50) 0.99   48984.3   10700.00
     20     3859.79  180.00    0.377  0.50( 0.50) 0.99   50158.7   12261.00
     21     3396.30  189.26    0.372  0.50( 0.50) 0.99   50970.4   10200.00
     22     2842.70  204.47    0.364  0.50( 0.50) 0.99   52207.8   10300.00
     23     2616.13  211.22    0.360  0.50( 0.50) 0.99   52558.9   12010.00
     24     2150.41  231.58    0.349  0.50( 0.50) 0.99   52888.2   12000.00
     25     1211.18  299.68    0.312  0.50( 0.50) 0.99   53558.4   10100.00
    TOTAL AREA(ACRES) =     53558.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    10847.31  Tc(MIN.) =   13.343
  EFFECTIVE AREA(ACRES) =   2731.75  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53558.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

****************************************************************************
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  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610503U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      139.23   28.45  0.50( 0.50) 0.99     366.1   50300.00
    TOTAL AREA(ACRES) =      366.1

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10847.31   13.34    1.475  0.50( 0.49) 0.99    2731.8   50200.00
      2    10827.73   30.59    0.874  0.50( 0.49) 0.99    6801.6   40500.00
      3    10743.15   35.01    0.818  0.50( 0.49) 0.99    8322.0   50120.00
      4    10685.65   36.84    0.795  0.50( 0.49) 0.99    8909.2   50150.00
      5    10649.27   38.12    0.779  0.50( 0.49) 0.99    9314.9   31200.00
      6    10583.31   40.14    0.754  0.50( 0.49) 0.99    9934.0   50100.00
      7    10531.51   41.62    0.742  0.50( 0.49) 0.99   10381.2   31600.00
      8    10143.04   52.68    0.656  0.50( 0.50) 0.99   13511.3   31400.00
      9     9828.11   62.56    0.602  0.50( 0.50) 0.99   16166.5   11801.00
     10     9543.34   73.88    0.563  0.50( 0.50) 0.99   19377.0   11500.00
     11     9186.83   85.75    0.523  0.50( 0.50) 0.99   23425.7   11000.00
     12     8757.76  102.03    0.484  0.50( 0.50) 0.99   30280.4   12500.00
     13     8554.16  108.17    0.472  0.50( 0.50) 0.99   33150.9   11910.00
     14     7897.38  116.84    0.455  0.50( 0.50) 0.99   36439.7   11130.00
     15     7235.79  128.22    0.439  0.50( 0.50) 0.99   40108.2   11620.00
     16     6196.03  143.95    0.420  0.50( 0.50) 0.99   44645.8   12400.00
     17     5368.15  155.20    0.407  0.50( 0.50) 0.99   46942.5   12201.00
     18     4771.09  164.40    0.396  0.50( 0.50) 0.99   48231.7   12111.00
     19     4424.09  170.01    0.389  0.50( 0.50) 0.99   48984.3   10700.00
     20     3859.79  180.00    0.377  0.50( 0.50) 0.99   50158.7   12261.00
     21     3396.30  189.26    0.372  0.50( 0.50) 0.99   50970.4   10200.00
     22     2842.70  204.47    0.364  0.50( 0.50) 0.99   52207.8   10300.00
     23     2616.13  211.22    0.360  0.50( 0.50) 0.99   52558.9   12010.00
     24     2150.41  231.58    0.349  0.50( 0.50) 0.99   52888.2   12000.00
     25     1211.18  299.68    0.312  0.50( 0.50) 0.99   53558.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      139.23   28.45    0.913  0.50( 0.50) 0.99     366.1   50300.00
  LONGEST FLOWPATH FROM NODE  50300.00 TO NODE  12901.00 =    8614.00 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10986.54	13.34	1.475	0.50(0.49)	0.99	2903.5	50200.00
2	10969.40	28.45	0.913	0.50(0.49)	0.99	6660.9	50300.00
3	10953.86	30.59	0.874	0.50(0.49)	0.99	7167.7	40500.00
4	10850.66	35.01	0.818	0.50(0.49)	0.99	8688.1	50120.00
5	10785.47	36.84	0.795	0.50(0.49)	0.99	9275.3	50150.00
6	10743.69	38.12	0.779	0.50(0.49)	0.99	9681.0	31200.00
7	10669.42	40.14	0.754	0.50(0.49)	0.99	10300.1	50100.00
8	10613.51	41.62	0.742	0.50(0.49)	0.99	10747.3	31600.00
9	10196.33	52.68	0.656	0.50(0.50)	0.99	13877.4	31400.00
10	9863.54	62.56	0.602	0.50(0.50)	0.99	16532.6	11801.00
11	9565.78	73.88	0.563	0.50(0.50)	0.99	19743.2	11500.00
12	9195.64	85.75	0.523	0.50(0.50)	0.99	23791.8	11000.00
13	8759.04	102.03	0.484	0.50(0.50)	0.99	30646.5	12500.00
14	8555.41	108.17	0.472	0.50(0.50)	0.99	33517.0	11910.00
15	7898.58	116.84	0.455	0.50(0.50)	0.99	36805.8	11130.00
16	7236.96	128.22	0.439	0.50(0.50)	0.99	40474.4	11620.00
17	6197.15	143.95	0.420	0.50(0.50)	0.99	45011.9	12400.00
18	5369.23	155.20	0.407	0.50(0.50)	0.99	47308.6	12201.00
19	4772.14	164.40	0.396	0.50(0.50)	0.99	48597.8	12111.00
20	4425.12	170.01	0.389	0.50(0.50)	0.99	49350.4	10700.00
21	3860.79	180.00	0.377	0.50(0.50)	0.99	50524.8	12261.00
22	3397.28	189.26	0.372	0.50(0.50)	0.99	51336.5	10200.00
23	2843.67	204.47	0.364	0.50(0.50)	0.99	52573.9	10300.00
24	2617.08	211.22	0.360	0.50(0.50)	0.99	52925.0	12010.00
25	2151.33	231.58	0.349	0.50(0.50)	0.99	53254.3	12000.00
26	1212.00	299.68	0.312	0.50(0.50)	0.99	53924.5	10100.00

TOTAL AREA(ACRES) = 53924.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 10986.54 Tc(MIN.) = 13.343
EFFECTIVE AREA(ACRES) = 2903.50 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53924.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12902.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 216.00 DOWNSTREAM(FEET) = 215.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 122.04 CHANNEL SLOPE = 0.0082
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 10986.54
FLOW VELOCITY(FEET/SEC.) = 16.51 FLOW DEPTH(FEET) = 14.90
TRAVEL TIME(MIN.) = 0.12 Tc(MIN.) = 13.47
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12902.00 = 115038.03 FEET.

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12902.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<

==

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 215.00 DOWNSTREAM(FEET) = 214.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 895.53 CHANNEL SLOPE = 0.0011
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
CAPACITY(NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
ALLOWABLE DEPTH).
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

CHANNEL FLOW THRU SUBAREA(CFS) = 10986.54
FLOW VELOCITY(FEET/SEC.) = 9.16 FLOW DEPTH(FEET) = 20.00
TRAVEL TIME(MIN.) = 1.63 Tc(MIN.) = 15.10
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==

****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: 0610504U.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	44.57	18.38	0.50(0.49)	0.97	70.7	50400.00

TOTAL AREA(ACRES) = 70.7

****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10986.54	15.10	1.313	0.50(0.49)	0.99	2903.5	50200.00
2	10969.40	30.20	0.878	0.50(0.49)	0.99	6660.9	50300.00
3	10953.86	32.35	0.851	0.50(0.49)	0.99	7167.7	40500.00
4	10850.66	36.79	0.795	0.50(0.49)	0.99	8688.1	50120.00
5	10785.47	38.62	0.772	0.50(0.49)	0.99	9275.3	50150.00
6	10743.69	39.91	0.756	0.50(0.49)	0.99	9681.0	31200.00
7	10669.42	41.94	0.739	0.50(0.49)	0.99	10300.1	50100.00

```
     8    10613.51   43.43    0.726  0.50( 0.49) 0.99   10747.3   31600.00
     9    10196.33   54.56    0.644  0.50( 0.50) 0.99   13877.4   31400.00
    10     9863.54   64.50    0.596  0.50( 0.50) 0.99   16532.6   11801.00
    11     9565.78   75.88    0.556  0.50( 0.50) 0.99   19743.2   11500.00
    12     9195.64   87.83    0.515  0.50( 0.50) 0.99   23791.8   11000.00
    13     8759.04  104.18    0.480  0.50( 0.50) 0.99   30646.5   12500.00
    14     8555.41  110.34    0.468  0.50( 0.50) 0.99   33517.0   11910.00
    15     7898.58  119.05    0.451  0.50( 0.50) 0.99   36805.8   11130.00
    16     7236.96  130.48    0.436  0.50( 0.50) 0.99   40474.4   11620.00
    17     6197.15  146.30    0.417  0.50( 0.50) 0.99   45011.9   12400.00
    18     5369.23  157.63    0.404  0.50( 0.50) 0.99   47308.6   12201.00
    19     4772.14  166.91    0.393  0.50( 0.50) 0.99   48597.8   12111.00
    20     4425.12  172.56    0.386  0.50( 0.50) 0.99   49350.4   10700.00
    21     3860.79  182.64    0.376  0.50( 0.50) 0.99   50524.8   12261.00
    22     3397.28  191.99    0.370  0.50( 0.50) 0.99   51336.5   10200.00
    23     2843.67  207.32    0.362  0.50( 0.50) 0.99   52573.9   10300.00
    24     2617.08  214.13    0.358  0.50( 0.50) 0.99   52925.0   12010.00
    25     2151.33  234.64    0.347  0.50( 0.50) 0.99   53254.3   12000.00
    26     1212.00  303.21    0.310  0.50( 0.50) 0.99   53924.5   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12903.00 =  115933.56 FEET.

** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1       44.57   18.38    1.188  0.50( 0.49) 0.97      70.7   50400.00
LONGEST FLOWPATH FROM NODE  50400.00 TO NODE  12903.00 =    3607.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    11029.66   15.10    1.313  0.50( 0.49) 0.99    2961.5   50200.00
    2    11027.38   18.38    1.188  0.50( 0.49) 0.99    3791.3   50400.00
    3    10994.26   30.20    0.878  0.50( 0.49) 0.99    6731.5   50300.00
    4    10976.99   32.35    0.851  0.50( 0.49) 0.99    7238.3   40500.00
    5    10870.24   36.79    0.795  0.50( 0.49) 0.99    8758.8   50120.00
    6    10803.58   38.62    0.772  0.50( 0.49) 0.99    9345.9   50150.00
    7    10760.77   39.91    0.756  0.50( 0.49) 0.99    9751.7   31200.00
    8    10685.41   41.94    0.739  0.50( 0.49) 0.99   10370.8   50100.00
    9    10628.71   43.43    0.726  0.50( 0.49) 0.99   10818.0   31600.00
   10    10206.29   54.56    0.644  0.50( 0.50) 0.99   13948.1   31400.00
   11     9870.41   64.50    0.596  0.50( 0.50) 0.99   16603.3   11801.00
   12     9570.17   75.88    0.556  0.50( 0.50) 0.99   19813.8   11500.00
   13     9197.42   87.83    0.515  0.50( 0.50) 0.99   23862.5   11000.00
   14     8759.82  104.18    0.480  0.50( 0.50) 0.99   30717.2   12500.00
   15     8556.16  110.34    0.468  0.50( 0.50) 0.99   33587.7   11910.00
   16     7899.31  119.05    0.451  0.50( 0.50) 0.99   36876.5   11130.00
   17     7237.66  130.48    0.436  0.50( 0.50) 0.99   40545.0   11620.00
   18     6197.82  146.30    0.417  0.50( 0.50) 0.99   45082.6   12400.00
   19     5369.88  157.63    0.404  0.50( 0.50) 0.99   47379.3   12201.00
   20     4772.77  166.91    0.393  0.50( 0.50) 0.99   48668.5   12111.00
   21     4425.75  172.56    0.386  0.50( 0.50) 0.99   49421.1   10700.00
   22     3861.39  182.64    0.376  0.50( 0.50) 0.99   50595.4   12261.00
   23     3397.88  191.99    0.370  0.50( 0.50) 0.99   51407.2   10200.00
   24     2844.25  207.32    0.362  0.50( 0.50) 0.99   52644.6   10300.00
   25     2617.66  214.13    0.358  0.50( 0.50) 0.99   52995.7   12010.00
   26     2151.89  234.64    0.347  0.50( 0.50) 0.99   53325.0   12000.00
   27     1212.50  303.21    0.310  0.50( 0.50) 0.99   53995.2   10100.00
  TOTAL AREA(ACRES) =     53995.2
```



```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    11029.66  Tc(MIN.) =   15.097
  EFFECTIVE AREA(ACRES) =   2961.54  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53995.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12903.00 =  115933.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12903.00 TO NODE  12904.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    214.00  DOWNSTREAM(FEET) =    213.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   767.57   CHANNEL SLOPE =  0.0013
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

  CHANNEL FLOW THRU SUBAREA(CFS) =   11029.66
  FLOW VELOCITY(FEET/SEC.) =   9.19   FLOW DEPTH(FEET) =  20.00
  TRAVEL TIME(MIN.) =   1.39   Tc(MIN.) =   16.49
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12904.00 =  116701.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610311U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER      (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       36.26   33.63   0.50( 0.48) 0.97     114.8   31100.00
    TOTAL AREA(ACRES) =      114.8

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11029.66   16.49    1.260  0.50( 0.49) 0.99    2961.5   50200.00
```

```
     2    11027.38   19.77    1.136  0.50( 0.49) 0.99    3791.3   50400.00
     3    10994.26   31.60    0.861  0.50( 0.49) 0.99    6731.5   50300.00
     4    10976.99   33.75    0.834  0.50( 0.49) 0.99    7238.3   40500.00
     5    10870.24   38.20    0.778  0.50( 0.49) 0.99    8758.8   50120.00
     6    10803.58   40.04    0.755  0.50( 0.49) 0.99    9345.9   50150.00
     7    10760.77   41.34    0.744  0.50( 0.49) 0.99    9751.7   31200.00
     8    10685.41   43.38    0.727  0.50( 0.49) 0.99   10370.8   50100.00
     9    10628.71   44.88    0.715  0.50( 0.49) 0.99   10818.0   31600.00
    10    10206.29   56.07    0.635  0.50( 0.50) 0.99   13948.1   31400.00
    11     9870.41   66.06    0.590  0.50( 0.50) 0.99   16603.3   11801.00
    12     9570.17   77.47    0.551  0.50( 0.50) 0.99   19813.8   11500.00
    13     9197.42   89.45    0.510  0.50( 0.50) 0.99   23862.5   11000.00
    14     8759.82  105.81    0.477  0.50( 0.50) 0.99   30717.2   12500.00
    15     8556.16  111.98    0.465  0.50( 0.50) 0.99   33587.7   11910.00
    16     7899.31  120.72    0.448  0.50( 0.50) 0.99   36876.5   11130.00
    17     7237.66  132.19    0.434  0.50( 0.50) 0.99   40545.0   11620.00
    18     6197.82  148.08    0.415  0.50( 0.50) 0.99   45082.6   12400.00
    19     5369.88  159.48    0.402  0.50( 0.50) 0.99   47379.3   12201.00
    20     4772.77  168.81    0.390  0.50( 0.50) 0.99   48668.5   12111.00
    21     4425.75  174.50    0.384  0.50( 0.50) 0.99   49421.1   10700.00
    22     3861.39  184.64    0.374  0.50( 0.50) 0.99   50595.4   12261.00
    23     3397.88  194.06    0.369  0.50( 0.50) 0.99   51407.2   10200.00
    24     2844.25  209.48    0.361  0.50( 0.50) 0.99   52644.6   10300.00
    25     2617.66  216.34    0.357  0.50( 0.50) 0.99   52995.7   12010.00
    26     2151.89  236.96    0.346  0.50( 0.50) 0.99   53325.0   12000.00
    27     1212.50  305.89    0.308  0.50( 0.50) 0.99   53995.2   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12904.00 =  116701.13 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1       36.26   33.63    0.835  0.50( 0.48) 0.97     114.8   31100.00
LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  12904.00 =    6503.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    11065.92   16.49    1.260  0.50( 0.49) 0.99    3017.8   50200.00
    2    11063.64   19.77    1.136  0.50( 0.49) 0.99    3858.8   50400.00
    3    11030.52   31.60    0.861  0.50( 0.49) 0.99    6839.4   50300.00
    4    11014.22   33.63    0.835  0.50( 0.49) 0.99    7324.8   31100.00
    5    11013.10   33.75    0.834  0.50( 0.49) 0.99    7353.2   40500.00
    6    10900.56   38.20    0.778  0.50( 0.49) 0.99    8873.6   50120.00
    7    10831.52   40.04    0.755  0.50( 0.49) 0.99    9460.8   50150.00
    8    10787.60   41.34    0.744  0.50( 0.49) 0.99    9866.5   31200.00
    9    10710.49   43.38    0.727  0.50( 0.49) 0.99   10485.6   50100.00
   10    10652.50   44.88    0.715  0.50( 0.49) 0.99   10932.8   31600.00
   11    10221.87   56.07    0.635  0.50( 0.50) 0.99   14062.9   31400.00
   12     9881.36   66.06    0.590  0.50( 0.50) 0.99   16718.1   11801.00
   13     9577.07   77.47    0.551  0.50( 0.50) 0.99   19928.6   11500.00
   14     9200.08   89.45    0.510  0.50( 0.50) 0.99   23977.3   11000.00
   15     8761.40  105.81    0.477  0.50( 0.50) 0.99   30832.0   12500.00
   16     8557.71  111.98    0.465  0.50( 0.50) 0.99   33702.5   11910.00
   17     7900.80  120.72    0.448  0.50( 0.50) 0.99   36991.3   11130.00
   18     7239.10  132.19    0.434  0.50( 0.50) 0.99   40659.8   11620.00
   19     6199.20  148.08    0.415  0.50( 0.50) 0.99   45197.4   12400.00
   20     5371.21  159.48    0.402  0.50( 0.50) 0.99   47494.1   12201.00
   21     4774.07  168.81    0.390  0.50( 0.50) 0.99   48783.3   12111.00
```



```
   22     4427.02  174.50    0.384  0.50( 0.50) 0.99   49535.9   10700.00
   23     3862.64  184.64    0.374  0.50( 0.50) 0.99   50710.3   12261.00
   24     3399.11  194.06    0.369  0.50( 0.50) 0.99   51522.0   10200.00
   25     2845.45  209.48    0.361  0.50( 0.50) 0.99   52759.4   10300.00
   26     2618.85  216.34    0.357  0.50( 0.50) 0.99   53110.5   12010.00
   27     2153.04  236.96    0.346  0.50( 0.50) 0.99   53439.8   12000.00
   28     1213.53  305.89    0.308  0.50( 0.50) 0.99   54110.0   10100.00
  TOTAL AREA(ACRES) =     54110.0

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    11065.92  Tc(MIN.) =   16.489
 EFFECTIVE AREA(ACRES) =   3017.84  AREA-AVERAGED Fm(INCH/HR) =  0.49
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    54110.0
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12904.00 =  116701.13 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    54110.0  TC(MIN.) =     16.49
 EFFECTIVE AREA(ACRES) =   3017.84  AREA-AVERAGED Fm(INCH/HR)=  0.49
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.987
 PEAK FLOW RATE(CFS)   =   11065.92

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    11065.92   16.49    1.260  0.50( 0.49) 0.99    3017.8   50200.00
     2    11063.64   19.77    1.136  0.50( 0.49) 0.99    3858.8   50400.00
     3    11030.52   31.60    0.861  0.50( 0.49) 0.99    6839.4   50300.00
     4    11014.22   33.63    0.835  0.50( 0.49) 0.99    7324.8   31100.00
     5    11013.10   33.75    0.834  0.50( 0.49) 0.99    7353.2   40500.00
     6    10900.56   38.20    0.778  0.50( 0.49) 0.99    8873.6   50120.00
     7    10831.52   40.04    0.755  0.50( 0.49) 0.99    9460.8   50150.00
     8    10787.60   41.34    0.744  0.50( 0.49) 0.99    9866.5   31200.00
     9    10710.49   43.38    0.727  0.50( 0.49) 0.99   10485.6   50100.00
    10    10652.50   44.88    0.715  0.50( 0.49) 0.99   10932.8   31600.00
    11    10221.87   56.07    0.635  0.50( 0.50) 0.99   14062.9   31400.00
    12     9881.36   66.06    0.590  0.50( 0.50) 0.99   16718.1   11801.00
    13     9577.07   77.47    0.551  0.50( 0.50) 0.99   19928.6   11500.00
    14     9200.08   89.45    0.510  0.50( 0.50) 0.99   23977.3   11000.00
    15     8761.40  105.81    0.477  0.50( 0.50) 0.99   30832.0   12500.00
    16     8557.71  111.98    0.465  0.50( 0.50) 0.99   33702.5   11910.00
    17     7900.80  120.72    0.448  0.50( 0.50) 0.99   36991.3   11130.00
    18     7239.10  132.19    0.434  0.50( 0.50) 0.99   40659.8   11620.00
    19     6199.20  148.08    0.415  0.50( 0.50) 0.99   45197.4   12400.00
    20     5371.21  159.48    0.402  0.50( 0.50) 0.99   47494.1   12201.00
    21     4774.07  168.81    0.390  0.50( 0.50) 0.99   48783.3   12111.00
    22     4427.02  174.50    0.384  0.50( 0.50) 0.99   49535.9   10700.00
    23     3862.64  184.64    0.374  0.50( 0.50) 0.99   50710.3   12261.00
    24     3399.11  194.06    0.369  0.50( 0.50) 0.99   51522.0   10200.00
    25     2845.45  209.48    0.361  0.50( 0.50) 0.99   52759.4   10300.00
    26     2618.85  216.34    0.357  0.50( 0.50) 0.99   53110.5   12010.00
    27     2153.04  236.96    0.346  0.50( 0.50) 0.99   53439.8   12000.00
    28     1213.53  305.89    0.308  0.50( 0.50) 0.99   54110.0   10100.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
        (c) Copyright 1983-2013 Advanced Engineering Software (aes)
            Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:

                      Michael Baker International
                    5 Hutton Centre Drive, Suite 500
                            Santa Ana, CA
                                92707

 ************************ DESCRIPTION OF STUDY ************************
*                                                                      *
*                                                                      *
*                                                                      *
 ************************************************************************

  FILE NAME: S30.DAT
  TIME/DATE OF STUDY: 07:22 07/16/2018
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.184
   2)   10.00;  1.510
   3)   15.00;  1.203
   4)   20.00;  1.023
   5)   25.00;  0.902
   6)   30.00;  0.826
   7)   40.00;  0.693
   8)   50.00;  0.611
   9)   60.00;  0.546
  10)   90.00;  0.439
  11)  120.00;  0.374
  12)  180.00;  0.306
  13)  360.00;  0.211
  14) 1440.00;  0.088
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
```



```
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

************************************************************************
  FLOW PROCESS FROM NODE  13000.00 TO NODE  13001.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   279.24
  ELEVATION DATA: UPSTREAM(FEET) =   1187.54  DOWNSTREAM(FEET) =   1104.45

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.560
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.704
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.65      0.50     1.000     0    8.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.70
  TOTAL AREA(ACRES) =      0.65   PEAK FLOW RATE(CFS) =      0.70

************************************************************************
  FLOW PROCESS FROM NODE  13001.00 TO NODE  13002.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1104.45  DOWNSTREAM(FEET) =   1034.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   736.73   CHANNEL SLOPE =  0.0945
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.492
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       19.74      0.50     0.968     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.968
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.11
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   1.73
  Tc(MIN.) =   10.29
  SUBAREA AREA(ACRES) =    19.74       SUBAREA RUNOFF(CFS) =   17.91
  EFFECTIVE AREA(ACRES) =     20.39     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      18.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   8.35
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13002.00 =    1015.97 FEET.

************************************************************************
```

```
  FLOW PROCESS FROM NODE  13002.00 TO NODE  13003.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1034.82  DOWNSTREAM(FEET) =    986.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1305.95   CHANNEL SLOPE =  0.0368
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.316
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.90      0.50     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.59
  AVERAGE FLOW DEPTH(FEET) =   1.50   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   13.15
  SUBAREA AREA(ACRES) =    83.90       SUBAREA RUNOFF(CFS) =   65.26
  EFFECTIVE AREA(ACRES) =    104.29     AREA-AVERAGED Fm(INCH/HR) =   0.46
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =      104.3         PEAK FLOW RATE(CFS) =      80.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.78   FLOW VELOCITY(FEET/SEC.) =   8.47
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13003.00 =    2321.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13003.00 TO NODE  13004.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    986.71  DOWNSTREAM(FEET) =    939.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.54   CHANNEL SLOPE =  0.0361
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.180
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.50     0.871     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.871
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      96.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.81
  AVERAGE FLOW DEPTH(FEET) =   1.91   TRAVEL TIME(MIN.) =   2.50
  Tc(MIN.) =   15.65
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   31.77
  EFFECTIVE AREA(ACRES) =    151.73     AREA-AVERAGED Fm(INCH/HR) =   0.45
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =      99.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   8.87
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13004.00 =    3640.46 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.06  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1954.61   CHANNEL SLOPE =  0.0397
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.058
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       77.87      0.50     0.856     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.856
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.66
  AVERAGE FLOW DEPTH(FEET) =   2.05   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   19.02
  SUBAREA AREA(ACRES) =    77.87       SUBAREA RUNOFF(CFS) =   44.16
  EFFECTIVE AREA(ACRES) =    229.60     AREA-AVERAGED Fm(INCH/HR) =   0.44
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =      229.6         PEAK FLOW RATE(CFS) =     127.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.08   FLOW VELOCITY(FEET/SEC.) =   9.79
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13020.00 =    5595.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.02
  RAINFALL INTENSITY(INCH/HR) =   1.06
  AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     229.60
  TOTAL STREAM AREA(ACRES) =     229.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     127.05

****************************************************************************
  FLOW PROCESS FROM NODE  13010.00 TO NODE  13011.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   284.64
  ELEVATION DATA: UPSTREAM(FEET) =   1190.91  DOWNSTREAM(FEET) =   1110.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.716
```

```
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.683
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
NATURAL FAIR COVER
"OPEN BRUSH"                -        0.91      0.50     1.000     0    8.72
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
SUBAREA RUNOFF(CFS) =      0.97
TOTAL AREA(ACRES) =      0.91   PEAK FLOW RATE(CFS) =      0.97

****************************************************************************
FLOW PROCESS FROM NODE  13011.00 TO NODE  13012.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 1110.50  DOWNSTREAM ELEVATION(FEET) = 1068.16
STREET LENGTH(FEET) =   581.12   CURB HEIGHT(INCHES) =  8.0
STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.018
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.56
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.27
  HALFSTREET FLOOD WIDTH(FEET) =    6.28
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.09
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.40
STREET FLOW TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =   10.62
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.472
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -       10.46      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
SUBAREA AREA(ACRES) =   10.46      SUBAREA RUNOFF(CFS) =    9.15
EFFECTIVE AREA(ACRES) =     11.37    AREA-AVERAGED Fm(INCH/HR) =  0.50
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  1.00
TOTAL AREA(ACRES) =       11.4        PEAK FLOW RATE(CFS) =       9.94

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   8.78
FLOW VELOCITY(FEET/SEC.) =  5.63   DEPTH*VELOCITY(FT*FT/SEC.) =   1.80
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13012.00 =     865.76 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  13012.00 TO NODE  13013.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```



```
>>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 1068.16  DOWNSTREAM ELEVATION(FEET) =  994.58
STREET LENGTH(FEET) =  1505.98   CURB HEIGHT(INCHES) =  8.0
STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.018
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.09
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.41
  HALFSTREET FLOOD WIDTH(FEET) =   13.95
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.72
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.36
STREET FLOW TRAVEL TIME(MIN.) =   4.39   Tc(MIN.) =   15.01
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.203
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -       35.49      0.50     0.901     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.901
SUBAREA AREA(ACRES) =   35.49      SUBAREA RUNOFF(CFS) =   24.02
EFFECTIVE AREA(ACRES) =     46.86    AREA-AVERAGED Fm(INCH/HR) =  0.46
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.93
TOTAL AREA(ACRES) =       46.9        PEAK FLOW RATE(CFS) =      31.21

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.13
FLOW VELOCITY(FEET/SEC.) =  6.20   DEPTH*VELOCITY(FT*FT/SEC.) =   2.79
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13013.00 =    2371.74 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  13013.00 TO NODE  13014.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    994.58  DOWNSTREAM(FEET) =    944.96
CHANNEL LENGTH THRU SUBAREA(FEET) =  1798.86   CHANNEL SLOPE =  0.0276
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.047
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -       73.31      0.50     0.616     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.616
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.59
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.93
```

```
  AVERAGE FLOW DEPTH(FEET) =   1.64   TRAVEL TIME(MIN.) =   4.33
  Tc(MIN.) =   19.33
  SUBAREA AREA(ACRES) =    73.31       SUBAREA RUNOFF(CFS) =   48.75
  EFFECTIVE AREA(ACRES) =    120.17     AREA-AVERAGED Fm(INCH/HR) =   0.37
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.74
  TOTAL AREA(ACRES) =      120.2          PEAK FLOW RATE(CFS) =      73.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =   7.44
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13014.00 =    4170.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    944.96  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1519.40   CHANNEL SLOPE =  0.0549
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.979
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.22      0.50     0.810     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.810
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      94.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.25
  AVERAGE FLOW DEPTH(FEET) =   1.75   TRAVEL TIME(MIN.) =   2.47
  Tc(MIN.) =   21.81
  SUBAREA AREA(ACRES) =    80.22       SUBAREA RUNOFF(CFS) =   41.45
  EFFECTIVE AREA(ACRES) =    200.39     AREA-AVERAGED Fm(INCH/HR) =   0.38
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      200.4          PEAK FLOW RATE(CFS) =     107.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.84   FLOW VELOCITY(FEET/SEC.) =  10.57
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.81
  RAINFALL INTENSITY(INCH/HR) =   0.98
  AREA-AVERAGED Fm(INCH/HR) =  0.38
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.77
  EFFECTIVE STREAM AREA(ACRES) =     200.39
  TOTAL STREAM AREA(ACRES) =     200.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     107.52
```



```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      127.05   19.02    1.058  0.50( 0.44) 0.89     229.6   13000.00
      2      107.52   21.81    0.979  0.50( 0.38) 0.77     200.4   13010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      233.26   19.02    1.058  0.50( 0.42) 0.83     404.4   13000.00
      2      218.24   21.81    0.979  0.50( 0.42) 0.83     430.0   13010.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     233.26    Tc(MIN.) =    19.02
  EFFECTIVE AREA(ACRES) =     404.38   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =      430.0
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13020.00 TO NODE  13021.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    861.53  DOWNSTREAM(FEET) =    843.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1274.71   CHANNEL SLOPE =  0.0139
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.981
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.78      0.50     0.818     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.818
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     254.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.85
  AVERAGE FLOW DEPTH(FEET) =   3.29   TRAVEL TIME(MIN.) =   2.71
  Tc(MIN.) =   21.73
  SUBAREA AREA(ACRES) =    80.78       SUBAREA RUNOFF(CFS) =   41.59
  EFFECTIVE AREA(ACRES) =    485.16     AREA-AVERAGED Fm(INCH/HR) =   0.42
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =      510.8          PEAK FLOW RATE(CFS) =     246.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.25   FLOW VELOCITY(FEET/SEC.) =   7.77
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13021.00 =    6964.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13021.00 TO NODE  13022.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    843.84  DOWNSTREAM(FEET) =    842.14
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1448.62   CHANNEL SLOPE =  0.0012
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.835
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      124.44      0.50     0.803     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.803
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     271.12
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.16
 AVERAGE FLOW DEPTH(FEET) =   5.35   TRAVEL TIME(MIN.) =   7.65
 Tc(MIN.) =   29.38
 SUBAREA AREA(ACRES) =   124.44       SUBAREA RUNOFF(CFS) =   48.59
 EFFECTIVE AREA(ACRES) =    609.60     AREA-AVERAGED Fm(INCH/HR) =   0.41
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =      635.2         PEAK FLOW RATE(CFS) =     246.78
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.16   FLOW VELOCITY(FEET/SEC.) =   3.09
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13022.00 =    8413.33 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13022.00 TO NODE  13023.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    842.14  DOWNSTREAM(FEET) =    806.85
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.95   CHANNEL SLOPE =  0.0246
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.803
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      324.46      0.50     0.786     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.786
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     306.67
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.18
 AVERAGE FLOW DEPTH(FEET) =   3.17   TRAVEL TIME(MIN.) =   2.35
 Tc(MIN.) =   31.72
 SUBAREA AREA(ACRES) =   324.46       SUBAREA RUNOFF(CFS) =  119.71
 EFFECTIVE AREA(ACRES) =    934.06     AREA-AVERAGED Fm(INCH/HR) =   0.41
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =      959.7         PEAK FLOW RATE(CFS) =     333.67

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.27   FLOW VELOCITY(FEET/SEC.) =  10.41
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13023.00 =    9846.28 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13023.00 TO NODE  13024.00 IS CODE =  51
----------------------------------------------------------------------------
```



```
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    806.85  DOWNSTREAM(FEET) =    767.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =   940.17   CHANNEL SLOPE =  0.0423
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.787
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      367.12      0.50     0.795     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.795
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     398.07
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.32
 AVERAGE FLOW DEPTH(FEET) =   3.16   TRAVEL TIME(MIN.) =   1.18
 Tc(MIN.) =   32.90
 SUBAREA AREA(ACRES) =   367.12       SUBAREA RUNOFF(CFS) =  128.79
 EFFECTIVE AREA(ACRES) =   1301.18     AREA-AVERAGED Fm(INCH/HR) =   0.40
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     1326.8         PEAK FLOW RATE(CFS) =     449.31

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.30   FLOW VELOCITY(FEET/SEC.) =  13.75
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13024.00 =   10786.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13024.00 TO NODE  13025.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    767.07  DOWNSTREAM(FEET) =    697.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3026.62   CHANNEL SLOPE =  0.0230
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.727
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      315.24      0.50     0.867     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     491.03
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.19
 AVERAGE FLOW DEPTH(FEET) =   3.83   TRAVEL TIME(MIN.) =   4.51
 Tc(MIN.) =   37.41
 SUBAREA AREA(ACRES) =   315.24       SUBAREA RUNOFF(CFS) =   83.36
 EFFECTIVE AREA(ACRES) =   1616.42     AREA-AVERAGED Fm(INCH/HR) =   0.41
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.82
 TOTAL AREA(ACRES) =     1642.0         PEAK FLOW RATE(CFS) =     462.43

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.74   FLOW VELOCITY(FEET/SEC.) =  11.01
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13025.00 =   13813.07 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE =  51
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    697.38  DOWNSTREAM(FEET) =    662.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.69   CHANNEL SLOPE =  0.0147
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.681
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      374.11      0.50     0.748     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.748
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     514.00
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.57
 AVERAGE FLOW DEPTH(FEET) =   4.23   TRAVEL TIME(MIN.) =   4.12
 Tc(MIN.) =   41.52
 SUBAREA AREA(ACRES) =   374.11       SUBAREA RUNOFF(CFS) =  103.15
 EFFECTIVE AREA(ACRES) =   1990.53     AREA-AVERAGED Fm(INCH/HR) =   0.40
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     2016.1         PEAK FLOW RATE(CFS) =     497.26

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.18   FLOW VELOCITY(FEET/SEC.) =   9.47
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13026.00 =   16175.76 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     2016.1  TC(MIN.) =     41.52
 EFFECTIVE AREA(ACRES) =   1990.53  AREA-AVERAGED Fm(INCH/HR)=  0.40
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.806
 PEAK FLOW RATE(CFS)   =     497.26

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      497.26   41.52    0.681  0.50( 0.40) 0.81    1990.5   13000.00
     2      455.27   44.81    0.654  0.50( 0.40) 0.81    2016.1   13010.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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            Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:

                      Michael Baker International
                    5 Hutton Centre Drive, Suite 500
                             Santa Ana, CA
                                 92707

------------------------------------------------------------------------
  FILE NAME: S31.DAT
  TIME/DATE OF STUDY: 07:23 07/16/2018
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.184
   2)   10.00;  1.510
   3)   15.00;  1.203
   4)   20.00;  1.023
   5)   25.00;  0.902
   6)   30.00;  0.826
   7)   40.00;  0.693
   8)   50.00;  0.611
   9)   60.00;  0.546
  10)   90.00;  0.439
  11)  120.00;  0.374
  12)  180.00;  0.306
  13)  360.00;  0.211
  14) 1440.00;  0.088
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  13100.00 TO NODE  13101.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   282.58
  ELEVATION DATA: UPSTREAM(FEET) =   1069.66  DOWNSTREAM(FEET) =    969.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.312
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.738
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.94      0.50     1.000     0    8.31
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.05
  TOTAL AREA(ACRES) =      0.94   PEAK FLOW RATE(CFS) =      1.05

************************************************************************
  FLOW PROCESS FROM NODE  13101.00 TO NODE  13102.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    969.92  DOWNSTREAM(FEET) =    807.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.89   CHANNEL SLOPE =  0.2444
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.477
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.67      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.99
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   10.54
  SUBAREA AREA(ACRES) =     7.67       SUBAREA RUNOFF(CFS) =    6.74
  EFFECTIVE AREA(ACRES) =      8.61     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.6         PEAK FLOW RATE(CFS) =       7.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   5.68
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13102.00 =     948.47 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  13102.00 TO NODE  13103.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    807.20  DOWNSTREAM(FEET) =    769.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   691.01   CHANNEL SLOPE =  0.0539
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.292
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       20.65      0.50     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.83
  AVERAGE FLOW DEPTH(FEET) =   1.14   TRAVEL TIME(MIN.) =   3.01
  Tc(MIN.) =   13.54
  SUBAREA AREA(ACRES) =    20.65       SUBAREA RUNOFF(CFS) =   14.73
  EFFECTIVE AREA(ACRES) =     29.26     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3         PEAK FLOW RATE(CFS) =      20.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.29   FLOW VELOCITY(FEET/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13103.00 =    1639.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   769.94  DOWNSTREAM(FEET) =   693.88
  FLOW LENGTH(FEET) =  1563.10   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   9.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.19
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.87
  PIPE TRAVEL TIME(MIN.) =   1.84    Tc(MIN.) =   15.38
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13104.00 =    3202.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.38
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.189
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.00      0.50     0.750     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.750
  SUBAREA AREA(ACRES) =   28.00      SUBAREA RUNOFF(CFS) =   20.52
  EFFECTIVE AREA(ACRES) =     57.26   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =       57.3       PEAK FLOW RATE(CFS) =      38.68
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   693.88  DOWNSTREAM(FEET) =   645.69
  FLOW LENGTH(FEET) =  1068.98   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.43
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      38.68
  PIPE TRAVEL TIME(MIN.) =   1.08    Tc(MIN.) =   16.46
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13105.00 =    4271.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.46
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.28      0.50     0.867     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
  SUBAREA AREA(ACRES) =   35.28      SUBAREA RUNOFF(CFS) =   22.75
  EFFECTIVE AREA(ACRES) =     92.54   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =       92.5       PEAK FLOW RATE(CFS) =      59.42

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.69  DOWNSTREAM(FEET) =   608.48
  FLOW LENGTH(FEET) =  1127.55   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  18.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.40
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      59.42
  PIPE TRAVEL TIME(MIN.) =   1.15    Tc(MIN.) =   17.61
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.61
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.109
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       37.68      0.50      0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  SUBAREA AREA(ACRES) =   37.68      SUBAREA RUNOFF(CFS) =   22.53
  EFFECTIVE AREA(ACRES) =    130.22   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =      130.2       PEAK FLOW RATE(CFS) =      78.51

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S30.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      497.26   41.52  0.50( 0.40) 0.81    1990.5   13000.00
      2      455.27   44.81  0.50( 0.40) 0.81    2016.1   13010.00
    TOTAL AREA(ACRES) =     2016.1

****************************************************************************
  FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      497.26   41.52  0.50( 0.40) 0.81    1990.5   13000.00
      2      455.27   44.81  0.50( 0.40) 0.81    2016.1   13010.00
    TOTAL AREA(ACRES) =      2016.1

****************************************************************************
  FLOW PROCESS FROM NODE  13026.00 TO NODE  13106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    662.66  DOWNSTREAM(FEET) =    608.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3098.88   CHANNEL SLOPE =  0.0175
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.639
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       75.28      0.50      0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     506.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.15
  AVERAGE FLOW DEPTH(FEET) =   4.08   TRAVEL TIME(MIN.) =   5.09
  Tc(MIN.) =   46.61
  SUBAREA AREA(ACRES) =    75.28       SUBAREA RUNOFF(CFS) =   17.69
  EFFECTIVE AREA(ACRES) =   2065.81     AREA-AVERAGED Fm(INCH/HR) =   0.40
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     2091.4          PEAK FLOW RATE(CFS) =     497.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.05   FLOW VELOCITY(FEET/SEC.) =  10.11
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      497.26   46.61    0.639  0.50( 0.40) 0.80    2065.8   13000.00
      2      455.27   50.00    0.611  0.50( 0.40) 0.80    2091.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       78.51   17.61    1.109  0.50( 0.44) 0.88     130.2   13100.00
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      575.77   17.61    1.109  0.50( 0.41) 0.81     910.7   13100.00
      2      520.65   46.61    0.639  0.50( 0.40) 0.81    2196.0   13000.00
      3      475.41   50.00    0.611  0.50( 0.40) 0.81    2221.6   13010.00
    TOTAL AREA(ACRES) =      2221.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      575.77  Tc(MIN.) =   17.610
  EFFECTIVE AREA(ACRES) =    910.66  AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     2221.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13106.00 TO NODE  13107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    608.48  DOWNSTREAM(FEET) =    584.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1650.20   CHANNEL SLOPE =  0.0147
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
```

```
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.015
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      190.45      0.50     0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     630.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.05
  AVERAGE FLOW DEPTH(FEET) =   4.57   TRAVEL TIME(MIN.) =   2.74
  Tc(MIN.) =   20.35
  SUBAREA AREA(ACRES) =   190.45       SUBAREA RUNOFF(CFS) =  109.18
  EFFECTIVE AREA(ACRES) =   1101.11     AREA-AVERAGED Fm(INCH/HR) =   0.40
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     2412.1         PEAK FLOW RATE(CFS) =     606.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.51   FLOW VELOCITY(FEET/SEC.) =   9.96
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13107.00 =   20924.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13107.00 TO NODE  13108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.29  DOWNSTREAM(FEET) =    563.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1061.67   CHANNEL SLOPE =  0.0193
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.977
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      314.12      0.50     0.939     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.939
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     678.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.34
  AVERAGE FLOW DEPTH(FEET) =   4.47   TRAVEL TIME(MIN.) =   1.56
  Tc(MIN.) =   21.91
  SUBAREA AREA(ACRES) =   314.12       SUBAREA RUNOFF(CFS) =  143.38
  EFFECTIVE AREA(ACRES) =   1415.23     AREA-AVERAGED Fm(INCH/HR) =   0.42
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     2726.2         PEAK FLOW RATE(CFS) =     712.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.54   FLOW VELOCITY(FEET/SEC.) =  11.51
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13108.00 =   21986.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13108.00 TO NODE  13109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    563.78  DOWNSTREAM(FEET) =    541.61
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1657.28   CHANNEL SLOPE =  0.0134
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.911
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      203.63      0.50     0.785     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.785
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     760.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.17
  AVERAGE FLOW DEPTH(FEET) =   4.99   TRAVEL TIME(MIN.) =   2.72
  Tc(MIN.) =   24.62
  SUBAREA AREA(ACRES) =   203.63       SUBAREA RUNOFF(CFS) =   95.02
  EFFECTIVE AREA(ACRES) =   1618.86     AREA-AVERAGED Fm(INCH/HR) =   0.41
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     2929.8         PEAK FLOW RATE(CFS) =     724.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.90   FLOW VELOCITY(FEET/SEC.) =  10.05
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13109.00 =   23643.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13109.00 TO NODE  13110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    541.61  DOWNSTREAM(FEET) =    509.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2016.96   CHANNEL SLOPE =  0.0157
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.861
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      283.06      0.50     0.791     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.791
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     783.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.90
  AVERAGE FLOW DEPTH(FEET) =   4.90   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   27.71
  SUBAREA AREA(ACRES) =   283.06       SUBAREA RUNOFF(CFS) =  118.51
  EFFECTIVE AREA(ACRES) =   1901.92     AREA-AVERAGED Fm(INCH/HR) =   0.41
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     3212.9         PEAK FLOW RATE(CFS) =     769.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.86   FLOW VELOCITY(FEET/SEC.) =  10.84
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13110.00 =   25660.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13110.00 TO NODE  13111.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    509.94  DOWNSTREAM(FEET) =    461.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3058.95   CHANNEL SLOPE =  0.0160
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.795
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      248.05      0.50     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     814.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.06
  AVERAGE FLOW DEPTH(FEET) =   4.95   TRAVEL TIME(MIN.) =   4.61
  Tc(MIN.) =   32.32
  SUBAREA AREA(ACRES) =   248.05       SUBAREA RUNOFF(CFS) =   90.08
  EFFECTIVE AREA(ACRES) =   2149.97     AREA-AVERAGED Fm(INCH/HR) =   0.41
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     3460.9         PEAK FLOW RATE(CFS) =     769.41
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.85   FLOW VELOCITY(FEET/SEC.) =  10.91
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13111.00 =   28719.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13111.00 TO NODE  13112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    461.07  DOWNSTREAM(FEET) =    452.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1781.78   CHANNEL SLOPE =  0.0047
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.738
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      179.91      0.50     0.694     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.694
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     801.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.95
  AVERAGE FLOW DEPTH(FEET) =   6.20   TRAVEL TIME(MIN.) =   4.27
  Tc(MIN.) =   36.59
  SUBAREA AREA(ACRES) =   179.91       SUBAREA RUNOFF(CFS) =   63.34
  EFFECTIVE AREA(ACRES) =   2329.88     AREA-AVERAGED Fm(INCH/HR) =   0.40
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3640.9         PEAK FLOW RATE(CFS) =     769.41
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.11   FLOW VELOCITY(FEET/SEC.) =   6.87
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13112.00 =   30501.48 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    452.77  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1625.01   CHANNEL SLOPE =  0.0155
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.705
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      155.96      0.50     0.836     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.836
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     789.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.86
  AVERAGE FLOW DEPTH(FEET) =   4.92   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   39.09
  SUBAREA AREA(ACRES) =   155.96       SUBAREA RUNOFF(CFS) =   40.28
  EFFECTIVE AREA(ACRES) =   2485.84     AREA-AVERAGED Fm(INCH/HR) =   0.41
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3796.8         PEAK FLOW RATE(CFS) =     769.41
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.87   FLOW VELOCITY(FEET/SEC.) =  10.80
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3796.8  TC(MIN.) =     39.09
  EFFECTIVE AREA(ACRES) =   2485.84  AREA-AVERAGED Fm(INCH/HR)=  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.810
  PEAK FLOW RATE(CFS)   =     769.41

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      769.41   39.09    0.705  0.50( 0.41) 0.81    2485.8   13100.00
      2      520.65   70.06    0.510  0.50( 0.40) 0.81    3771.2   13000.00
      3      475.41   73.99    0.496  0.50( 0.40) 0.81    3796.8   13010.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S32.DAT
  TIME/DATE OF STUDY: 07:23 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.184
   2)   10.00;  1.510
   3)   15.00;  1.203
   4)   20.00;  1.023
   5)   25.00;  0.902
   6)   30.00;  0.826
   7)   40.00;  0.693
   8)   50.00;  0.611
   9)   60.00;  0.546
  10)   90.00;  0.439
  11)  120.00;  0.374
  12)  180.00;  0.306
  13)  360.00;  0.211
  14) 1440.00;  0.088
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13200.00 TO NODE  13201.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.57
  ELEVATION DATA: UPSTREAM(FEET) =   1069.04  DOWNSTREAM(FEET) =   1005.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.410
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.590
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.67      0.50     1.000     0    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      0.66

**************************************************************************
  FLOW PROCESS FROM NODE  13201.00 TO NODE  13202.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.76  DOWNSTREAM(FEET) =    896.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   747.55   CHANNEL SLOPE =  0.1455
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.347
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.41      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.85
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   3.24
  Tc(MIN.) =   12.65
  SUBAREA AREA(ACRES) =     7.41       SUBAREA RUNOFF(CFS) =    5.65
  EFFECTIVE AREA(ACRES) =      8.08     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.1         PEAK FLOW RATE(CFS) =       6.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   4.42
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13202.00 =    1046.12 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   896.98  DOWNSTREAM(FEET) =   840.27
  FLOW LENGTH(FEET) =  1789.59   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   5.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.53
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.16
  PIPE TRAVEL TIME(MIN.) =   3.50    Tc(MIN.) =   16.15
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13203.00 =    2835.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.15
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.162
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.89      0.50     0.731     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.731
  SUBAREA AREA(ACRES) =   38.89      SUBAREA RUNOFF(CFS) =   27.87
  EFFECTIVE AREA(ACRES) =     46.97   AREA-AVERAGED Fm(INCH/HR) =  0.39
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.78
  TOTAL AREA(ACRES) =       47.0       PEAK FLOW RATE(CFS) =      32.68

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   840.27  DOWNSTREAM(FEET) =   782.97
  FLOW LENGTH(FEET) =   992.54   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  11.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.14
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      32.68
  PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =   17.11
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13204.00 =    3828.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.11
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.127
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.09      0.50     0.645     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.645
  SUBAREA AREA(ACRES) =   83.09      SUBAREA RUNOFF(CFS) =   60.15
```



```
  EFFECTIVE AREA(ACRES) =    130.06   AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      130.1       PEAK FLOW RATE(CFS) =      91.36

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   782.97  DOWNSTREAM(FEET) =   692.52
  FLOW LENGTH(FEET) =  2046.57   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  21.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.28
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      91.36
  PIPE TRAVEL TIME(MIN.) =   1.68    Tc(MIN.) =   18.79
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13205.00 =    5874.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.79
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.066
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       88.51      0.50     0.679     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.679
  SUBAREA AREA(ACRES) =   88.51      SUBAREA RUNOFF(CFS) =   57.90
  EFFECTIVE AREA(ACRES) =    218.57   AREA-AVERAGED Fm(INCH/HR) =  0.34
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      218.6       PEAK FLOW RATE(CFS) =     142.17

****************************************************************************
  FLOW PROCESS FROM NODE  13205.00 TO NODE  13206.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    692.52  DOWNSTREAM(FEET) =    605.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2704.69   CHANNEL SLOPE =  0.0323
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.915
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      163.73      0.50     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     178.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.93
  AVERAGE FLOW DEPTH(FEET) =   2.74   TRAVEL TIME(MIN.) =   5.68
```

```
  Tc(MIN.) =   24.47
  SUBAREA AREA(ACRES) =   163.73       SUBAREA RUNOFF(CFS) =   71.55
  EFFECTIVE AREA(ACRES) =    382.30     AREA-AVERAGED Fm(INCH/HR) =   0.38
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.76
  TOTAL AREA(ACRES) =      382.3         PEAK FLOW RATE(CFS) =     183.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.77   FLOW VELOCITY(FEET/SEC.) =   8.01
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13206.00 =    8579.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13206.00 TO NODE  13207.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.24  DOWNSTREAM(FEET) =    555.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2479.15   CHANNEL SLOPE =  0.0201
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.820
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      143.41      0.50     0.888     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.888
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     208.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.91
  AVERAGE FLOW DEPTH(FEET) =   3.17   TRAVEL TIME(MIN.) =   5.98
  Tc(MIN.) =   30.45
  SUBAREA AREA(ACRES) =   143.41       SUBAREA RUNOFF(CFS) =   48.50
  EFFECTIVE AREA(ACRES) =    525.71     AREA-AVERAGED Fm(INCH/HR) =   0.40
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      525.7         PEAK FLOW RATE(CFS) =     199.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.12   FLOW VELOCITY(FEET/SEC.) =   6.85
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13207.00 =   11058.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    555.41  DOWNSTREAM(FEET) =    505.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1734.55   CHANNEL SLOPE =  0.0287
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.772
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.56      0.50     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     218.84
```



```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.01
  AVERAGE FLOW DEPTH(FEET) =   3.02   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =   34.06
  SUBAREA AREA(ACRES) =   123.56       SUBAREA RUNOFF(CFS) =   38.12
  EFFECTIVE AREA(ACRES) =    649.27     AREA-AVERAGED Fm(INCH/HR) =   0.40
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      649.3         PEAK FLOW RATE(CFS) =     215.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.00   FLOW VELOCITY(FEET/SEC.) =   7.96
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.06
  RAINFALL INTENSITY(INCH/HR) =   0.77
  AREA-AVERAGED Fm(INCH/HR) =  0.40
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.81
  EFFECTIVE STREAM AREA(ACRES) =     649.27
  TOTAL STREAM AREA(ACRES) =     649.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     215.16

****************************************************************************
  FLOW PROCESS FROM NODE  13210.00 TO NODE  13211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   314.51
  ELEVATION DATA: UPSTREAM(FEET) =    949.80  DOWNSTREAM(FEET) =    828.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.525
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.709
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"               -        1.96      0.50     1.000     0    8.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.13
  TOTAL AREA(ACRES) =      1.96   PEAK FLOW RATE(CFS) =      2.13

****************************************************************************
  FLOW PROCESS FROM NODE  13211.00 TO NODE  13212.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    828.64  DOWNSTREAM(FEET) =    767.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   652.49   CHANNEL SLOPE =  0.0930
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  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.429
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.95      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.90
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   11.31
  SUBAREA AREA(ACRES) =    11.95       SUBAREA RUNOFF(CFS) =    9.99
  EFFECTIVE AREA(ACRES) =     13.91     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.9         PEAK FLOW RATE(CFS) =      11.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.94   FLOW VELOCITY(FEET/SEC.) =   4.43
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13212.00 =     967.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13212.00 TO NODE  13213.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    767.94  DOWNSTREAM(FEET) =    706.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.91   CHANNEL SLOPE =  0.0635
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.204
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.07      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.39
  AVERAGE FLOW DEPTH(FEET) =   1.24   TRAVEL TIME(MIN.) =   3.67
  Tc(MIN.) =   14.98
  SUBAREA AREA(ACRES) =    27.07       SUBAREA RUNOFF(CFS) =   17.15
  EFFECTIVE AREA(ACRES) =     40.98     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.0         PEAK FLOW RATE(CFS) =      25.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =   4.67
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13213.00 =    1934.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13213.00 TO NODE  13214.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    706.43  DOWNSTREAM(FEET) =    659.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.11   CHANNEL SLOPE =  0.0497
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.076
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.09      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.45
  AVERAGE FLOW DEPTH(FEET) =   1.52   TRAVEL TIME(MIN.) =   3.55
  Tc(MIN.) =   18.54
  SUBAREA AREA(ACRES) =    18.09       SUBAREA RUNOFF(CFS) =    9.37
  EFFECTIVE AREA(ACRES) =     59.07     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       59.1         PEAK FLOW RATE(CFS) =      30.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.52   FLOW VELOCITY(FEET/SEC.) =   4.44
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13214.00 =    2883.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13214.00 TO NODE  13215.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    659.31  DOWNSTREAM(FEET) =    628.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   970.24   CHANNEL SLOPE =  0.0313
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.963
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       71.42      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.12
  AVERAGE FLOW DEPTH(FEET) =   1.92   TRAVEL TIME(MIN.) =   3.93
  Tc(MIN.) =   22.46
  SUBAREA AREA(ACRES) =    71.42       SUBAREA RUNOFF(CFS) =   29.77
  EFFECTIVE AREA(ACRES) =    130.49     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      130.5         PEAK FLOW RATE(CFS) =      54.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.05   FLOW VELOCITY(FEET/SEC.) =   4.32
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13215.00 =    3853.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13215.00 TO NODE  13216.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    628.91  DOWNSTREAM(FEET) =    598.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =   922.63   CHANNEL SLOPE =  0.0331
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.889
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.33      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.51
  AVERAGE FLOW DEPTH(FEET) =   2.12   TRAVEL TIME(MIN.) =   3.41
  Tc(MIN.) =   25.87
  SUBAREA AREA(ACRES) =    36.33       SUBAREA RUNOFF(CFS) =   12.71
  EFFECTIVE AREA(ACRES) =    166.82     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      166.8         PEAK FLOW RATE(CFS) =      58.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.09   FLOW VELOCITY(FEET/SEC.) =   4.47
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13216.00 =    4775.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13216.00 TO NODE  13217.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    598.39  DOWNSTREAM(FEET) =    568.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   636.40   CHANNEL SLOPE =  0.0470
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.858
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       42.51      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.25
  AVERAGE FLOW DEPTH(FEET) =   2.03   TRAVEL TIME(MIN.) =   2.02
  Tc(MIN.) =   27.89
  SUBAREA AREA(ACRES) =    42.51       SUBAREA RUNOFF(CFS) =   13.69
  EFFECTIVE AREA(ACRES) =    209.33     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      209.3         PEAK FLOW RATE(CFS) =      67.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.06   FLOW VELOCITY(FEET/SEC.) =   5.28
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13217.00 =    5412.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =  51
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    568.48  DOWNSTREAM(FEET) =    505.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.50   CHANNEL SLOPE =  0.0331
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.766
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.24      0.50     0.951     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.79
  AVERAGE FLOW DEPTH(FEET) =   2.31   TRAVEL TIME(MIN.) =   6.60
  Tc(MIN.) =   34.48
  SUBAREA AREA(ACRES) =    73.24       SUBAREA RUNOFF(CFS) =   19.16
  EFFECTIVE AREA(ACRES) =    282.57     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      282.6         PEAK FLOW RATE(CFS) =      69.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.22   FLOW VELOCITY(FEET/SEC.) =   4.67
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13220.00 =    7308.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.48
  RAINFALL INTENSITY(INCH/HR) =   0.77
  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     282.57
  TOTAL STREAM AREA(ACRES) =     282.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      69.30

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      215.16   34.06    0.772  0.50( 0.40) 0.81     649.3   13200.00
      2       69.30   34.48    0.766  0.50( 0.49) 0.99     282.6   13210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      284.46   34.06    0.772  0.50( 0.43) 0.86     928.4   13200.00
```

```
     2      281.20   34.48    0.766  0.50( 0.43) 0.86     931.8   13210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     284.46    Tc(MIN.) =    34.06
  EFFECTIVE AREA(ACRES) =     928.40   AREA-AVERAGED Fm(INCH/HR) =  0.43
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      931.8
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13220.00 TO NODE  13221.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    505.65  DOWNSTREAM(FEET) =    478.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1949.14   CHANNEL SLOPE =  0.0137
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.719
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      108.50      0.50     0.637     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.637
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     304.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.17
  AVERAGE FLOW DEPTH(FEET) =   3.52   TRAVEL TIME(MIN.) =   3.98
  Tc(MIN.) =   38.04
  SUBAREA AREA(ACRES) =   108.50       SUBAREA RUNOFF(CFS) =   39.10
  EFFECTIVE AREA(ACRES) =   1036.90     AREA-AVERAGED Fm(INCH/HR) =   0.42
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     1040.3         PEAK FLOW RATE(CFS) =     284.46
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.44   FLOW VELOCITY(FEET/SEC.) =   8.03
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13221.00 =   14742.35 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    478.94  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2078.70   CHANNEL SLOPE =  0.0247
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.681
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.26      0.50     0.699     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.699
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     297.48
```



```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.15
  AVERAGE FLOW DEPTH(FEET) =   3.13   TRAVEL TIME(MIN.) =   3.41
  Tc(MIN.) =   41.45
  SUBAREA AREA(ACRES) =    87.26       SUBAREA RUNOFF(CFS) =   26.03
  EFFECTIVE AREA(ACRES) =   1124.16     AREA-AVERAGED Fm(INCH/HR) =   0.41
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     1127.6         PEAK FLOW RATE(CFS) =     284.46
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.08   FLOW VELOCITY(FEET/SEC.) =  10.01
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     1127.6  TC(MIN.) =     41.45
  EFFECTIVE AREA(ACRES) =   1124.16  AREA-AVERAGED Fm(INCH/HR)=  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.827
  PEAK FLOW RATE(CFS)   =     284.46

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      284.46   41.45    0.681  0.50( 0.41) 0.83    1124.2   13200.00
      2      281.20   41.90    0.677  0.50( 0.41) 0.83    1127.6   13210.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

 ------------------------------------------------------------------------
  FILE NAME: S33.DAT
  TIME/DATE OF STUDY: 08:27 07/16/2018
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.641
   2)   10.00;  1.761
   3)   15.00;  1.304
   4)   20.00;  1.115
   5)   25.00;  0.973
   6)   30.00;  0.875
   7)   40.00;  0.747
   8)   50.00;  0.665
   9)   60.00;  0.603
  10)   90.00;  0.500
  11)  120.00;  0.441
  12)  180.00;  0.369
  13)  360.00;  0.271
  14) 1200.00;  0.119
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE = 15.1
 ------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
 ========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S31.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      769.41   39.09  0.50( 0.41) 0.81    2485.8   13100.00
      2      520.65   70.06  0.50( 0.40) 0.81    3771.2   13000.00
      3      475.41   73.99  0.50( 0.40) 0.81    3796.8   13010.00
    TOTAL AREA(ACRES) =     3796.8

 ************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 15.1
 ------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
 ========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S32.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      284.46   41.45  0.50( 0.41) 0.83    1124.2   13200.00
      2      281.20   41.90  0.50( 0.41) 0.83    1127.6   13210.00
    TOTAL AREA(ACRES) =     1127.6

 ************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 14.0
 ------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
 ========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      284.46   41.45  0.50( 0.41) 0.83    1124.2   13200.00
      2      281.20   41.90  0.50( 0.41) 0.83    1127.6   13210.00
    TOTAL AREA(ACRES) =      1127.6

 ************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  11
 ------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
 ========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      284.46   41.45    0.735  0.50( 0.41) 0.83    1124.2   13200.00
      2      281.20   41.90    0.731  0.50( 0.41) 0.83    1127.6   13210.00
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      769.41   39.09    0.759  0.50( 0.41) 0.81    2485.8   13100.00
      2      520.65   70.06    0.568  0.50( 0.40) 0.81    3771.2   13000.00
```

```
      3      475.41   73.99    0.555  0.50( 0.40) 0.81    3796.8   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1053.87   39.09    0.759  0.50( 0.41) 0.82    3545.8   13100.00
      2     1034.86   41.45    0.735  0.50( 0.41) 0.82    3708.2   13200.00
      3     1027.99   41.90    0.731  0.50( 0.41) 0.82    3730.4   13210.00
      4      657.55   70.06    0.568  0.50( 0.41) 0.81    4898.8   13000.00
      5      600.32   73.99    0.555  0.50( 0.41) 0.81    4924.4   13010.00
    TOTAL AREA(ACRES) =      4924.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1053.87  Tc(MIN.) =   39.087
  EFFECTIVE AREA(ACRES) =   3545.82  AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4924.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13223.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    416.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   864.00   CHANNEL SLOPE =  0.0129
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1053.87
  FLOW VELOCITY(FEET/SEC.) =   8.77   FLOW DEPTH(FEET) =   6.33
  TRAVEL TIME(MIN.) =   1.64   Tc(MIN.) =   40.73
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1063.66   40.73    0.741  0.50( 0.41) 0.82    3545.8   13100.00
      2     1047.43   43.11    0.722  0.50( 0.41) 0.82    3708.2   13200.00
      3     1041.11   43.55    0.718  0.50( 0.41) 0.82    3730.4   13210.00
      4      686.77   71.90    0.562  0.50( 0.41) 0.81    4898.8   13000.00
      5      630.34   75.88    0.548  0.50( 0.41) 0.81    4924.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1063.66  Tc(MIN.) =   40.73
  AREA-AVERAGED Fm(INCH/HR) =  0.41  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    3545.82

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
```



```
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610301U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       25.57   13.18  0.50( 0.50) 1.00      29.3   30100.00
      2       20.45   16.00  0.50( 0.50) 1.00      29.7   30110.00
    TOTAL AREA(ACRES) =       29.7

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1063.66   40.73    0.741  0.50( 0.41) 0.82    3545.8   13100.00
      2     1047.43   43.11    0.722  0.50( 0.41) 0.82    3708.2   13200.00
      3     1041.11   43.55    0.718  0.50( 0.41) 0.82    3730.4   13210.00
      4      686.77   71.90    0.562  0.50( 0.41) 0.81    4898.8   13000.00
      5      630.34   75.88    0.548  0.50( 0.41) 0.81    4924.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       25.57   13.18    1.471  0.50( 0.50) 1.00      29.3   30100.00
      2       20.45   16.00    1.266  0.50( 0.50) 1.00      29.7   30110.00
  LONGEST FLOWPATH FROM NODE  30110.00 TO NODE  13223.00 =    2058.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1089.23   13.18    1.471  0.50( 0.41) 0.82    1176.4   30100.00
      2     1084.11   16.00    1.266  0.50( 0.41) 0.82    1422.6   30110.00
      3     1070.09   40.73    0.741  0.50( 0.41) 0.82    3575.5   13100.00
      4     1053.34   43.11    0.722  0.50( 0.41) 0.82    3737.9   13200.00
      5     1046.92   43.55    0.718  0.50( 0.41) 0.82    3760.0   13210.00
      6      688.42   71.90    0.562  0.50( 0.41) 0.81    4928.5   13000.00
      7      631.63   75.88    0.548  0.50( 0.41) 0.81    4954.1   13010.00
    TOTAL AREA(ACRES) =      4954.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1089.23  Tc(MIN.) =   13.176
  EFFECTIVE AREA(ACRES) =   1176.37  AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4954.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13224.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    416.40  DOWNSTREAM(FEET) =    410.60
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   408.51   CHANNEL SLOPE =  0.0142
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1089.23
  FLOW VELOCITY(FEET/SEC.) =   9.17   FLOW DEPTH(FEET) =   6.29
  TRAVEL TIME(MIN.) =   0.74   Tc(MIN.) =   13.92
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1089.23   13.92    1.403  0.50( 0.41) 0.82    1176.4   30100.00
      2     1084.11   16.74    1.238  0.50( 0.41) 0.82    1422.6   30110.00
      3     1070.09   41.47    0.735  0.50( 0.41) 0.82    3575.5   13100.00
      4     1053.34   43.85    0.715  0.50( 0.41) 0.82    3737.9   13200.00
      5     1046.92   44.30    0.712  0.50( 0.41) 0.82    3760.0   13210.00
      6      688.42   72.74    0.559  0.50( 0.41) 0.81    4928.5   13000.00
      7      631.63   76.74    0.546  0.50( 0.41) 0.81    4954.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1089.23  Tc(MIN.) =   13.92
  AREA-AVERAGED Fm(INCH/HR) =  0.41  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    1176.37

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610302U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       12.54   10.99  0.50( 0.50) 1.00      11.9   30210.00
      2       12.34   11.32  0.50( 0.50) 1.00      12.0   30200.00
    TOTAL AREA(ACRES) =       12.0

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1089.23   13.92    1.403  0.50( 0.41) 0.82    1176.4   30100.00
      2     1084.11   16.74    1.238  0.50( 0.41) 0.82    1422.6   30110.00
      3     1070.09   41.47    0.735  0.50( 0.41) 0.82    3575.5   13100.00
      4     1053.34   43.85    0.715  0.50( 0.41) 0.82    3737.9   13200.00
      5     1046.92   44.30    0.712  0.50( 0.41) 0.82    3760.0   13210.00
      6      688.42   72.74    0.559  0.50( 0.41) 0.81    4928.5   13000.00
      7      631.63   76.74    0.546  0.50( 0.41) 0.81    4954.1   13010.00
```



```
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       12.54   10.99    1.670  0.50( 0.50) 1.00      11.9   30210.00
      2       12.34   11.32    1.640  0.50( 0.50) 1.00      12.0   30200.00
  LONGEST FLOWPATH FROM NODE  30200.00 TO NODE  13224.00 =    1209.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1101.78   10.99    1.670  0.50( 0.41) 0.82     941.1   30210.00
      2     1101.57   11.32    1.640  0.50( 0.41) 0.82     969.1   30200.00
      3     1099.00   13.92    1.403  0.50( 0.41) 0.82    1188.4   30100.00
      4     1092.10   16.74    1.238  0.50( 0.41) 0.82    1434.7   30110.00
      5     1072.63   41.47    0.735  0.50( 0.41) 0.82    3587.5   13100.00
      6     1055.67   43.85    0.715  0.50( 0.41) 0.82    3750.0   13200.00
      7     1049.21   44.30    0.712  0.50( 0.41) 0.82    3772.1   13210.00
      8      689.06   72.74    0.559  0.50( 0.41) 0.81    4940.5   13000.00
      9      632.12   76.74    0.546  0.50( 0.41) 0.81    4966.1   13010.00
    TOTAL AREA(ACRES) =      4966.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1101.78  Tc(MIN.) =   10.993
  EFFECTIVE AREA(ACRES) =    941.07  AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4966.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13301.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    410.60  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.70   CHANNEL SLOPE =  0.0227
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.496
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.66      0.50      0.998     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1129.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.03
  AVERAGE FLOW DEPTH(FEET) =   5.84   TRAVEL TIME(MIN.) =   1.90
  Tc(MIN.) =   12.90
  SUBAREA AREA(ACRES) =    61.66       SUBAREA RUNOFF(CFS) =   55.33
  EFFECTIVE AREA(ACRES) =   1002.73     AREA-AVERAGED Fm(INCH/HR) =   0.42
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     5027.8         PEAK FLOW RATE(CFS) =    1101.78
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
 DEPTH(FEET) =  5.79   FLOW VELOCITY(FEET/SEC.) =  10.97
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.70 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1101.78   12.90    1.496  0.50( 0.42) 0.83    1002.7   30210.00
     2     1101.57   13.23    1.466  0.50( 0.42) 0.83    1030.8   30200.00
     3     1099.00   15.83    1.273  0.50( 0.42) 0.83    1250.1   30100.00
     4     1092.10   18.66    1.166  0.50( 0.41) 0.83    1496.3   30110.00
     5     1072.63   43.40    0.719  0.50( 0.41) 0.82    3649.2   13100.00
     6     1055.67   45.79    0.700  0.50( 0.41) 0.82    3811.6   13200.00
     7     1049.21   46.24    0.696  0.50( 0.41) 0.82    3833.7   13210.00
     8      689.06   74.89    0.552  0.50( 0.41) 0.82    5002.2   13000.00
     9      632.12   78.94    0.538  0.50( 0.41) 0.82    5027.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1101.78  Tc(MIN.) =   12.90
 AREA-AVERAGED Fm(INCH/HR) =  0.42  AREA-AVERAGED Fp(INCH/HR) =  0.50
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =    1002.73

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610303U.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       78.52   24.03  0.50( 0.50) 1.00     166.2   30300.00
   TOTAL AREA(ACRES) =      166.2

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1101.78   12.90    1.496  0.50( 0.42) 0.83    1002.7   30210.00
     2     1101.57   13.23    1.466  0.50( 0.42) 0.83    1030.8   30200.00
     3     1099.00   15.83    1.273  0.50( 0.42) 0.83    1250.1   30100.00
     4     1092.10   18.66    1.166  0.50( 0.41) 0.83    1496.3   30110.00
     5     1072.63   43.40    0.719  0.50( 0.41) 0.82    3649.2   13100.00
     6     1055.67   45.79    0.700  0.50( 0.41) 0.82    3811.6   13200.00
     7     1049.21   46.24    0.696  0.50( 0.41) 0.82    3833.7   13210.00
     8      689.06   74.89    0.552  0.50( 0.41) 0.82    5002.2   13000.00
     9      632.12   78.94    0.538  0.50( 0.41) 0.82    5027.8   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.70 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       78.52   24.03    1.001  0.50( 0.50) 1.00     166.2   30300.00
 LONGEST FLOWPATH FROM NODE  30300.00 TO NODE  13301.00 =    6391.00 FEET.
```



```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1180.30   12.90    1.496  0.50( 0.42) 0.85    1092.0   30210.00
     2     1180.09   13.23    1.466  0.50( 0.42) 0.85    1122.3   30200.00
     3     1177.52   15.83    1.273  0.50( 0.42) 0.84    1359.6   30100.00
     4     1170.62   18.66    1.166  0.50( 0.42) 0.84    1625.4   30110.00
     5     1166.39   24.03    1.001  0.50( 0.42) 0.84    2129.8   30300.00
     6     1106.98   43.40    0.719  0.50( 0.41) 0.83    3815.4   13100.00
     7     1086.95   45.79    0.700  0.50( 0.41) 0.83    3977.8   13200.00
     8     1079.90   46.24    0.696  0.50( 0.41) 0.83    3999.9   13210.00
     9      697.17   74.89    0.552  0.50( 0.41) 0.82    5168.4   13000.00
    10      638.05   78.94    0.538  0.50( 0.41) 0.82    5194.0   13010.00
   TOTAL AREA(ACRES) =      5194.0

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1180.30  Tc(MIN.) =   12.898
 EFFECTIVE AREA(ACRES) =   1091.96  AREA-AVERAGED Fm(INCH/HR) =  0.42
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.85
 TOTAL AREA(ACRES) =     5194.0
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.70 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13302.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    382.00  DOWNSTREAM(FEET) =    375.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1141.09   CHANNEL SLOPE =  0.0061
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.278
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        9.42      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1183.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.84
 AVERAGE FLOW DEPTH(FEET) =   7.60   TRAVEL TIME(MIN.) =   2.78
 Tc(MIN.) =   15.68
 SUBAREA AREA(ACRES) =     9.42       SUBAREA RUNOFF(CFS) =    6.60
 EFFECTIVE AREA(ACRES) =   1101.38     AREA-AVERAGED Fm(INCH/HR) =   0.42
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.85
 TOTAL AREA(ACRES) =     5203.4         PEAK FLOW RATE(CFS) =    1180.30
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.59   FLOW VELOCITY(FEET/SEC.) =   6.83
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.79 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1180.30   15.68    1.278  0.50( 0.42) 0.85    1101.4   30210.00
     2     1180.09   16.01    1.266  0.50( 0.42) 0.85    1131.7   30200.00
```

```
      3     1177.52   18.61    1.168  0.50( 0.42) 0.84    1369.0   30100.00
      4     1170.62   21.44    1.074  0.50( 0.42) 0.84    1634.8   30110.00
      5     1166.39   26.82    0.937  0.50( 0.42) 0.84    2139.2   30300.00
      6     1106.98   46.23    0.696  0.50( 0.41) 0.83    3824.8   13100.00
      7     1086.95   48.63    0.676  0.50( 0.41) 0.83    3987.3   13200.00
      8     1079.90   49.09    0.672  0.50( 0.41) 0.83    4009.4   13210.00
      9      697.17   78.06    0.541  0.50( 0.41) 0.82    5177.8   13000.00
     10      638.05   82.18    0.527  0.50( 0.41) 0.82    5203.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1180.30  Tc(MIN.) =   15.68
  AREA-AVERAGED Fm(INCH/HR) =  0.42  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.85  EFFECTIVE AREA(ACRES) =    1101.38

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13302.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610214U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       82.93   28.49  0.50( 0.50) 1.00     227.7   21400.00
    TOTAL AREA(ACRES) =      227.7

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1180.30   15.68    1.278  0.50( 0.42) 0.85    1101.4   30210.00
      2     1180.09   16.01    1.266  0.50( 0.42) 0.85    1131.7   30200.00
      3     1177.52   18.61    1.168  0.50( 0.42) 0.84    1369.0   30100.00
      4     1170.62   21.44    1.074  0.50( 0.42) 0.84    1634.8   30110.00
      5     1166.39   26.82    0.937  0.50( 0.42) 0.84    2139.2   30300.00
      6     1106.98   46.23    0.696  0.50( 0.41) 0.83    3824.8   13100.00
      7     1086.95   48.63    0.676  0.50( 0.41) 0.83    3987.3   13200.00
      8     1079.90   49.09    0.672  0.50( 0.41) 0.83    4009.4   13210.00
      9      697.17   78.06    0.541  0.50( 0.41) 0.82    5177.8   13000.00
     10      638.05   82.18    0.527  0.50( 0.41) 0.82    5203.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.79 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       82.93   28.49    0.905  0.50( 0.50) 1.00     227.7   21400.00
  LONGEST FLOWPATH FROM NODE  21400.00 TO NODE  13302.00 =    6708.00 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1263.23   15.68    1.278  0.50( 0.43) 0.86    1226.7   30210.00
      2     1263.02   16.01    1.266  0.50( 0.43) 0.86    1259.7   30200.00
      3     1260.46   18.61    1.168  0.50( 0.43) 0.86    1517.7   30100.00
      4     1253.55   21.44    1.074  0.50( 0.43) 0.86    1806.2   30110.00
      5     1249.33   26.82    0.937  0.50( 0.43) 0.85    2353.5   30300.00
      6     1244.20   28.49    0.905  0.50( 0.43) 0.85    2512.1   21400.00
      7     1147.15   46.23    0.696  0.50( 0.42) 0.84    4052.5   13100.00
      8     1123.09   48.63    0.676  0.50( 0.42) 0.84    4214.9   13200.00
      9     1115.26   49.09    0.672  0.50( 0.42) 0.84    4237.0   13210.00
     10      705.59   78.06    0.541  0.50( 0.42) 0.83    5405.5   13000.00
     11      643.58   82.18    0.527  0.50( 0.41) 0.83    5431.1   13010.00
    TOTAL AREA(ACRES) =      5431.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1263.23  Tc(MIN.) =   15.679
  EFFECTIVE AREA(ACRES) =   1226.67  AREA-AVERAGED Fm(INCH/HR) =  0.43
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =     5431.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13303.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    375.00  DOWNSTREAM(FEET) =    355.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2193.96   CHANNEL SLOPE =  0.0091
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1263.23
  FLOW VELOCITY(FEET/SEC.) =   8.06   FLOW DEPTH(FEET) =   7.23
  TRAVEL TIME(MIN.) =   4.54   Tc(MIN.) =   20.22
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1263.23   20.22    1.109  0.50( 0.43) 0.86    1226.7   30210.00
      2     1263.02   20.55    1.099  0.50( 0.43) 0.86    1259.7   30200.00
      3     1260.46   23.15    1.026  0.50( 0.43) 0.86    1517.7   30100.00
      4     1253.55   25.99    0.954  0.50( 0.43) 0.86    1806.2   30110.00
      5     1249.33   31.36    0.858  0.50( 0.43) 0.85    2353.5   30300.00
      6     1244.20   33.04    0.836  0.50( 0.43) 0.85    2512.1   21400.00
      7     1147.15   50.88    0.660  0.50( 0.42) 0.84    4052.5   13100.00
      8     1123.09   53.30    0.645  0.50( 0.42) 0.84    4214.9   13200.00
      9     1115.26   53.76    0.642  0.50( 0.42) 0.84    4237.0   13210.00
     10      705.59   83.31    0.523  0.50( 0.42) 0.83    5405.5   13000.00
     11      643.58   87.55    0.508  0.50( 0.41) 0.83    5431.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1263.23  Tc(MIN.) =   20.22
  AREA-AVERAGED Fm(INCH/HR) =  0.43  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.86  EFFECTIVE AREA(ACRES) =    1226.67

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610213U.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       63.91   17.13  0.50( 0.50) 1.00      98.2   21300.00
   TOTAL AREA(ACRES) =       98.2

****************************************************************************
 FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1263.23   20.22    1.109  0.50( 0.43) 0.86    1226.7   30210.00
     2     1263.02   20.55    1.099  0.50( 0.43) 0.86    1259.7   30200.00
     3     1260.46   23.15    1.026  0.50( 0.43) 0.86    1517.7   30100.00
     4     1253.55   25.99    0.954  0.50( 0.43) 0.86    1806.2   30110.00
     5     1249.33   31.36    0.858  0.50( 0.43) 0.85    2353.5   30300.00
     6     1244.20   33.04    0.836  0.50( 0.43) 0.85    2512.1   21400.00
     7     1147.15   50.88    0.660  0.50( 0.42) 0.84    4052.5   13100.00
     8     1123.09   53.30    0.645  0.50( 0.42) 0.84    4214.9   13200.00
     9     1115.26   53.76    0.642  0.50( 0.42) 0.84    4237.0   13210.00
    10      705.59   83.31    0.523  0.50( 0.42) 0.83    5405.5   13000.00
    11      643.58   87.55    0.508  0.50( 0.41) 0.83    5431.1   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       63.91   17.13    1.223  0.50( 0.50) 1.00      98.2   21300.00
 LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  13303.00 =    2988.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1315.55   17.13    1.223  0.50( 0.44) 0.88    1137.8   21300.00
     2     1317.02   20.22    1.109  0.50( 0.44) 0.87    1324.9   30210.00
     3     1315.98   20.55    1.099  0.50( 0.44) 0.87    1357.9   30200.00
     4     1306.89   23.15    1.026  0.50( 0.43) 0.87    1615.9   30100.00
     5     1293.62   25.99    0.954  0.50( 0.43) 0.86    1904.4   30110.00
     6     1280.90   31.36    0.858  0.50( 0.43) 0.86    2451.7   30300.00
     7     1273.89   33.04    0.836  0.50( 0.43) 0.86    2610.4   21400.00
     8     1161.23   50.88    0.660  0.50( 0.42) 0.84    4150.7   13100.00
     9     1135.85   53.30    0.645  0.50( 0.42) 0.84    4313.1   13200.00
    10     1127.76   53.76    0.642  0.50( 0.42) 0.84    4335.2   13210.00
```



```
    11      707.61   83.31    0.523  0.50( 0.42) 0.83    5503.7   13000.00
    12      644.30   87.55    0.508  0.50( 0.42) 0.83    5529.3   13010.00
  TOTAL AREA(ACRES) =      5529.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1317.02  Tc(MIN.) =   20.216
 EFFECTIVE AREA(ACRES) =   1324.89  AREA-AVERAGED Fm(INCH/HR) =  0.44
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.88
 TOTAL AREA(ACRES) =     5529.3
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13303.00 TO NODE  13304.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    355.00  DOWNSTREAM(FEET) =    350.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   925.40   CHANNEL SLOPE =  0.0054
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.043
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       13.84      0.50     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1320.40
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.70
 AVERAGE FLOW DEPTH(FEET) =   8.11   TRAVEL TIME(MIN.) =   2.30
 Tc(MIN.) =   22.52
 SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =    6.77
 EFFECTIVE AREA(ACRES) =   1338.73     AREA-AVERAGED Fm(INCH/HR) =   0.44
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.87
 TOTAL AREA(ACRES) =     5543.1          PEAK FLOW RATE(CFS) =    1317.02
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.10   FLOW VELOCITY(FEET/SEC.) =   6.70
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1315.55   19.43    1.136  0.50( 0.44) 0.88    1151.7   21300.00
     2     1317.02   22.52    1.043  0.50( 0.44) 0.87    1338.7   30210.00
     3     1315.98   22.85    1.034  0.50( 0.44) 0.87    1371.7   30200.00
     4     1306.89   25.45    0.964  0.50( 0.44) 0.87    1629.8   30100.00
     5     1293.62   28.30    0.908  0.50( 0.43) 0.87    1918.2   30110.00
     6     1280.90   33.68    0.828  0.50( 0.43) 0.86    2465.6   30300.00
     7     1273.89   35.36    0.806  0.50( 0.43) 0.86    2624.2   21400.00
     8     1161.23   53.25    0.645  0.50( 0.42) 0.84    4164.5   13100.00
     9     1135.85   55.69    0.630  0.50( 0.42) 0.84    4327.0   13200.00
    10     1127.76   56.16    0.627  0.50( 0.42) 0.84    4349.1   13210.00
    11      707.61   86.00    0.514  0.50( 0.42) 0.83    5517.5   13000.00
    12      644.30   90.30    0.499  0.50( 0.42) 0.83    5543.1   13010.00
 NEW PEAK FLOW DATA ARE:
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```
  PEAK FLOW RATE(CFS) =    1317.02  Tc(MIN.) =   22.52
  AREA-AVERAGED Fm(INCH/HR) =  0.44  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    1338.73

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610304U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       83.29   21.61  0.50( 0.50) 1.00     162.6   30410.00
      2       68.16   27.98  0.50( 0.50) 1.00     182.7   30400.00
    TOTAL AREA(ACRES) =      182.7

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1315.55   19.43    1.136  0.50( 0.44) 0.88    1151.7   21300.00
      2     1317.02   22.52    1.043  0.50( 0.44) 0.87    1338.7   30210.00
      3     1315.98   22.85    1.034  0.50( 0.44) 0.87    1371.7   30200.00
      4     1306.89   25.45    0.964  0.50( 0.44) 0.87    1629.8   30100.00
      5     1293.62   28.30    0.908  0.50( 0.43) 0.87    1918.2   30110.00
      6     1280.90   33.68    0.828  0.50( 0.43) 0.86    2465.6   30300.00
      7     1273.89   35.36    0.806  0.50( 0.43) 0.86    2624.2   21400.00
      8     1161.23   53.25    0.645  0.50( 0.42) 0.84    4164.5   13100.00
      9     1135.85   55.69    0.630  0.50( 0.42) 0.84    4327.0   13200.00
     10     1127.76   56.16    0.627  0.50( 0.42) 0.84    4349.1   13210.00
     11      707.61   86.00    0.514  0.50( 0.42) 0.83    5517.5   13000.00
     12      644.30   90.30    0.499  0.50( 0.42) 0.83    5543.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       83.29   21.61    1.069  0.50( 0.50) 1.00     162.6   30410.00
      2       68.16   27.98    0.915  0.50( 0.50) 1.00     182.7   30400.00
  LONGEST FLOWPATH FROM NODE  30400.00 TO NODE  13304.00 =    5899.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1398.84   19.43    1.136  0.50( 0.45) 0.89    1297.9   21300.00
      2     1399.87   21.61    1.069  0.50( 0.44) 0.89    1446.3   30410.00
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```
      3     1398.15   22.52    1.043  0.50( 0.44) 0.89    1504.2   30210.00
      4     1396.33   22.85    1.034  0.50( 0.44) 0.89    1538.2   30200.00
      5     1381.04   25.45    0.964  0.50( 0.44) 0.88    1804.5   30100.00
      6     1363.29   27.98    0.915  0.50( 0.44) 0.88    2068.3   30400.00
      7     1360.75   28.30    0.908  0.50( 0.44) 0.88    2100.9   30110.00
      8     1334.79   33.68    0.828  0.50( 0.44) 0.87    2648.3   30300.00
      9     1324.24   35.36    0.806  0.50( 0.43) 0.87    2806.9   21400.00
     10     1185.02   53.25    0.645  0.50( 0.42) 0.85    4347.2   13100.00
     11     1157.15   55.69    0.630  0.50( 0.42) 0.85    4509.7   13200.00
     12     1148.59   56.16    0.627  0.50( 0.42) 0.85    4531.8   13210.00
     13      709.83   86.00    0.514  0.50( 0.42) 0.84    5700.2   13000.00
     14      644.30   90.30    0.499  0.50( 0.42) 0.84    5725.8   13010.00
   TOTAL AREA(ACRES) =      5725.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1399.87  Tc(MIN.) =   21.611
  EFFECTIVE AREA(ACRES) =   1446.33  AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5725.8
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13305.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    350.00  DOWNSTREAM(FEET) =    315.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2966.27   CHANNEL SLOPE =  0.0118
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.933
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       27.39      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1405.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.12
  AVERAGE FLOW DEPTH(FEET) =   7.17   TRAVEL TIME(MIN.) =   5.42
  Tc(MIN.) =   27.03
  SUBAREA AREA(ACRES) =    27.39       SUBAREA RUNOFF(CFS) =   10.67
  EFFECTIVE AREA(ACRES) =   1473.72     AREA-AVERAGED Fm(INCH/HR) =   0.45
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =     5753.2         PEAK FLOW RATE(CFS) =    1399.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.15   FLOW VELOCITY(FEET/SEC.) =   9.12
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.42 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1398.84   24.86    0.977  0.50( 0.45) 0.89    1325.3   21300.00
      2     1399.87   27.03    0.933  0.50( 0.45) 0.89    1473.7   30410.00
      3     1398.15   27.94    0.915  0.50( 0.45) 0.89    1531.6   30210.00
```

```
      4     1396.33   28.27    0.909  0.50( 0.45) 0.89    1565.6   30200.00
      5     1381.04   30.89    0.864  0.50( 0.44) 0.88    1831.9   30100.00
      6     1363.29   33.43    0.831  0.50( 0.44) 0.88    2095.7   30400.00
      7     1360.75   33.75    0.827  0.50( 0.44) 0.88    2128.3   30110.00
      8     1334.79   39.17    0.758  0.50( 0.44) 0.87    2675.7   30300.00
      9     1324.24   40.86    0.740  0.50( 0.44) 0.87    2834.3   21400.00
     10     1185.02   58.90    0.610  0.50( 0.43) 0.85    4374.6   13100.00
     11     1157.15   61.38    0.598  0.50( 0.42) 0.85    4537.1   13200.00
     12     1148.59   61.86    0.597  0.50( 0.42) 0.85    4559.2   13210.00
     13      709.83   92.43    0.495  0.50( 0.42) 0.84    5727.6   13000.00
     14      644.30   96.90    0.486  0.50( 0.42) 0.84    5753.2   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1399.87  Tc(MIN.) =   27.03
  AREA-AVERAGED Fm(INCH/HR) =  0.45  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.89  EFFECTIVE AREA(ACRES) =    1473.72

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610305U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      219.84   26.73  0.50( 0.50) 1.00     537.7   30520.00
      2      213.51   28.57  0.50( 0.50) 1.00     563.6   30540.00
      3      201.19   30.30  0.50( 0.50) 1.00     575.3   30510.00
      4      186.31   32.28  0.50( 0.50) 1.00     582.8   30500.00
    TOTAL AREA(ACRES) =      582.8

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1398.84   24.86    0.977  0.50( 0.45) 0.89    1325.3   21300.00
      2     1399.87   27.03    0.933  0.50( 0.45) 0.89    1473.7   30410.00
      3     1398.15   27.94    0.915  0.50( 0.45) 0.89    1531.6   30210.00
      4     1396.33   28.27    0.909  0.50( 0.45) 0.89    1565.6   30200.00
      5     1381.04   30.89    0.864  0.50( 0.44) 0.88    1831.9   30100.00
      6     1363.29   33.43    0.831  0.50( 0.44) 0.88    2095.7   30400.00
      7     1360.75   33.75    0.827  0.50( 0.44) 0.88    2128.3   30110.00
      8     1334.79   39.17    0.758  0.50( 0.44) 0.87    2675.7   30300.00
      9     1324.24   40.86    0.740  0.50( 0.44) 0.87    2834.3   21400.00
     10     1185.02   58.90    0.610  0.50( 0.43) 0.85    4374.6   13100.00
     11     1157.15   61.38    0.598  0.50( 0.42) 0.85    4537.1   13200.00
     12     1148.59   61.86    0.597  0.50( 0.42) 0.85    4559.2   13210.00
```



```
     13      709.83   92.43    0.495  0.50( 0.42) 0.84    5727.6   13000.00
     14      644.30   96.90    0.486  0.50( 0.42) 0.84    5753.2   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.42 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      219.84   26.73    0.939  0.50( 0.50) 1.00     537.7   30520.00
      2      213.51   28.57    0.903  0.50( 0.50) 1.00     563.6   30540.00
      3      201.19   30.30    0.871  0.50( 0.50) 1.00     575.3   30510.00
      4      186.31   32.28    0.846  0.50( 0.50) 1.00     582.8   30500.00
  LONGEST FLOWPATH FROM NODE  30500.00 TO NODE  13305.00 =    9458.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1618.68   24.86    0.977  0.50( 0.46) 0.92    1825.3   21300.00
      2     1619.57   26.73    0.939  0.50( 0.46) 0.92    1990.7   30520.00
      3     1618.67   27.03    0.933  0.50( 0.46) 0.92    2015.7   30410.00
      4     1613.83   27.94    0.915  0.50( 0.46) 0.92    2086.3   30210.00
      5     1610.86   28.27    0.909  0.50( 0.46) 0.92    2125.1   30200.00
      6     1608.12   28.57    0.903  0.50( 0.46) 0.92    2159.2   30540.00
      7     1585.67   30.30    0.871  0.50( 0.46) 0.91    2347.3   30510.00
      8     1577.79   30.89    0.864  0.50( 0.46) 0.91    2409.4   30100.00
      9     1557.64   32.28    0.846  0.50( 0.45) 0.91    2559.0   30500.00
     10     1541.67   33.43    0.831  0.50( 0.45) 0.91    2678.5   30400.00
     11     1536.92   33.75    0.827  0.50( 0.45) 0.90    2711.2   30110.00
     12     1473.57   39.17    0.758  0.50( 0.45) 0.90    3258.5   30300.00
     13     1453.50   40.86    0.740  0.50( 0.45) 0.89    3417.1   21400.00
     14     1244.10   58.90    0.610  0.50( 0.43) 0.87    4957.5   13100.00
     15     1210.02   61.38    0.598  0.50( 0.43) 0.87    5119.9   13200.00
     16     1200.57   61.86    0.597  0.50( 0.43) 0.87    5142.0   13210.00
     17      709.83   92.43    0.495  0.50( 0.43) 0.85    6310.5   13000.00
     18      644.30   96.90    0.486  0.50( 0.43) 0.85    6336.1   13010.00
    TOTAL AREA(ACRES) =      6336.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1619.57  Tc(MIN.) =   26.729
  EFFECTIVE AREA(ACRES) =   1990.71  AREA-AVERAGED Fm(INCH/HR) =  0.46
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =     6336.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.20 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    315.00  DOWNSTREAM(FEET) =    284.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1317.91   CHANNEL SLOPE =  0.0235
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1619.57
  FLOW VELOCITY(FEET/SEC.) =  12.24   FLOW DEPTH(FEET) =   6.64
  TRAVEL TIME(MIN.) =   1.79   Tc(MIN.) =   28.52
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.20 =   43204.33 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1618.68	26.65	0.941	0.50(0.46)	0.92	1825.3	21300.00
2	1619.57	28.52	0.904	0.50(0.46)	0.92	1990.7	30520.00
3	1618.67	28.83	0.898	0.50(0.46)	0.92	2015.7	30410.00
4	1613.83	29.73	0.880	0.50(0.46)	0.92	2086.3	30210.00
5	1610.86	30.07	0.874	0.50(0.46)	0.92	2125.1	30200.00
6	1608.12	30.37	0.870	0.50(0.46)	0.92	2159.2	30540.00
7	1585.67	32.11	0.848	0.50(0.46)	0.91	2347.3	30510.00
8	1577.79	32.70	0.840	0.50(0.46)	0.91	2409.4	30100.00
9	1557.64	34.09	0.823	0.50(0.45)	0.91	2559.0	30500.00
10	1541.67	35.25	0.808	0.50(0.45)	0.91	2678.5	30400.00
11	1536.92	35.57	0.804	0.50(0.45)	0.90	2711.2	30110.00
12	1473.57	41.01	0.739	0.50(0.45)	0.90	3258.5	30300.00
13	1453.50	42.70	0.725	0.50(0.45)	0.89	3417.1	21400.00
14	1244.10	60.82	0.600	0.50(0.43)	0.87	4957.5	13100.00
15	1210.02	63.31	0.592	0.50(0.43)	0.87	5119.9	13200.00
16	1200.57	63.79	0.590	0.50(0.43)	0.87	5142.0	13210.00
17	709.83	94.64	0.491	0.50(0.43)	0.85	6310.5	13000.00
18	644.30	99.16	0.482	0.50(0.43)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1619.57 Tc(MIN.) = 28.52
AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.92 EFFECTIVE AREA(ACRES) = 1990.71

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610306U.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21.64	20.66	0.50(0.50)	1.00	40.4	30600.00

TOTAL AREA(ACRES) = 40.4

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1618.68	26.65	0.941	0.50(0.46)	0.92	1825.3	21300.00
2	1619.57	28.52	0.904	0.50(0.46)	0.92	1990.7	30520.00
3	1618.67	28.83	0.898	0.50(0.46)	0.92	2015.7	30410.00
4	1613.83	29.73	0.880	0.50(0.46)	0.92	2086.3	30210.00
5	1610.86	30.07	0.874	0.50(0.46)	0.92	2125.1	30200.00

6	1608.12	30.37	0.870	0.50(0.46)	0.92	2159.2	30540.00
7	1585.67	32.11	0.848	0.50(0.46)	0.91	2347.3	30510.00
8	1577.79	32.70	0.840	0.50(0.46)	0.91	2409.4	30100.00
9	1557.64	34.09	0.823	0.50(0.45)	0.91	2559.0	30500.00
10	1541.67	35.25	0.808	0.50(0.45)	0.91	2678.5	30400.00
11	1536.92	35.57	0.804	0.50(0.45)	0.90	2711.2	30110.00
12	1473.57	41.01	0.739	0.50(0.45)	0.90	3258.5	30300.00
13	1453.50	42.70	0.725	0.50(0.45)	0.89	3417.1	21400.00
14	1244.10	60.82	0.600	0.50(0.43)	0.87	4957.5	13100.00
15	1210.02	63.31	0.592	0.50(0.43)	0.87	5119.9	13200.00
16	1200.57	63.79	0.590	0.50(0.43)	0.87	5142.0	13210.00
17	709.83	94.64	0.491	0.50(0.43)	0.85	6310.5	13000.00
18	644.30	99.16	0.482	0.50(0.43)	0.85	6336.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21.64	20.66	1.096	0.50(0.50)	1.00	40.4	30600.00

LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 = 2948.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1640.32	20.66	1.096	0.50(0.46)	0.92	1455.6	30600.00
2	1634.67	26.65	0.941	0.50(0.46)	0.92	1865.6	21300.00
3	1634.23	28.52	0.904	0.50(0.46)	0.92	2031.1	30520.00
4	1633.12	28.83	0.898	0.50(0.46)	0.92	2056.0	30410.00
5	1627.63	29.73	0.880	0.50(0.46)	0.92	2126.7	30210.00
6	1624.44	30.07	0.874	0.50(0.46)	0.92	2165.4	30200.00
7	1621.56	30.37	0.870	0.50(0.46)	0.92	2199.5	30540.00
8	1598.30	32.11	0.848	0.50(0.46)	0.91	2387.6	30510.00
9	1590.15	32.70	0.840	0.50(0.46)	0.91	2449.8	30100.00
10	1569.35	34.09	0.823	0.50(0.46)	0.91	2599.4	30500.00
11	1552.84	35.25	0.808	0.50(0.45)	0.91	2718.9	30400.00
12	1547.95	35.57	0.804	0.50(0.45)	0.91	2751.5	30110.00
13	1482.23	41.01	0.739	0.50(0.45)	0.90	3298.8	30300.00
14	1461.66	42.70	0.725	0.50(0.45)	0.89	3457.5	21400.00
15	1247.73	60.82	0.600	0.50(0.43)	0.87	4997.8	13100.00
16	1213.34	63.31	0.592	0.50(0.43)	0.87	5160.3	13200.00
17	1203.83	63.79	0.590	0.50(0.43)	0.87	5182.4	13210.00
18	709.83	94.64	0.491	0.50(0.43)	0.86	6350.8	13000.00
19	644.30	99.16	0.482	0.50(0.43)	0.85	6376.4	13010.00

TOTAL AREA(ACRES) = 6376.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1640.32 Tc(MIN.) = 20.665
EFFECTIVE AREA(ACRES) = 1455.62 AREA-AVERAGED Fm(INCH/HR) = 0.46
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 6376.4
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.40 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========

ELEVATION DATA: UPSTREAM(FEET) = 284.00 DOWNSTREAM(FEET) = 274.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 826.37 CHANNEL SLOPE = 0.0121
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 1640.32
FLOW VELOCITY(FEET/SEC.) = 9.57 FLOW DEPTH(FEET) = 7.56
TRAVEL TIME(MIN.) = 1.44 Tc(MIN.) = 22.10
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1640.32	22.10	1.055	0.50(0.46)	0.92	1455.6	30600.00
2	1634.67	28.09	0.912	0.50(0.46)	0.92	1865.6	21300.00
3	1634.23	29.96	0.876	0.50(0.46)	0.92	2031.1	30520.00
4	1633.12	30.27	0.872	0.50(0.46)	0.92	2056.0	30410.00
5	1627.63	31.18	0.860	0.50(0.46)	0.92	2126.7	30210.00
6	1624.44	31.51	0.856	0.50(0.46)	0.92	2165.4	30200.00
7	1621.56	31.81	0.852	0.50(0.46)	0.92	2199.5	30540.00
8	1598.30	33.55	0.830	0.50(0.46)	0.91	2387.6	30510.00
9	1590.15	34.15	0.822	0.50(0.46)	0.91	2449.8	30100.00
10	1569.35	35.55	0.804	0.50(0.46)	0.91	2599.4	30500.00
11	1552.84	36.71	0.789	0.50(0.45)	0.91	2718.9	30400.00
12	1547.95	37.03	0.785	0.50(0.45)	0.91	2751.5	30110.00
13	1482.23	42.48	0.727	0.50(0.45)	0.90	3298.8	30300.00
14	1461.66	44.18	0.713	0.50(0.45)	0.89	3457.5	21400.00
15	1247.73	62.36	0.595	0.50(0.43)	0.87	4997.8	13100.00
16	1213.34	64.86	0.586	0.50(0.43)	0.87	5160.3	13200.00
17	1203.83	65.35	0.585	0.50(0.43)	0.87	5182.4	13210.00
18	709.83	96.41	0.487	0.50(0.43)	0.86	6350.8	13000.00
19	644.30	100.97	0.478	0.50(0.43)	0.85	6376.4	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1640.32 Tc(MIN.) = 22.10
AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.92 EFFECTIVE AREA(ACRES) = 1455.62

****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610307U.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.86	20.55	0.50(0.50)	1.00	98.0	30700.00

TOTAL AREA(ACRES) = 98.0

****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1640.32	22.10	1.055	0.50(0.46)	0.92	1455.6	30600.00
2	1634.67	28.09	0.912	0.50(0.46)	0.92	1865.6	21300.00
3	1634.23	29.96	0.876	0.50(0.46)	0.92	2031.1	30520.00
4	1633.12	30.27	0.872	0.50(0.46)	0.92	2056.0	30410.00
5	1627.63	31.18	0.860	0.50(0.46)	0.92	2126.7	30210.00
6	1624.44	31.51	0.856	0.50(0.46)	0.92	2165.4	30200.00
7	1621.56	31.81	0.852	0.50(0.46)	0.92	2199.5	30540.00
8	1598.30	33.55	0.830	0.50(0.46)	0.91	2387.6	30510.00
9	1590.15	34.15	0.822	0.50(0.46)	0.91	2449.8	30100.00
10	1569.35	35.55	0.804	0.50(0.46)	0.91	2599.4	30500.00
11	1552.84	36.71	0.789	0.50(0.45)	0.91	2718.9	30400.00
12	1547.95	37.03	0.785	0.50(0.45)	0.91	2751.5	30110.00
13	1482.23	42.48	0.727	0.50(0.45)	0.90	3298.8	30300.00
14	1461.66	44.18	0.713	0.50(0.45)	0.89	3457.5	21400.00
15	1247.73	62.36	0.595	0.50(0.43)	0.87	4997.8	13100.00
16	1213.34	64.86	0.586	0.50(0.43)	0.87	5160.3	13200.00
17	1203.83	65.35	0.585	0.50(0.43)	0.87	5182.4	13210.00
18	709.83	96.41	0.487	0.50(0.43)	0.86	6350.8	13000.00
19	644.30	100.97	0.478	0.50(0.43)	0.85	6376.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.86	20.55	1.099	0.50(0.50)	1.00	98.0	30700.00

LONGEST FLOWPATH FROM NODE 30700.00 TO NODE 13305.40 = 5192.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1691.35	20.55	1.099	0.50(0.46)	0.93	1451.2	30700.00
2	1689.28	22.10	1.055	0.50(0.46)	0.93	1553.6	30600.00
3	1671.03	28.09	0.912	0.50(0.46)	0.93	1963.6	21300.00
4	1667.35	29.96	0.876	0.50(0.46)	0.93	2129.1	30520.00
5	1665.87	30.27	0.872	0.50(0.46)	0.93	2154.0	30410.00
6	1659.36	31.18	0.860	0.50(0.46)	0.92	2224.7	30210.00
7	1655.79	31.51	0.856	0.50(0.46)	0.92	2263.4	30200.00
8	1652.58	31.81	0.852	0.50(0.46)	0.92	2297.5	30540.00
9	1627.35	33.55	0.830	0.50(0.46)	0.92	2485.6	30510.00
10	1618.52	34.15	0.822	0.50(0.46)	0.92	2547.8	30100.00
11	1596.14	35.55	0.804	0.50(0.46)	0.91	2697.4	30500.00
12	1578.33	36.71	0.789	0.50(0.46)	0.91	2816.9	30400.00
13	1573.07	37.03	0.785	0.50(0.45)	0.91	2849.5	30110.00
14	1502.21	42.48	0.727	0.50(0.45)	0.90	3396.9	30300.00
15	1480.41	44.18	0.713	0.50(0.45)	0.90	3555.5	21400.00
16	1256.08	62.36	0.595	0.50(0.44)	0.87	5095.8	13100.00
17	1220.94	64.86	0.586	0.50(0.43)	0.87	5258.3	13200.00
18	1211.28	65.35	0.585	0.50(0.43)	0.87	5280.4	13210.00
19	709.83	96.41	0.487	0.50(0.43)	0.86	6448.8	13000.00
20	644.30	100.97	0.478	0.50(0.43)	0.86	6474.4	13010.00

TOTAL AREA(ACRES) = 6474.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1691.35 Tc(MIN.) = 20.548
EFFECTIVE AREA(ACRES) = 1451.16 AREA-AVERAGED Fm(INCH/HR) = 0.46
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.86
TOTAL AREA(ACRES) = 6474.4
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.60 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 274.00 DOWNSTREAM(FEET) = 258.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 733.85 CHANNEL SLOPE = 0.0218
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 1691.35
FLOW VELOCITY(FEET/SEC.) = 12.03 FLOW DEPTH(FEET) = 6.85
TRAVEL TIME(MIN.) = 1.02 Tc(MIN.) = 21.56
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1691.35	21.56	1.071	0.50(0.46)	0.93	1451.2	30700.00
2	1689.28	23.12	1.026	0.50(0.46)	0.93	1553.6	30600.00
3	1671.03	29.11	0.892	0.50(0.46)	0.93	1963.6	21300.00
4	1667.35	30.98	0.862	0.50(0.46)	0.93	2129.1	30520.00
5	1665.87	31.29	0.859	0.50(0.46)	0.93	2154.0	30410.00
6	1659.36	32.20	0.847	0.50(0.46)	0.92	2224.7	30210.00
7	1655.79	32.53	0.843	0.50(0.46)	0.92	2263.4	30200.00
8	1652.58	32.83	0.839	0.50(0.46)	0.92	2297.5	30540.00
9	1627.35	34.58	0.816	0.50(0.46)	0.92	2485.6	30510.00
10	1618.52	35.18	0.809	0.50(0.46)	0.92	2547.8	30100.00
11	1596.14	36.58	0.791	0.50(0.46)	0.91	2697.4	30500.00
12	1578.33	37.74	0.776	0.50(0.46)	0.91	2816.9	30400.00
13	1573.07	38.07	0.772	0.50(0.45)	0.91	2849.5	30110.00
14	1502.21	43.53	0.718	0.50(0.45)	0.90	3396.9	30300.00
15	1480.41	45.23	0.704	0.50(0.45)	0.90	3555.5	21400.00
16	1256.08	63.46	0.591	0.50(0.44)	0.87	5095.8	13100.00
17	1220.94	65.96	0.583	0.50(0.43)	0.87	5258.3	13200.00
18	1211.28	66.45	0.581	0.50(0.43)	0.87	5280.4	13210.00
19	709.83	97.67	0.485	0.50(0.43)	0.86	6448.8	13000.00
20	644.30	102.27	0.476	0.50(0.43)	0.86	6474.4	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1691.35 Tc(MIN.) = 21.56
AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.93 EFFECTIVE AREA(ACRES) = 1451.16

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610308U.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	36.91	19.53	0.50(0.50)	1.00	64.8	30800.00

TOTAL AREA(ACRES) = 64.8

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1691.35	21.56	1.071	0.50(0.46)	0.93	1451.2	30700.00
2	1689.28	23.12	1.026	0.50(0.46)	0.93	1553.6	30600.00
3	1671.03	29.11	0.892	0.50(0.46)	0.93	1963.6	21300.00
4	1667.35	30.98	0.862	0.50(0.46)	0.93	2129.1	30520.00
5	1665.87	31.29	0.859	0.50(0.46)	0.93	2154.0	30410.00
6	1659.36	32.20	0.847	0.50(0.46)	0.92	2224.7	30210.00
7	1655.79	32.53	0.843	0.50(0.46)	0.92	2263.4	30200.00
8	1652.58	32.83	0.839	0.50(0.46)	0.92	2297.5	30540.00
9	1627.35	34.58	0.816	0.50(0.46)	0.92	2485.6	30510.00
10	1618.52	35.18	0.809	0.50(0.46)	0.92	2547.8	30100.00
11	1596.14	36.58	0.791	0.50(0.46)	0.91	2697.4	30500.00
12	1578.33	37.74	0.776	0.50(0.46)	0.91	2816.9	30400.00
13	1573.07	38.07	0.772	0.50(0.45)	0.91	2849.5	30110.00
14	1502.21	43.53	0.718	0.50(0.45)	0.90	3396.9	30300.00
15	1480.41	45.23	0.704	0.50(0.45)	0.90	3555.5	21400.00
16	1256.08	63.46	0.591	0.50(0.44)	0.87	5095.8	13100.00
17	1220.94	65.96	0.583	0.50(0.43)	0.87	5258.3	13200.00
18	1211.28	66.45	0.581	0.50(0.43)	0.87	5280.4	13210.00
19	709.83	97.67	0.485	0.50(0.43)	0.86	6448.8	13000.00
20	644.30	102.27	0.476	0.50(0.43)	0.86	6474.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	36.91	19.53	1.133	0.50(0.50)	1.00	64.8	30800.00

LONGEST FLOWPATH FROM NODE 30800.00 TO NODE 13305.60 = 4165.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1726.01	19.53	1.133	0.50(0.47)	0.93	1378.9	30800.00
2	1724.62	21.56	1.071	0.50(0.47)	0.93	1516.0	30700.00
3	1719.98	23.12	1.026	0.50(0.47)	0.93	1618.4	30600.00
4	1693.91	29.11	0.892	0.50(0.47)	0.93	2028.5	21300.00
5	1688.48	30.98	0.862	0.50(0.46)	0.93	2193.9	30520.00
6	1686.78	31.29	0.859	0.50(0.46)	0.93	2218.9	30410.00
7	1679.59	32.20	0.847	0.50(0.46)	0.93	2289.5	30210.00
8	1675.76	32.53	0.843	0.50(0.46)	0.93	2328.3	30200.00
9	1672.33	32.83	0.839	0.50(0.46)	0.93	2362.4	30540.00

10	1645.79	34.58	0.816	0.50(0.46)	0.92	2550.4	30510.00
11	1636.52	35.18	0.809	0.50(0.46)	0.92	2612.6	30100.00
12	1613.09	36.58	0.791	0.50(0.46)	0.92	2762.2	30500.00
13	1594.42	37.74	0.776	0.50(0.46)	0.91	2881.7	30400.00
14	1588.91	38.07	0.772	0.50(0.46)	0.91	2914.4	30110.00
15	1514.91	43.53	0.718	0.50(0.45)	0.90	3461.7	30300.00
16	1492.30	45.23	0.704	0.50(0.45)	0.90	3620.3	21400.00
17	1261.39	63.46	0.591	0.50(0.44)	0.87	5160.7	13100.00
18	1225.74	65.96	0.583	0.50(0.44)	0.87	5323.1	13200.00
19	1215.98	66.45	0.581	0.50(0.44)	0.87	5345.2	13210.00
20	709.83	97.67	0.485	0.50(0.43)	0.86	6513.6	13000.00
21	644.30	102.27	0.476	0.50(0.43)	0.86	6539.3	13010.00

TOTAL AREA(ACRES) = 6539.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1726.01 Tc(MIN.) = 19.527
EFFECTIVE AREA(ACRES) = 1378.90 AREA-AVERAGED Fm(INCH/HR) = 0.47
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.86
TOTAL AREA(ACRES) = 6539.3
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.80 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 258.00 DOWNSTREAM(FEET) = 254.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 947.16 CHANNEL SLOPE = 0.0042
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 1726.01
FLOW VELOCITY(FEET/SEC.) = 6.53 FLOW DEPTH(FEET) = 9.39
TRAVEL TIME(MIN.) = 2.42 Tc(MIN.) = 21.95
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1726.01	21.95	1.060	0.50(0.47)	0.93	1378.9	30800.00
2	1724.62	23.98	1.002	0.50(0.47)	0.93	1516.0	30700.00
3	1719.98	25.54	0.962	0.50(0.47)	0.93	1618.4	30600.00
4	1693.91	31.54	0.855	0.50(0.47)	0.93	2028.5	21300.00
5	1688.48	33.41	0.831	0.50(0.46)	0.93	2193.9	30520.00
6	1686.78	33.72	0.827	0.50(0.46)	0.93	2218.9	30410.00
7	1679.59	34.63	0.816	0.50(0.46)	0.93	2289.5	30210.00
8	1675.76	34.97	0.811	0.50(0.46)	0.93	2328.3	30200.00
9	1672.33	35.27	0.808	0.50(0.46)	0.93	2362.4	30540.00
10	1645.79	37.03	0.785	0.50(0.46)	0.92	2550.4	30510.00
11	1636.52	37.63	0.777	0.50(0.46)	0.92	2612.6	30100.00
12	1613.09	39.04	0.759	0.50(0.46)	0.92	2762.2	30500.00
13	1594.42	40.20	0.745	0.50(0.46)	0.91	2881.7	30400.00
14	1588.91	40.53	0.743	0.50(0.46)	0.91	2914.4	30110.00
15	1514.91	46.03	0.698	0.50(0.45)	0.90	3461.7	30300.00
16	1492.30	47.74	0.684	0.50(0.45)	0.90	3620.3	21400.00
17	1261.39	66.07	0.582	0.50(0.44)	0.87	5160.7	13100.00
18	1225.74	68.59	0.573	0.50(0.44)	0.87	5323.1	13200.00
19	1215.98	69.09	0.572	0.50(0.44)	0.87	5345.2	13210.00

20	709.83	100.69	0.479	0.50(0.43)	0.86	6513.6	13000.00
21	644.30	105.36	0.470	0.50(0.43)	0.86	6539.3	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1726.01 Tc(MIN.) = 21.95
AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.93 EFFECTIVE AREA(ACRES) = 1378.90

****
FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610309U.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	38.97	18.86	0.50(0.50)	1.00	65.8	30900.00
2	38.83	18.95	0.50(0.50)	1.00	65.9	30910.00

TOTAL AREA(ACRES) = 65.9

****
FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1726.01	21.95	1.060	0.50(0.47)	0.93	1378.9	30800.00
2	1724.62	23.98	1.002	0.50(0.47)	0.93	1516.0	30700.00
3	1719.98	25.54	0.962	0.50(0.47)	0.93	1618.4	30600.00
4	1693.91	31.54	0.855	0.50(0.47)	0.93	2028.5	21300.00
5	1688.48	33.41	0.831	0.50(0.46)	0.93	2193.9	30520.00
6	1686.78	33.72	0.827	0.50(0.46)	0.93	2218.9	30410.00
7	1679.59	34.63	0.816	0.50(0.46)	0.93	2289.5	30210.00
8	1675.76	34.97	0.811	0.50(0.46)	0.93	2328.3	30200.00
9	1672.33	35.27	0.808	0.50(0.46)	0.93	2362.4	30540.00
10	1645.79	37.03	0.785	0.50(0.46)	0.92	2550.4	30510.00
11	1636.52	37.63	0.777	0.50(0.46)	0.92	2612.6	30100.00
12	1613.09	39.04	0.759	0.50(0.46)	0.92	2762.2	30500.00
13	1594.42	40.20	0.745	0.50(0.46)	0.91	2881.7	30400.00
14	1588.91	40.53	0.743	0.50(0.46)	0.91	2914.4	30110.00
15	1514.91	46.03	0.698	0.50(0.45)	0.90	3461.7	30300.00
16	1492.30	47.74	0.684	0.50(0.45)	0.90	3620.3	21400.00
17	1261.39	66.07	0.582	0.50(0.44)	0.87	5160.7	13100.00
18	1225.74	68.59	0.573	0.50(0.44)	0.87	5323.1	13200.00
19	1215.98	69.09	0.572	0.50(0.44)	0.87	5345.2	13210.00
20	709.83	100.69	0.479	0.50(0.43)	0.86	6513.6	13000.00
21	644.30	105.36	0.470	0.50(0.43)	0.86	6539.3	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	38.97	18.86	1.158	0.50(0.50)	1.00	65.8	30900.00
2	38.83	18.95	1.155	0.50(0.50)	1.00	65.9	30910.00

LONGEST FLOWPATH FROM NODE 30900.00 TO NODE 13305.80 = 3403.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1764.98	18.86	1.158	0.50(0.47)	0.94	1251.1	30900.00
2	1764.84	18.95	1.155	0.50(0.47)	0.94	1256.5	30910.00
3	1759.20	21.95	1.060	0.50(0.47)	0.94	1444.8	30800.00
4	1754.38	23.98	1.002	0.50(0.47)	0.94	1581.9	30700.00
5	1747.39	25.54	0.962	0.50(0.47)	0.93	1684.4	30600.00
6	1714.97	31.54	0.855	0.50(0.47)	0.93	2094.4	21300.00
7	1708.12	33.41	0.831	0.50(0.47)	0.93	2259.8	30520.00
8	1706.19	33.72	0.827	0.50(0.47)	0.93	2284.8	30410.00
9	1698.30	34.63	0.816	0.50(0.46)	0.93	2355.4	30210.00
10	1694.22	34.97	0.811	0.50(0.46)	0.93	2394.2	30200.00
11	1690.56	35.27	0.808	0.50(0.46)	0.93	2428.3	30540.00
12	1662.69	37.03	0.785	0.50(0.46)	0.92	2616.4	30510.00
13	1652.96	37.63	0.777	0.50(0.46)	0.92	2678.5	30100.00
14	1628.46	39.04	0.759	0.50(0.46)	0.92	2828.1	30500.00
15	1608.96	40.20	0.745	0.50(0.46)	0.91	2947.6	30400.00
16	1603.29	40.53	0.743	0.50(0.46)	0.91	2980.3	30110.00
17	1526.62	46.03	0.698	0.50(0.45)	0.90	3527.6	30300.00
18	1503.18	47.74	0.684	0.50(0.45)	0.90	3686.2	21400.00
19	1266.25	66.07	0.582	0.50(0.44)	0.87	5226.6	13100.00
20	1230.09	68.59	0.573	0.50(0.44)	0.87	5389.0	13200.00
21	1220.23	69.09	0.572	0.50(0.44)	0.87	5411.1	13210.00
22	709.83	100.69	0.479	0.50(0.43)	0.86	6579.6	13000.00
23	644.30	105.36	0.470	0.50(0.43)	0.86	6605.2	13010.00

TOTAL AREA(ACRES) = 6605.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1764.98 Tc(MIN.) = 18.863
EFFECTIVE AREA(ACRES) = 1251.05 AREA-AVERAGED Fm(INCH/HR) = 0.47
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.86
TOTAL AREA(ACRES) = 6605.2
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

****
FLOW PROCESS FROM NODE 13305.80 TO NODE 13306.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 254.00 DOWNSTREAM(FEET) = 245.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 583.12 CHANNEL SLOPE = 0.0146
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.123
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.77	0.50	0.998	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1784.28
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.48
AVERAGE FLOW DEPTH(FEET) = 7.53 TRAVEL TIME(MIN.) = 0.93
Tc(MIN.) = 19.79
SUBAREA AREA(ACRES) = 68.77 SUBAREA RUNOFF(CFS) = 38.61
EFFECTIVE AREA(ACRES) = 1319.82 AREA-AVERAGED Fm(INCH/HR) = 0.47
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94
TOTAL AREA(ACRES) = 6673.9 PEAK FLOW RATE(CFS) = 1764.98
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.50 FLOW VELOCITY(FEET/SEC.) = 10.45
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13306.00 = 46294.83 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1764.98	19.79	1.123	0.50(0.47)	0.94	1319.8	30900.00
2	1764.84	19.88	1.120	0.50(0.47)	0.94	1325.2	30910.00
3	1759.20	22.87	1.033	0.50(0.47)	0.94	1513.6	30800.00
4	1754.38	24.91	0.976	0.50(0.47)	0.94	1650.7	30700.00
5	1747.39	26.47	0.944	0.50(0.47)	0.94	1753.1	30600.00
6	1714.97	32.47	0.843	0.50(0.47)	0.93	2163.1	21300.00
7	1708.12	34.35	0.819	0.50(0.47)	0.93	2328.6	30520.00
8	1706.19	34.65	0.815	0.50(0.47)	0.93	2353.6	30410.00
9	1698.30	35.57	0.804	0.50(0.47)	0.93	2424.2	30210.00
10	1694.22	35.90	0.799	0.50(0.47)	0.93	2463.0	30200.00
11	1690.56	36.21	0.796	0.50(0.46)	0.93	2497.1	30540.00
12	1662.69	37.97	0.773	0.50(0.46)	0.92	2685.1	30510.00
13	1652.96	38.57	0.765	0.50(0.46)	0.92	2747.3	30100.00
14	1628.46	39.99	0.747	0.50(0.46)	0.92	2896.9	30500.00
15	1608.96	41.15	0.738	0.50(0.46)	0.92	3016.4	30400.00
16	1603.29	41.48	0.735	0.50(0.46)	0.92	3049.0	30110.00
17	1526.62	46.99	0.690	0.50(0.45)	0.91	3596.4	30300.00
18	1503.18	48.71	0.676	0.50(0.45)	0.90	3755.0	21400.00
19	1266.25	67.08	0.579	0.50(0.44)	0.88	5295.3	13100.00
20	1230.09	69.61	0.570	0.50(0.44)	0.87	5457.8	13200.00
21	1220.23	70.11	0.568	0.50(0.44)	0.87	5479.9	13210.00
22	709.83	101.86	0.477	0.50(0.43)	0.86	6648.3	13000.00
23	644.30	106.56	0.467	0.50(0.43)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1764.98 Tc(MIN.) = 19.79
AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.94 EFFECTIVE AREA(ACRES) = 1319.82

****
FLOW PROCESS FROM NODE 13306.00 TO NODE 13307.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 245.50 DOWNSTREAM(FEET) = 220.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1543.21 CHANNEL SLOPE = 0.0165
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 1764.98
FLOW VELOCITY(FEET/SEC.) = 10.96 FLOW DEPTH(FEET) = 7.33

TRAVEL TIME(MIN.) = 2.35 Tc(MIN.) = 22.14
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1764.98	22.14	1.054	0.50(0.47)	0.94	1319.8	30900.00
2	1764.84	22.22	1.052	0.50(0.47)	0.94	1325.2	30910.00
3	1759.20	25.22	0.969	0.50(0.47)	0.94	1513.6	30800.00
4	1754.38	27.26	0.929	0.50(0.47)	0.94	1650.7	30700.00
5	1747.39	28.82	0.898	0.50(0.47)	0.94	1753.1	30600.00
6	1714.97	34.84	0.813	0.50(0.47)	0.93	2163.1	21300.00
7	1708.12	36.71	0.789	0.50(0.47)	0.93	2328.6	30520.00
8	1706.19	37.02	0.785	0.50(0.47)	0.93	2353.6	30410.00
9	1698.30	37.94	0.773	0.50(0.47)	0.93	2424.2	30210.00
10	1694.22	38.27	0.769	0.50(0.47)	0.93	2463.0	30200.00
11	1690.56	38.58	0.765	0.50(0.46)	0.93	2497.1	30540.00
12	1662.69	40.35	0.744	0.50(0.46)	0.92	2685.1	30510.00
13	1652.96	40.96	0.739	0.50(0.46)	0.92	2747.3	30100.00
14	1628.46	42.38	0.727	0.50(0.46)	0.92	2896.9	30500.00
15	1608.96	43.56	0.718	0.50(0.46)	0.92	3016.4	30400.00
16	1603.29	43.89	0.715	0.50(0.46)	0.92	3049.0	30110.00
17	1526.62	49.43	0.670	0.50(0.45)	0.91	3596.4	30300.00
18	1503.18	51.15	0.658	0.50(0.45)	0.90	3755.0	21400.00
19	1266.25	69.63	0.570	0.50(0.44)	0.88	5295.3	13100.00
20	1230.09	72.18	0.561	0.50(0.44)	0.87	5457.8	13200.00
21	1220.23	72.68	0.559	0.50(0.44)	0.87	5479.9	13210.00
22	709.83	104.81	0.471	0.50(0.43)	0.86	6648.3	13000.00
23	644.30	109.58	0.461	0.50(0.43)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1764.98 Tc(MIN.) = 22.14
AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.94 EFFECTIVE AREA(ACRES) = 1319.82

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610310U.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	41.94	24.94	0.50(0.50)	1.00	97.9	31000.00

TOTAL AREA(ACRES) = 97.9

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1764.98	22.14	1.054	0.50(0.47)	0.94	1319.8	30900.00
2	1764.84	22.22	1.052	0.50(0.47)	0.94	1325.2	30910.00
3	1759.20	25.22	0.969	0.50(0.47)	0.94	1513.6	30800.00
4	1754.38	27.26	0.929	0.50(0.47)	0.94	1650.7	30700.00
5	1747.39	28.82	0.898	0.50(0.47)	0.94	1753.1	30600.00
6	1714.97	34.84	0.813	0.50(0.47)	0.93	2163.1	21300.00
7	1708.12	36.71	0.789	0.50(0.47)	0.93	2328.6	30520.00
8	1706.19	37.02	0.785	0.50(0.47)	0.93	2353.6	30410.00
9	1698.30	37.94	0.773	0.50(0.47)	0.93	2424.2	30210.00
10	1694.22	38.27	0.769	0.50(0.47)	0.93	2463.0	30200.00
11	1690.56	38.58	0.765	0.50(0.46)	0.93	2497.1	30540.00
12	1662.69	40.35	0.744	0.50(0.46)	0.92	2685.1	30510.00
13	1652.96	40.96	0.739	0.50(0.46)	0.92	2747.3	30100.00
14	1628.46	42.38	0.727	0.50(0.46)	0.92	2896.9	30500.00
15	1608.96	43.56	0.718	0.50(0.46)	0.92	3016.4	30400.00
16	1603.29	43.89	0.715	0.50(0.46)	0.92	3049.0	30110.00
17	1526.62	49.43	0.670	0.50(0.45)	0.91	3596.4	30300.00
18	1503.18	51.15	0.658	0.50(0.45)	0.90	3755.0	21400.00
19	1266.25	69.63	0.570	0.50(0.44)	0.88	5295.3	13100.00
20	1230.09	72.18	0.561	0.50(0.44)	0.87	5457.8	13200.00
21	1220.23	72.68	0.559	0.50(0.44)	0.87	5479.9	13210.00
22	709.83	104.81	0.471	0.50(0.43)	0.86	6648.3	13000.00
23	644.30	109.58	0.461	0.50(0.43)	0.86	6673.9	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	41.94	24.94	0.975	0.50(0.50)	1.00	97.9	31000.00

LONGEST FLOWPATH FROM NODE 31000.00 TO NODE 13307.00 = 5162.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1806.92	22.14	1.054	0.50(0.47)	0.94	1406.7	30900.00
2	1806.78	22.22	1.052	0.50(0.47)	0.94	1412.5	30910.00
3	1801.68	24.94	0.975	0.50(0.47)	0.94	1593.6	31000.00
4	1800.60	25.22	0.969	0.50(0.47)	0.94	1611.5	30800.00
5	1792.26	27.26	0.929	0.50(0.47)	0.94	1748.6	30700.00
6	1782.58	28.82	0.898	0.50(0.47)	0.94	1851.0	30600.00
7	1742.66	34.84	0.813	0.50(0.47)	0.94	2261.0	21300.00
8	1733.70	36.71	0.789	0.50(0.47)	0.93	2426.5	30520.00
9	1731.41	37.02	0.785	0.50(0.47)	0.93	2451.4	30410.00
10	1722.50	37.94	0.773	0.50(0.47)	0.93	2522.1	30210.00
11	1718.04	38.27	0.769	0.50(0.47)	0.93	2560.8	30200.00
12	1714.03	38.58	0.765	0.50(0.47)	0.93	2594.9	30540.00
13	1684.30	40.35	0.744	0.50(0.46)	0.93	2783.0	30510.00
14	1674.14	40.96	0.739	0.50(0.46)	0.93	2845.2	30100.00
15	1648.61	42.38	0.727	0.50(0.46)	0.92	2994.8	30500.00
16	1628.25	43.56	0.718	0.50(0.46)	0.92	3114.3	30400.00
17	1622.35	43.89	0.715	0.50(0.46)	0.92	3146.9	30110.00
18	1541.67	49.43	0.670	0.50(0.45)	0.91	3694.2	30300.00
19	1517.19	51.15	0.658	0.50(0.45)	0.90	3852.9	21400.00
20	1272.51	69.63	0.570	0.50(0.44)	0.88	5393.2	13100.00
21	1235.58	72.18	0.561	0.50(0.44)	0.88	5555.7	13200.00

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    22     1225.56   72.68    0.559  0.50( 0.44) 0.88    5577.8   13210.00
    23      709.93  104.81    0.471  0.50( 0.43) 0.86    6746.2   13000.00
    24      644.40  109.58    0.461  0.50( 0.43) 0.86    6771.8   13010.00
   TOTAL AREA(ACRES) =      6771.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1806.92  Tc(MIN.) =   22.137
  EFFECTIVE AREA(ACRES) =   1406.71  AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.94
  TOTAL AREA(ACRES) =     6771.8
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    220.00  DOWNSTREAM(FEET) =    212.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.0086
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1806.92
  FLOW VELOCITY(FEET/SEC.) =   8.64   FLOW DEPTH(FEET) =   8.35
  TRAVEL TIME(MIN.) =   1.79   Tc(MIN.) =   23.92
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1806.92   23.92    1.004  0.50( 0.47) 0.94    1406.7   30900.00
      2     1806.78   24.01    1.001  0.50( 0.47) 0.94    1412.5   30910.00
      3     1801.68   26.72    0.939  0.50( 0.47) 0.94    1593.6   31000.00
      4     1800.60   27.01    0.934  0.50( 0.47) 0.94    1611.5   30800.00
      5     1792.26   29.05    0.894  0.50( 0.47) 0.94    1748.6   30700.00
      6     1782.58   30.61    0.867  0.50( 0.47) 0.94    1851.0   30600.00
      7     1742.66   36.64    0.790  0.50( 0.47) 0.94    2261.0   21300.00
      8     1733.70   38.52    0.766  0.50( 0.47) 0.93    2426.5   30520.00
      9     1731.41   38.82    0.762  0.50( 0.47) 0.93    2451.4   30410.00
     10     1722.50   39.74    0.750  0.50( 0.47) 0.93    2522.1   30210.00
     11     1718.04   40.08    0.746  0.50( 0.47) 0.93    2560.8   30200.00
     12     1714.03   40.39    0.744  0.50( 0.47) 0.93    2594.9   30540.00
     13     1684.30   42.17    0.729  0.50( 0.46) 0.93    2783.0   30510.00
     14     1674.14   42.78    0.724  0.50( 0.46) 0.93    2845.2   30100.00
     15     1648.61   44.21    0.712  0.50( 0.46) 0.92    2994.8   30500.00
     16     1628.25   45.39    0.703  0.50( 0.46) 0.92    3114.3   30400.00
     17     1622.35   45.72    0.700  0.50( 0.46) 0.92    3146.9   30110.00
     18     1541.67   51.28    0.657  0.50( 0.45) 0.91    3694.2   30300.00
     19     1517.19   53.01    0.646  0.50( 0.45) 0.90    3852.9   21400.00
     20     1272.51   71.58    0.563  0.50( 0.44) 0.88    5393.2   13100.00
     21     1235.58   74.14    0.554  0.50( 0.44) 0.88    5555.7   13200.00
     22     1225.56   74.65    0.553  0.50( 0.44) 0.88    5577.8   13210.00
     23      709.93  107.06    0.466  0.50( 0.43) 0.86    6746.2   13000.00
     24      644.40  111.89    0.457  0.50( 0.43) 0.86    6771.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1806.92  Tc(MIN.) =   23.92
  AREA-AVERAGED Fm(INCH/HR) =  0.47  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.94  EFFECTIVE AREA(ACRES) =    1406.71
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610212U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       78.46   43.31  0.50( 0.50) 1.00     342.8   21200.00
    TOTAL AREA(ACRES) =      342.8

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1806.92   23.92    1.004  0.50( 0.47) 0.94    1406.7   30900.00
      2     1806.78   24.01    1.001  0.50( 0.47) 0.94    1412.5   30910.00
      3     1801.68   26.72    0.939  0.50( 0.47) 0.94    1593.6   31000.00
      4     1800.60   27.01    0.934  0.50( 0.47) 0.94    1611.5   30800.00
      5     1792.26   29.05    0.894  0.50( 0.47) 0.94    1748.6   30700.00
      6     1782.58   30.61    0.867  0.50( 0.47) 0.94    1851.0   30600.00
      7     1742.66   36.64    0.790  0.50( 0.47) 0.94    2261.0   21300.00
      8     1733.70   38.52    0.766  0.50( 0.47) 0.93    2426.5   30520.00
      9     1731.41   38.82    0.762  0.50( 0.47) 0.93    2451.4   30410.00
     10     1722.50   39.74    0.750  0.50( 0.47) 0.93    2522.1   30210.00
     11     1718.04   40.08    0.746  0.50( 0.47) 0.93    2560.8   30200.00
     12     1714.03   40.39    0.744  0.50( 0.47) 0.93    2594.9   30540.00
     13     1684.30   42.17    0.729  0.50( 0.46) 0.93    2783.0   30510.00
     14     1674.14   42.78    0.724  0.50( 0.46) 0.93    2845.2   30100.00
     15     1648.61   44.21    0.712  0.50( 0.46) 0.92    2994.8   30500.00
     16     1628.25   45.39    0.703  0.50( 0.46) 0.92    3114.3   30400.00
     17     1622.35   45.72    0.700  0.50( 0.46) 0.92    3146.9   30110.00
     18     1541.67   51.28    0.657  0.50( 0.45) 0.91    3694.2   30300.00
     19     1517.19   53.01    0.646  0.50( 0.45) 0.90    3852.9   21400.00
     20     1272.51   71.58    0.563  0.50( 0.44) 0.88    5393.2   13100.00
     21     1235.58   74.14    0.554  0.50( 0.44) 0.88    5555.7   13200.00
     22     1225.56   74.65    0.553  0.50( 0.44) 0.88    5577.8   13210.00
     23      709.93  107.06    0.466  0.50( 0.43) 0.86    6746.2   13000.00
     24      644.40  111.89    0.457  0.50( 0.43) 0.86    6771.8   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       78.46   43.31    0.720  0.50( 0.50) 1.00     342.8   21200.00
```

LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 13308.00 = 11049.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1885.38	23.92	1.004	0.50(0.48)	0.95	1596.1	30900.00
2	1885.24	24.01	1.001	0.50(0.48)	0.95	1602.5	30910.00
3	1880.14	26.72	0.939	0.50(0.47)	0.95	1805.1	31000.00
4	1879.06	27.01	0.934	0.50(0.47)	0.95	1825.3	30800.00
5	1870.72	29.05	0.894	0.50(0.47)	0.95	1978.5	30700.00
6	1861.04	30.61	0.867	0.50(0.47)	0.95	2093.3	30600.00
7	1821.12	36.64	0.790	0.50(0.47)	0.94	2551.0	21300.00
8	1812.15	38.52	0.766	0.50(0.47)	0.94	2731.3	30520.00
9	1809.87	38.82	0.762	0.50(0.47)	0.94	2758.7	30410.00
10	1800.96	39.74	0.750	0.50(0.47)	0.94	2836.7	30210.00
11	1796.49	40.08	0.746	0.50(0.47)	0.94	2878.1	30200.00
12	1792.49	40.39	0.744	0.50(0.47)	0.94	2914.6	30540.00
13	1762.76	42.17	0.729	0.50(0.47)	0.93	3116.8	30510.00
14	1752.59	42.78	0.724	0.50(0.47)	0.93	3183.8	30100.00
15	1743.18	43.31	0.720	0.50(0.47)	0.93	3243.1	21200.00
16	1724.42	44.21	0.712	0.50(0.47)	0.93	3337.6	30500.00
17	1700.61	45.39	0.703	0.50(0.46)	0.93	3457.0	30400.00
18	1693.73	45.72	0.700	0.50(0.46)	0.93	3489.7	30110.00
19	1597.69	51.28	0.657	0.50(0.46)	0.92	4037.0	30300.00
20	1569.37	53.01	0.646	0.50(0.46)	0.91	4195.7	21400.00
21	1295.02	71.58	0.563	0.50(0.44)	0.89	5736.0	13100.00
22	1254.95	74.14	0.554	0.50(0.44)	0.88	5898.4	13200.00
23	1244.32	74.65	0.553	0.50(0.44)	0.88	5920.5	13210.00
24	709.93	107.06	0.466	0.50(0.44)	0.87	7089.0	13000.00
25	644.40	111.89	0.457	0.50(0.44)	0.87	7114.6	13010.00
TOTAL AREA(ACRES) =			7114.6				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1885.38 Tc(MIN.) = 23.923
EFFECTIVE AREA(ACRES) = 1596.07 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.95
TOTAL AREA(ACRES) = 7114.6
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 10

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==

****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==

****

FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: S29.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11065.92	16.49	0.50(0.49)	0.99	3017.8	50200.00
2	11030.52	31.60	0.50(0.49)	0.99	6839.4	50300.00
3	10900.56	38.20	0.50(0.49)	0.99	8873.6	50120.00
4	10221.87	56.07	0.50(0.50)	0.99	14062.9	31400.00
5	9881.36	66.06	0.50(0.50)	0.99	16718.1	11801.00
6	9577.07	77.47	0.50(0.50)	0.99	19928.6	11500.00
7	9200.08	89.45	0.50(0.50)	0.99	23977.3	11000.00
8	8761.40	105.81	0.50(0.50)	0.99	30832.0	12500.00
9	8557.71	111.98	0.50(0.50)	0.99	33702.5	11910.00
10	7900.80	120.72	0.50(0.50)	0.99	36991.3	11130.00
11	7239.10	132.19	0.50(0.50)	0.99	40659.8	11620.00
12	6199.20	148.08	0.50(0.50)	0.99	45197.4	12400.00
13	5371.21	159.48	0.50(0.50)	0.99	47494.1	12201.00
14	4774.07	168.81	0.50(0.50)	0.99	48783.3	12111.00
15	3862.64	184.64	0.50(0.50)	0.99	50710.3	12261.00
16	3399.11	194.06	0.50(0.50)	0.99	51522.0	10200.00
17	2845.45	209.48	0.50(0.50)	0.99	52759.4	10300.00
18	2618.85	216.34	0.50(0.50)	0.99	53110.5	12010.00
19	2153.04	236.96	0.50(0.50)	0.99	53439.8	12000.00
20	1213.53	305.89	0.50(0.50)	0.99	54110.0	10100.00
TOTAL AREA(ACRES) =			54110.0			

****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 14.0

>>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11065.92	16.49	0.50(0.49)	0.99	3017.8	50200.00
2	11030.52	31.60	0.50(0.49)	0.99	6839.4	50300.00
3	10900.56	38.20	0.50(0.49)	0.99	8873.6	50120.00
4	10221.87	56.07	0.50(0.50)	0.99	14062.9	31400.00
5	9881.36	66.06	0.50(0.50)	0.99	16718.1	11801.00
6	9577.07	77.47	0.50(0.50)	0.99	19928.6	11500.00
7	9200.08	89.45	0.50(0.50)	0.99	23977.3	11000.00
8	8761.40	105.81	0.50(0.50)	0.99	30832.0	12500.00
9	8557.71	111.98	0.50(0.50)	0.99	33702.5	11910.00
10	7900.80	120.72	0.50(0.50)	0.99	36991.3	11130.00
11	7239.10	132.19	0.50(0.50)	0.99	40659.8	11620.00
12	6199.20	148.08	0.50(0.50)	0.99	45197.4	12400.00
13	5371.21	159.48	0.50(0.50)	0.99	47494.1	12201.00
14	4774.07	168.81	0.50(0.50)	0.99	48783.3	12111.00
15	3862.64	184.64	0.50(0.50)	0.99	50710.3	12261.00
16	3399.11	194.06	0.50(0.50)	0.99	51522.0	10200.00
17	2845.45	209.48	0.50(0.50)	0.99	52759.4	10300.00
18	2618.85	216.34	0.50(0.50)	0.99	53110.5	12010.00
19	2153.04	236.96	0.50(0.50)	0.99	53439.8	12000.00

```
    20     1213.53  305.89  0.50( 0.50) 0.99   54110.0   10100.00
   TOTAL AREA(ACRES) =     54110.0

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  13308.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    213.00  DOWNSTREAM(FEET) =    212.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1389.52   CHANNEL SLOPE =  0.0007
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

  CHANNEL FLOW THRU SUBAREA(CFS) =   11065.92
  FLOW VELOCITY(FEET/SEC.) =   9.22   FLOW DEPTH(FEET) =  20.00
  TRAVEL TIME(MIN.) =   2.51   Tc(MIN.) =   19.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11065.92   19.00    1.153  0.50( 0.49) 0.99    3017.8   50200.00
      2    11030.52   34.12    0.822  0.50( 0.49) 0.99    6839.4   50300.00
      3    10900.56   40.75    0.741  0.50( 0.49) 0.99    8873.6   50120.00
      4    10221.87   58.79    0.611  0.50( 0.50) 0.99   14062.9   31400.00
      5     9881.36   68.87    0.573  0.50( 0.50) 0.99   16718.1   11801.00
      6     9577.07   80.38    0.533  0.50( 0.50) 0.99   19928.6   11500.00
      7     9200.08   92.47    0.495  0.50( 0.50) 0.99   23977.3   11000.00
      8     8761.40  108.98    0.463  0.50( 0.50) 0.99   30832.0   12500.00
      9     8557.71  115.23    0.450  0.50( 0.50) 0.99   33702.5   11910.00
     10     7900.80  124.24    0.436  0.50( 0.50) 0.99   36991.3   11130.00
     11     7239.10  136.03    0.422  0.50( 0.50) 0.99   40659.8   11620.00
     12     6199.20  152.11    0.402  0.50( 0.50) 0.99   45197.4   12400.00
     13     5371.21  163.66    0.389  0.50( 0.50) 0.99   47494.1   12201.00
     14     4774.07  173.11    0.377  0.50( 0.50) 0.99   48783.3   12111.00
     15     3862.64  189.18    0.364  0.50( 0.50) 0.99   50710.3   12261.00
     16     3399.11  198.74    0.359  0.50( 0.50) 0.99   51522.0   10200.00
     17     2845.45  214.38    0.350  0.50( 0.50) 0.99   52759.4   10300.00
     18     2618.85  221.34    0.346  0.50( 0.50) 0.99   53110.5   12010.00
     19     2153.04  242.21    0.335  0.50( 0.50) 0.99   53439.8   12000.00
     20     1213.53  311.94    0.297  0.50( 0.50) 0.99   54110.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   11065.92  Tc(MIN.) =   19.00
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    3017.84

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
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** MAIN STREAM CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    11065.92   19.00    1.153  0.50( 0.49) 0.99    3017.8   50200.00
    2    11030.52   34.12    0.822  0.50( 0.49) 0.99    6839.4   50300.00
    3    10900.56   40.75    0.741  0.50( 0.49) 0.99    8873.6   50120.00
    4    10221.87   58.79    0.611  0.50( 0.50) 0.99   14062.9   31400.00
    5     9881.36   68.87    0.573  0.50( 0.50) 0.99   16718.1   11801.00
    6     9577.07   80.38    0.533  0.50( 0.50) 0.99   19928.6   11500.00
    7     9200.08   92.47    0.495  0.50( 0.50) 0.99   23977.3   11000.00
    8     8761.40  108.98    0.463  0.50( 0.50) 0.99   30832.0   12500.00
    9     8557.71  115.23    0.450  0.50( 0.50) 0.99   33702.5   11910.00
   10     7900.80  124.24    0.436  0.50( 0.50) 0.99   36991.3   11130.00
   11     7239.10  136.03    0.422  0.50( 0.50) 0.99   40659.8   11620.00
   12     6199.20  152.11    0.402  0.50( 0.50) 0.99   45197.4   12400.00
   13     5371.21  163.66    0.389  0.50( 0.50) 0.99   47494.1   12201.00
   14     4774.07  173.11    0.377  0.50( 0.50) 0.99   48783.3   12111.00
   15     3862.64  189.18    0.364  0.50( 0.50) 0.99   50710.3   12261.00
   16     3399.11  198.74    0.359  0.50( 0.50) 0.99   51522.0   10200.00
   17     2845.45  214.38    0.350  0.50( 0.50) 0.99   52759.4   10300.00
   18     2618.85  221.34    0.346  0.50( 0.50) 0.99   53110.5   12010.00
   19     2153.04  242.21    0.335  0.50( 0.50) 0.99   53439.8   12000.00
   20     1213.53  311.94    0.297  0.50( 0.50) 0.99   54110.0   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1885.38   23.92    1.004  0.50( 0.48) 0.95    1596.1   30900.00
    2     1885.24   24.01    1.001  0.50( 0.48) 0.95    1602.5   30910.00
    3     1880.14   26.72    0.939  0.50( 0.47) 0.95    1805.1   31000.00
    4     1879.06   27.01    0.934  0.50( 0.47) 0.95    1825.3   30800.00
    5     1870.72   29.05    0.894  0.50( 0.47) 0.95    1978.5   30700.00
    6     1861.04   30.61    0.867  0.50( 0.47) 0.95    2093.3   30600.00
    7     1821.12   36.64    0.790  0.50( 0.47) 0.94    2551.0   21300.00
    8     1812.15   38.52    0.766  0.50( 0.47) 0.94    2731.3   30520.00
    9     1809.87   38.82    0.762  0.50( 0.47) 0.94    2758.7   30410.00
   10     1800.96   39.74    0.750  0.50( 0.47) 0.94    2836.7   30210.00
   11     1796.49   40.08    0.746  0.50( 0.47) 0.94    2878.1   30200.00
   12     1792.49   40.39    0.744  0.50( 0.47) 0.94    2914.6   30540.00
   13     1762.76   42.17    0.729  0.50( 0.47) 0.93    3116.8   30510.00
   14     1752.59   42.78    0.724  0.50( 0.47) 0.93    3183.8   30100.00
   15     1743.18   43.31    0.720  0.50( 0.47) 0.93    3243.1   21200.00
   16     1724.42   44.21    0.712  0.50( 0.47) 0.93    3337.6   30500.00
   17     1700.61   45.39    0.703  0.50( 0.46) 0.93    3457.0   30400.00
   18     1693.73   45.72    0.700  0.50( 0.46) 0.93    3489.7   30110.00
   19     1597.69   51.28    0.657  0.50( 0.46) 0.92    4037.0   30300.00
   20     1569.37   53.01    0.646  0.50( 0.46) 0.91    4195.7   21400.00
   21     1295.02   71.58    0.563  0.50( 0.44) 0.89    5736.0   13100.00
   22     1254.95   74.14    0.554  0.50( 0.44) 0.88    5898.4   13200.00
   23     1244.32   74.65    0.553  0.50( 0.44) 0.88    5920.5   13210.00
   24      709.93  107.06    0.466  0.50( 0.44) 0.87    7089.0   13000.00
   25      644.40  111.89    0.457  0.50( 0.44) 0.87    7114.6   13010.00
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	12951.30	19.00	1.153	0.50(0.49)	0.98	4285.5	50200.00
2	12939.77	23.92	1.004	0.50(0.49)	0.98	5858.3	30900.00
3	12939.43	24.01	1.001	0.50(0.49)	0.98	5886.4	30910.00
4	12927.98	26.72	0.939	0.50(0.49)	0.98	6775.2	31000.00
5	12926.23	27.01	0.934	0.50(0.49)	0.98	6867.8	30800.00
6	12913.11	29.05	0.894	0.50(0.49)	0.98	7537.0	30700.00
7	12899.77	30.61	0.867	0.50(0.49)	0.98	8046.5	30600.00
8	12868.35	34.12	0.822	0.50(0.49)	0.98	9198.9	50300.00
9	12802.20	36.64	0.790	0.50(0.49)	0.98	10164.4	21300.00
10	12756.41	38.52	0.766	0.50(0.49)	0.98	10921.0	30520.00
11	12748.13	38.82	0.762	0.50(0.49)	0.98	11042.2	30410.00
12	12721.22	39.74	0.750	0.50(0.49)	0.98	11401.8	30210.00
13	12710.10	40.08	0.746	0.50(0.49)	0.98	11547.5	30200.00
14	12700.10	40.39	0.744	0.50(0.49)	0.98	11677.9	30540.00
15	12687.04	40.75	0.741	0.50(0.49)	0.98	11829.1	50120.00
16	12609.84	42.17	0.729	0.50(0.49)	0.97	12399.3	30510.00
17	12576.78	42.78	0.724	0.50(0.49)	0.97	12641.4	30100.00
18	12547.53	43.31	0.720	0.50(0.49)	0.97	12852.4	21200.00
19	12494.82	44.21	0.712	0.50(0.49)	0.97	13206.4	30500.00
20	12426.56	45.39	0.703	0.50(0.49)	0.97	13665.7	30400.00
21	12407.21	45.72	0.700	0.50(0.49)	0.97	13793.8	30110.00
22	12101.89	51.28	0.657	0.50(0.49)	0.97	15941.2	30300.00
23	12008.43	53.01	0.646	0.50(0.49)	0.97	16597.9	21400.00
24	11705.92	58.79	0.611	0.50(0.48)	0.97	18737.5	31400.00
25	11216.41	68.87	0.573	0.50(0.48)	0.97	22229.4	11801.00
26	11104.77	71.58	0.563	0.50(0.48)	0.96	23209.7	13100.00
27	10996.95	74.14	0.554	0.50(0.48)	0.96	24087.0	13200.00
28	10972.90	74.65	0.553	0.50(0.48)	0.96	24250.6	13210.00
29	10726.92	80.38	0.533	0.50(0.48)	0.96	26055.7	11500.00
30	10150.62	92.47	0.495	0.50(0.48)	0.97	30540.2	11000.00
31	9522.41	107.06	0.466	0.50(0.48)	0.97	37123.0	13000.00
32	9445.24	108.98	0.463	0.50(0.49)	0.97	37931.2	12500.00
33	9311.06	111.89	0.457	0.50(0.49)	0.97	39281.8	13010.00
34	9192.84	115.23	0.450	0.50(0.49)	0.97	40817.1	11910.00
35	8515.52	124.24	0.436	0.50(0.49)	0.97	44105.9	11130.00
36	7833.88	136.03	0.422	0.50(0.49)	0.97	47774.5	11620.00
37	6766.76	152.11	0.402	0.50(0.49)	0.98	52312.0	12400.00
38	5919.24	163.66	0.389	0.50(0.49)	0.98	54608.8	12201.00
39	5306.09	173.11	0.377	0.50(0.49)	0.98	55897.9	12111.00
40	4375.96	189.18	0.364	0.50(0.49)	0.98	57824.9	12261.00
41	3905.08	198.74	0.359	0.50(0.49)	0.98	58636.6	10200.00
42	3339.42	214.38	0.350	0.50(0.49)	0.98	59874.0	10300.00
43	3107.47	221.34	0.346	0.50(0.49)	0.98	60225.1	12010.00
44	2625.64	242.21	0.335	0.50(0.49)	0.98	60554.4	12000.00
45	1632.59	311.94	0.297	0.50(0.49)	0.98	61224.6	10100.00

TOTAL AREA(ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 12951.30 Tc(MIN.) = 19.000
EFFECTIVE AREA(ACRES) = 4285.50 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 61224.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 61224.6 TC(MIN.) = 19.00
EFFECTIVE AREA(ACRES) = 4285.50 AREA-AVERAGED Fm(INCH/HR)= 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.976
PEAK FLOW RATE(CFS) = 12951.30

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)		Ap	Ae (ACRES)	HEADWATER NODE
1	12951.30	19.00	1.153	0.50(0.49)		0.98	4285.5	50200.00
2	12939.77	23.92	1.004	0.50(0.49)		0.98	5858.3	30900.00
3	12939.43	24.01	1.001	0.50(0.49)		0.98	5886.4	30910.00
4	12927.98	26.72	0.939	0.50(0.49)		0.98	6775.2	31000.00
5	12926.23	27.01	0.934	0.50(0.49)		0.98	6867.8	30800.00
6	12913.11	29.05	0.894	0.50(0.49)		0.98	7537.0	30700.00
7	12899.77	30.61	0.867	0.50(0.49)		0.98	8046.5	30600.00
8	12868.35	34.12	0.822	0.50(0.49)		0.98	9198.9	50300.00
9	12802.20	36.64	0.790	0.50(0.49)		0.98	10164.4	21300.00
10	12756.41	38.52	0.766	0.50(0.49)		0.98	10921.0	30520.00
11	12748.13	38.82	0.762	0.50(0.49)		0.98	11042.2	30410.00
12	12721.22	39.74	0.750	0.50(0.49)		0.98	11401.8	30210.00
13	12710.10	40.08	0.746	0.50(0.49)		0.98	11547.5	30200.00
14	12700.10	40.39	0.744	0.50(0.49)		0.98	11677.9	30540.00
15	12687.04	40.75	0.741	0.50(0.49)		0.98	11829.1	50120.00
16	12609.84	42.17	0.729	0.50(0.49)		0.97	12399.3	30510.00
17	12576.78	42.78	0.724	0.50(0.49)		0.97	12641.4	30100.00
18	12547.53	43.31	0.720	0.50(0.49)		0.97	12852.4	21200.00
19	12494.82	44.21	0.712	0.50(0.49)		0.97	13206.4	30500.00
20	12426.56	45.39	0.703	0.50(0.49)		0.97	13665.7	30400.00
21	12407.21	45.72	0.700	0.50(0.49)		0.97	13793.8	30110.00
22	12101.89	51.28	0.657	0.50(0.49)		0.97	15941.2	30300.00
23	12008.43	53.01	0.646	0.50(0.49)		0.97	16597.9	21400.00
24	11705.92	58.79	0.611	0.50(0.48)		0.97	18737.5	31400.00
25	11216.41	68.87	0.573	0.50(0.48)		0.97	22229.4	11801.00
26	11104.77	71.58	0.563	0.50(0.48)		0.96	23209.7	13100.00
27	10996.95	74.14	0.554	0.50(0.48)		0.96	24087.0	13200.00
28	10972.90	74.65	0.553	0.50(0.48)		0.96	24250.6	13210.00
29	10726.92	80.38	0.533	0.50(0.48)		0.96	26055.7	11500.00
30	10150.62	92.47	0.495	0.50(0.48)		0.97	30540.2	11000.00
31	9522.41	107.06	0.466	0.50(0.48)		0.97	37123.0	13000.00
32	9445.24	108.98	0.463	0.50(0.49)		0.97	37931.2	12500.00
33	9311.06	111.89	0.457	0.50(0.49)		0.97	39281.8	13010.00
34	9192.84	115.23	0.450	0.50(0.49)		0.97	40817.1	11910.00
35	8515.52	124.24	0.436	0.50(0.49)		0.97	44105.9	11130.00
36	7833.88	136.03	0.422	0.50(0.49)		0.97	47774.5	11620.00
37	6766.76	152.11	0.402	0.50(0.49)		0.98	52312.0	12400.00
38	5919.24	163.66	0.389	0.50(0.49)		0.98	54608.8	12201.00
39	5306.09	173.11	0.377	0.50(0.49)		0.98	55897.9	12111.00
40	4375.96	189.18	0.364	0.50(0.49)		0.98	57824.9	12261.00
41	3905.08	198.74	0.359	0.50(0.49)		0.98	58636.6	10200.00
42	3339.42	214.38	0.350	0.50(0.49)		0.98	59874.0	10300.00
43	3107.47	221.34	0.346	0.50(0.49)		0.98	60225.1	12010.00
44	2625.64	242.21	0.335	0.50(0.49)		0.98	60554.4	12000.00
45	1632.59	311.94	0.297	0.50(0.49)		0.98	61224.6	10100.00

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END OF RATIONAL METHOD ANALYSIS

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******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

------------------------------------------------------------------------------
  FILE NAME: S34.DAT
  TIME/DATE OF STUDY: 07:24 07/16/2018
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.632
   2)   10.00;  1.756
   3)   15.00;  1.302
   4)   20.00;  1.113
   5)   25.00;  0.972
   6)   30.00;  0.874
   7)   40.00;  0.746
   8)   50.00;  0.664
   9)   60.00;  0.602
  10)   90.00;  0.499
  11)  120.00;  0.439
  12)  180.00;  0.368
  13)  360.00;  0.270
  14) 1200.00;  0.118
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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******************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S33.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    12951.30   19.00  0.50( 0.49) 0.98    4285.5   50200.00
      2    12868.35   34.12  0.50( 0.49) 0.98    9198.9   50300.00
      3    12609.84   42.17  0.50( 0.49) 0.97   12399.3   30510.00
      4    12101.89   51.28  0.50( 0.49) 0.97   15941.2   30300.00
      5    11705.92   58.79  0.50( 0.48) 0.97   18737.5   31400.00
      6    11216.41   68.87  0.50( 0.48) 0.97   22229.4   11801.00
      7    10726.92   80.38  0.50( 0.48) 0.96   26055.7   11500.00
      8    10150.62   92.47  0.50( 0.48) 0.97   30540.2   11000.00
      9     9522.41  107.06  0.50( 0.48) 0.97   37123.0   13000.00
     10     8515.52  124.24  0.50( 0.49) 0.97   44105.9   11130.00
     11     7833.88  136.03  0.50( 0.49) 0.97   47774.5   11620.00
     12     6766.76  152.11  0.50( 0.49) 0.98   52312.0   12400.00
     13     5919.24  163.66  0.50( 0.49) 0.98   54608.8   12201.00
     14     5306.09  173.11  0.50( 0.49) 0.98   55897.9   12111.00
     15     4375.96  189.18  0.50( 0.49) 0.98   57824.9   12261.00
     16     3905.08  198.74  0.50( 0.49) 0.98   58636.6   10200.00
     17     3339.42  214.38  0.50( 0.49) 0.98   59874.0   10300.00
     18     3107.47  221.34  0.50( 0.49) 0.98   60225.1   12010.00
     19     2625.64  242.21  0.50( 0.49) 0.98   60554.4   12000.00
     20     1632.59  311.94  0.50( 0.49) 0.98   61224.6   10100.00
   TOTAL AREA(ACRES) =    61224.6

******************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 14.0
------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    12951.30   19.00  0.50( 0.49) 0.98    4285.5   50200.00
      2    12868.35   34.12  0.50( 0.49) 0.98    9198.9   50300.00
      3    12609.84   42.17  0.50( 0.49) 0.97   12399.3   30510.00
      4    12101.89   51.28  0.50( 0.49) 0.97   15941.2   30300.00
      5    11705.92   58.79  0.50( 0.48) 0.97   18737.5   31400.00
      6    11216.41   68.87  0.50( 0.48) 0.97   22229.4   11801.00
      7    10726.92   80.38  0.50( 0.48) 0.96   26055.7   11500.00
      8    10150.62   92.47  0.50( 0.48) 0.97   30540.2   11000.00
      9     9522.41  107.06  0.50( 0.48) 0.97   37123.0   13000.00
     10     8515.52  124.24  0.50( 0.49) 0.97   44105.9   11130.00
     11     7833.88  136.03  0.50( 0.49) 0.97   47774.5   11620.00
     12     6766.76  152.11  0.50( 0.49) 0.98   52312.0   12400.00
     13     5919.24  163.66  0.50( 0.49) 0.98   54608.8   12201.00
     14     5306.09  173.11  0.50( 0.49) 0.98   55897.9   12111.00
     15     4375.96  189.18  0.50( 0.49) 0.98   57824.9   12261.00
     16     3905.08  198.74  0.50( 0.49) 0.98   58636.6   10200.00
     17     3339.42  214.38  0.50( 0.49) 0.98   59874.0   10300.00
     18     3107.47  221.34  0.50( 0.49) 0.98   60225.1   12010.00
```

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     19     2625.64  242.21  0.50( 0.49) 0.98   60554.4   12000.00
     20     1632.59  311.94  0.50( 0.49) 0.98   61224.6   10100.00
    TOTAL AREA(ACRES) =     61224.6

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13402.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    212.00  DOWNSTREAM(FEET) =    209.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   623.02   CHANNEL SLOPE =  0.0048
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   12951.30
  FLOW VELOCITY(FEET/SEC.) =  14.09   FLOW DEPTH(FEET) =  17.50
  TRAVEL TIME(MIN.) =   0.74   Tc(MIN.) =   19.74
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12951.30   19.74    1.123  0.50( 0.49) 0.98    4285.5   50200.00
      2    12868.35   34.85    0.812  0.50( 0.49) 0.98    9198.9   50300.00
      3    12609.84   42.91    0.722  0.50( 0.49) 0.97   12399.3   30510.00
      4    12101.89   52.03    0.651  0.50( 0.49) 0.97   15941.2   30300.00
      5    11705.92   59.54    0.605  0.50( 0.48) 0.97   18737.5   31400.00
      6    11216.41   69.63    0.569  0.50( 0.48) 0.97   22229.4   11801.00
      7    10726.92   81.15    0.529  0.50( 0.48) 0.96   26055.7   11500.00
      8    10150.62   93.25    0.493  0.50( 0.48) 0.97   30540.2   11000.00
      9     9522.41  107.86    0.463  0.50( 0.48) 0.97   37123.0   13000.00
     10     8515.52  125.06    0.433  0.50( 0.49) 0.97   44105.9   11130.00
     11     7833.88  136.86    0.419  0.50( 0.49) 0.97   47774.5   11620.00
     12     6766.76  152.98    0.400  0.50( 0.49) 0.98   52312.0   12400.00
     13     5919.24  164.55    0.386  0.50( 0.49) 0.98   54608.8   12201.00
     14     5306.09  174.03    0.375  0.50( 0.49) 0.98   55897.9   12111.00
     15     4375.96  190.14    0.362  0.50( 0.49) 0.98   57824.9   12261.00
     16     3905.08  199.74    0.357  0.50( 0.49) 0.98   58636.6   10200.00
     17     3339.42  215.41    0.349  0.50( 0.49) 0.98   59874.0   10300.00
     18     3107.47  222.39    0.345  0.50( 0.49) 0.98   60225.1   12010.00
     19     2625.64  243.30    0.334  0.50( 0.49) 0.98   60554.4   12000.00
     20     1632.59  313.18    0.295  0.50( 0.49) 0.98   61224.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   12951.30  Tc(MIN.) =   19.74
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    4285.50

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610505U.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       72.00   23.45  0.50( 0.49) 0.99     153.2   50500.00
    TOTAL AREA(ACRES) =      153.2
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12951.30   19.74    1.123  0.50( 0.49) 0.98    4285.5   50200.00
      2    12868.35   34.85    0.812  0.50( 0.49) 0.98    9198.9   50300.00
      3    12609.84   42.91    0.722  0.50( 0.49) 0.97   12399.3   30510.00
      4    12101.89   52.03    0.651  0.50( 0.49) 0.97   15941.2   30300.00
      5    11705.92   59.54    0.605  0.50( 0.48) 0.97   18737.5   31400.00
      6    11216.41   69.63    0.569  0.50( 0.48) 0.97   22229.4   11801.00
      7    10726.92   81.15    0.529  0.50( 0.48) 0.96   26055.7   11500.00
      8    10150.62   93.25    0.493  0.50( 0.48) 0.97   30540.2   11000.00
      9     9522.41  107.86    0.463  0.50( 0.48) 0.97   37123.0   13000.00
     10     8515.52  125.06    0.433  0.50( 0.49) 0.97   44105.9   11130.00
     11     7833.88  136.86    0.419  0.50( 0.49) 0.97   47774.5   11620.00
     12     6766.76  152.98    0.400  0.50( 0.49) 0.98   52312.0   12400.00
     13     5919.24  164.55    0.386  0.50( 0.49) 0.98   54608.8   12201.00
     14     5306.09  174.03    0.375  0.50( 0.49) 0.98   55897.9   12111.00
     15     4375.96  190.14    0.362  0.50( 0.49) 0.98   57824.9   12261.00
     16     3905.08  199.74    0.357  0.50( 0.49) 0.98   58636.6   10200.00
     17     3339.42  215.41    0.349  0.50( 0.49) 0.98   59874.0   10300.00
     18     3107.47  222.39    0.345  0.50( 0.49) 0.98   60225.1   12010.00
     19     2625.64  243.30    0.334  0.50( 0.49) 0.98   60554.4   12000.00
     20     1632.59  313.18    0.295  0.50( 0.49) 0.98   61224.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       72.00   23.45    1.016  0.50( 0.49) 0.99     153.2   50500.00
  LONGEST FLOWPATH FROM NODE  50500.00 TO NODE  13402.00 =    6247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13023.31   19.74    1.123  0.50( 0.49) 0.98    4414.4   50200.00
      2    13002.93   23.45    1.016  0.50( 0.49) 0.98    5645.8   50500.00
      3    12912.25   34.85    0.812  0.50( 0.49) 0.98    9352.1   50300.00
      4    12641.38   42.91    0.722  0.50( 0.49) 0.97   12552.5   30510.00
      5    12123.67   52.03    0.651  0.50( 0.49) 0.97   16094.4   30300.00
      6    11721.29   59.54    0.605  0.50( 0.48) 0.97   18890.7   31400.00
      7    11226.82   69.63    0.569  0.50( 0.48) 0.97   22382.6   11801.00
      8    10731.89   81.15    0.529  0.50( 0.48) 0.97   26208.9   11500.00
      9    10151.54   93.25    0.493  0.50( 0.48) 0.97   30693.4   11000.00
     10     9523.28  107.86    0.463  0.50( 0.48) 0.97   37276.2   13000.00
     11     8516.34  125.06    0.433  0.50( 0.49) 0.97   44259.1   11130.00
     12     7834.67  136.86    0.419  0.50( 0.49) 0.97   47927.6   11620.00
     13     6767.52  152.98    0.400  0.50( 0.49) 0.98   52465.2   12400.00
     14     5919.96  164.55    0.386  0.50( 0.49) 0.98   54761.9   12201.00
     15     5306.80  174.03    0.375  0.50( 0.49) 0.98   56051.1   12111.00
     16     4376.64  190.14    0.362  0.50( 0.49) 0.98   57978.0   12261.00
     17     3905.76  199.74    0.357  0.50( 0.49) 0.98   58789.8   10200.00
```

```
    18     3340.08  215.41    0.349  0.50( 0.49) 0.98   60027.2   10300.00
    19     3108.12  222.39    0.345  0.50( 0.49) 0.98   60378.3   12010.00
    20     2626.27  243.30    0.334  0.50( 0.49) 0.98   60707.6   12000.00
    21     1633.14  313.18    0.295  0.50( 0.49) 0.98   61377.8   10100.00
   TOTAL AREA(ACRES) =     61377.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    13023.31  Tc(MIN.) =   19.737
  EFFECTIVE AREA(ACRES) =   4414.41  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =    61377.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    209.00  DOWNSTREAM(FEET) =    207.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.35   CHANNEL SLOPE =  0.0051
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   13023.31
  FLOW VELOCITY(FEET/SEC.) =  14.38   FLOW DEPTH(FEET) =  17.38
  TRAVEL TIME(MIN.) =   0.46   Tc(MIN.) =   20.20
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13023.31   20.20    1.107  0.50( 0.49) 0.98    4414.4   50200.00
      2    13002.93   23.91    1.003  0.50( 0.49) 0.98    5645.8   50500.00
      3    12912.25   35.31    0.806  0.50( 0.49) 0.98    9352.1   50300.00
      4    12641.38   43.37    0.718  0.50( 0.49) 0.97   12552.5   30510.00
      5    12123.67   52.50    0.649  0.50( 0.49) 0.97   16094.4   30300.00
      6    11721.29   60.01    0.602  0.50( 0.48) 0.97   18890.7   31400.00
      7    11226.82   70.11    0.567  0.50( 0.48) 0.97   22382.6   11801.00
      8    10731.89   81.63    0.528  0.50( 0.48) 0.97   26208.9   11500.00
      9    10151.54   93.74    0.492  0.50( 0.48) 0.97   30693.4   11000.00
     10     9523.28  108.35    0.462  0.50( 0.48) 0.97   37276.2   13000.00
     11     8516.34  125.57    0.432  0.50( 0.49) 0.97   44259.1   11130.00
     12     7834.67  137.38    0.418  0.50( 0.49) 0.97   47927.6   11620.00
     13     6767.52  153.52    0.399  0.50( 0.49) 0.98   52465.2   12400.00
     14     5919.96  165.11    0.386  0.50( 0.49) 0.98   54761.9   12201.00
     15     5306.80  174.60    0.374  0.50( 0.49) 0.98   56051.1   12111.00
     16     4376.64  190.75    0.362  0.50( 0.49) 0.98   57978.0   12261.00
     17     3905.76  200.36    0.357  0.50( 0.49) 0.98   58789.8   10200.00
     18     3340.08  216.06    0.348  0.50( 0.49) 0.98   60027.2   10300.00
     19     3108.12  223.05    0.345  0.50( 0.49) 0.98   60378.3   12010.00
     20     2626.27  243.99    0.333  0.50( 0.49) 0.98   60707.6   12000.00
     21     1633.14  313.95    0.295  0.50( 0.49) 0.98   61377.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   13023.31  Tc(MIN.) =   20.20
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    4414.41

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610506U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       27.99   19.62  0.50( 0.50) 1.00      49.6   50600.00
    TOTAL AREA(ACRES) =       49.6

****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13023.31   20.20    1.107  0.50( 0.49) 0.98    4414.4   50200.00
      2    13002.93   23.91    1.003  0.50( 0.49) 0.98    5645.8   50500.00
      3    12912.25   35.31    0.806  0.50( 0.49) 0.98    9352.1   50300.00
      4    12641.38   43.37    0.718  0.50( 0.49) 0.97   12552.5   30510.00
      5    12123.67   52.50    0.649  0.50( 0.49) 0.97   16094.4   30300.00
      6    11721.29   60.01    0.602  0.50( 0.48) 0.97   18890.7   31400.00
      7    11226.82   70.11    0.567  0.50( 0.48) 0.97   22382.6   11801.00
      8    10731.89   81.63    0.528  0.50( 0.48) 0.97   26208.9   11500.00
      9    10151.54   93.74    0.492  0.50( 0.48) 0.97   30693.4   11000.00
     10     9523.28  108.35    0.462  0.50( 0.48) 0.97   37276.2   13000.00
     11     8516.34  125.57    0.432  0.50( 0.49) 0.97   44259.1   11130.00
     12     7834.67  137.38    0.418  0.50( 0.49) 0.97   47927.6   11620.00
     13     6767.52  153.52    0.399  0.50( 0.49) 0.98   52465.2   12400.00
     14     5919.96  165.11    0.386  0.50( 0.49) 0.98   54761.9   12201.00
     15     5306.80  174.60    0.374  0.50( 0.49) 0.98   56051.1   12111.00
     16     4376.64  190.75    0.362  0.50( 0.49) 0.98   57978.0   12261.00
     17     3905.76  200.36    0.357  0.50( 0.49) 0.98   58789.8   10200.00
     18     3340.08  216.06    0.348  0.50( 0.49) 0.98   60027.2   10300.00
     19     3108.12  223.05    0.345  0.50( 0.49) 0.98   60378.3   12010.00
     20     2626.27  243.99    0.333  0.50( 0.49) 0.98   60707.6   12000.00
     21     1633.14  313.95    0.295  0.50( 0.49) 0.98   61377.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       27.99   19.62    1.127  0.50( 0.50) 1.00      49.6   50600.00
  LONGEST FLOWPATH FROM NODE  50600.00 TO NODE  13404.00 =    4378.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13051.30   19.62    1.127  0.50( 0.49) 0.98    4339.3   50600.00
      2    13050.42   20.20    1.107  0.50( 0.49) 0.98    4464.0   50200.00
      3    13025.36   23.91    1.003  0.50( 0.49) 0.98    5695.4   50500.00
      4    12925.91   35.31    0.806  0.50( 0.49) 0.98    9401.7   50300.00
      5    12651.12   43.37    0.718  0.50( 0.49) 0.97   12602.1   30510.00
      6    12130.30   52.50    0.649  0.50( 0.49) 0.97   16143.9   30300.00
```

```
      7    11725.83   60.01    0.602  0.50( 0.48) 0.97   18940.3   31400.00
      8    11229.82   70.11    0.567  0.50( 0.48) 0.97   22432.2   11801.00
      9    10733.12   81.63    0.528  0.50( 0.48) 0.97   26258.5   11500.00
     10    10151.54   93.74    0.492  0.50( 0.48) 0.97   30743.0   11000.00
     11     9523.28  108.35    0.462  0.50( 0.48) 0.97   37325.8   13000.00
     12     8516.34  125.57    0.432  0.50( 0.49) 0.97   44308.7   11130.00
     13     7834.67  137.38    0.418  0.50( 0.49) 0.97   47977.2   11620.00
     14     6767.52  153.52    0.399  0.50( 0.49) 0.98   52514.8   12400.00
     15     5919.96  165.11    0.386  0.50( 0.49) 0.98   54811.5   12201.00
     16     5306.80  174.60    0.374  0.50( 0.49) 0.98   56100.7   12111.00
     17     4376.64  190.75    0.362  0.50( 0.49) 0.98   58027.6   12261.00
     18     3905.76  200.36    0.357  0.50( 0.49) 0.98   58839.4   10200.00
     19     3340.08  216.06    0.348  0.50( 0.49) 0.98   60076.8   10300.00
     20     3108.12  223.05    0.345  0.50( 0.49) 0.98   60427.9   12010.00
     21     2626.27  243.99    0.333  0.50( 0.49) 0.98   60757.2   12000.00
     22     1633.14  313.95    0.295  0.50( 0.49) 0.98   61427.4   10100.00
   TOTAL AREA(ACRES) =     61427.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    13051.30  Tc(MIN.) =   19.625
  EFFECTIVE AREA(ACRES) =   4339.30  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =    61427.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13406.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    207.00  DOWNSTREAM(FEET) =    195.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1601.97   CHANNEL SLOPE =  0.0075
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   13051.30
  FLOW VELOCITY(FEET/SEC.) =  16.67   FLOW DEPTH(FEET) =  16.16
  TRAVEL TIME(MIN.) =   1.60   Tc(MIN.) =   21.23
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13051.30   21.23    1.078  0.50( 0.49) 0.98    4339.3   50600.00
      2    13050.42   21.80    1.062  0.50( 0.49) 0.98    4464.0   50200.00
      3    13025.36   25.51    0.962  0.50( 0.49) 0.98    5695.4   50500.00
      4    12925.91   36.92    0.785  0.50( 0.49) 0.98    9401.7   50300.00
      5    12651.12   44.99    0.705  0.50( 0.49) 0.97   12602.1   30510.00
      6    12130.30   54.13    0.638  0.50( 0.49) 0.97   16143.9   30300.00
      7    11725.83   61.66    0.596  0.50( 0.48) 0.97   18940.3   31400.00
      8    11229.82   71.77    0.562  0.50( 0.48) 0.97   22432.2   11801.00
      9    10733.12   83.31    0.522  0.50( 0.48) 0.97   26258.5   11500.00
     10    10151.54   95.44    0.488  0.50( 0.48) 0.97   30743.0   11000.00
     11     9523.28  110.08    0.459  0.50( 0.48) 0.97   37325.8   13000.00
     12     8516.34  127.35    0.430  0.50( 0.49) 0.97   44308.7   11130.00
     13     7834.67  139.20    0.416  0.50( 0.49) 0.97   47977.2   11620.00
     14     6767.52  155.40    0.397  0.50( 0.49) 0.98   52514.8   12400.00
     15     5919.96  167.06    0.383  0.50( 0.49) 0.98   54811.5   12201.00
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     16     5306.80  176.61    0.372  0.50( 0.49) 0.98   56100.7   12111.00
     17     4376.64  192.85    0.361  0.50( 0.49) 0.98   58027.6   12261.00
     18     3905.76  202.52    0.356  0.50( 0.49) 0.98   58839.4   10200.00
     19     3340.08  218.31    0.347  0.50( 0.49) 0.98   60076.8   10300.00
     20     3108.12  225.34    0.343  0.50( 0.49) 0.98   60427.9   12010.00
     21     2626.27  246.38    0.332  0.50( 0.49) 0.98   60757.2   12000.00
     22     1633.14  316.65    0.294  0.50( 0.49) 0.98   61427.4   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   13051.30  Tc(MIN.) =   21.23
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    4339.30

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610211U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       66.92   14.41  0.50( 0.50) 1.00      87.0   21100.00
    TOTAL AREA(ACRES) =       87.0

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13051.30   21.23    1.078  0.50( 0.49) 0.98    4339.3   50600.00
      2    13050.42   21.80    1.062  0.50( 0.49) 0.98    4464.0   50200.00
      3    13025.36   25.51    0.962  0.50( 0.49) 0.98    5695.4   50500.00
      4    12925.91   36.92    0.785  0.50( 0.49) 0.98    9401.7   50300.00
      5    12651.12   44.99    0.705  0.50( 0.49) 0.97   12602.1   30510.00
      6    12130.30   54.13    0.638  0.50( 0.49) 0.97   16143.9   30300.00
      7    11725.83   61.66    0.596  0.50( 0.48) 0.97   18940.3   31400.00
      8    11229.82   71.77    0.562  0.50( 0.48) 0.97   22432.2   11801.00
      9    10733.12   83.31    0.522  0.50( 0.48) 0.97   26258.5   11500.00
     10    10151.54   95.44    0.488  0.50( 0.48) 0.97   30743.0   11000.00
     11     9523.28  110.08    0.459  0.50( 0.48) 0.97   37325.8   13000.00
     12     8516.34  127.35    0.430  0.50( 0.49) 0.97   44308.7   11130.00
     13     7834.67  139.20    0.416  0.50( 0.49) 0.97   47977.2   11620.00
     14     6767.52  155.40    0.397  0.50( 0.49) 0.98   52514.8   12400.00
     15     5919.96  167.06    0.383  0.50( 0.49) 0.98   54811.5   12201.00
     16     5306.80  176.61    0.372  0.50( 0.49) 0.98   56100.7   12111.00
     17     4376.64  192.85    0.361  0.50( 0.49) 0.98   58027.6   12261.00
     18     3905.76  202.52    0.356  0.50( 0.49) 0.98   58839.4   10200.00
     19     3340.08  218.31    0.347  0.50( 0.49) 0.98   60076.8   10300.00
```

```
    20     3108.12  225.34    0.343  0.50( 0.49) 0.98   60427.9   12010.00
    21     2626.27  246.38    0.332  0.50( 0.49) 0.98   60757.2   12000.00
    22     1633.14  316.65    0.294  0.50( 0.49) 0.98   61427.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       66.92   14.41    1.355  0.50( 0.50) 1.00      87.0   21100.00
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  13406.00 =    2859.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13087.25   14.41    1.355  0.50( 0.49) 0.98    3033.6   21100.00
      2    13096.56   21.23    1.078  0.50( 0.49) 0.98    4426.3   50600.00
      3    13094.42   21.80    1.062  0.50( 0.49) 0.98    4551.0   50200.00
      4    13061.50   25.51    0.962  0.50( 0.49) 0.98    5782.4   50500.00
      5    12948.23   36.92    0.785  0.50( 0.49) 0.98    9488.7   50300.00
      6    12667.15   44.99    0.705  0.50( 0.49) 0.97   12689.1   30510.00
      7    12141.11   54.13    0.638  0.50( 0.49) 0.97   16230.9   30300.00
      8    11733.36   61.66    0.596  0.50( 0.48) 0.97   19027.3   31400.00
      9    11234.62   71.77    0.562  0.50( 0.48) 0.97   22519.2   11801.00
     10    10734.82   83.31    0.522  0.50( 0.48) 0.97   26345.5   11500.00
     11    10151.54   95.44    0.488  0.50( 0.48) 0.97   30830.0   11000.00
     12     9523.28  110.08    0.459  0.50( 0.48) 0.97   37412.8   13000.00
     13     8516.34  127.35    0.430  0.50( 0.49) 0.97   44395.7   11130.00
     14     7834.67  139.20    0.416  0.50( 0.49) 0.97   48064.2   11620.00
     15     6767.52  155.40    0.397  0.50( 0.49) 0.98   52601.8   12400.00
     16     5919.96  167.06    0.383  0.50( 0.49) 0.98   54898.5   12201.00
     17     5306.80  176.61    0.372  0.50( 0.49) 0.98   56187.7   12111.00
     18     4376.64  192.85    0.361  0.50( 0.49) 0.98   58114.6   12261.00
     19     3905.76  202.52    0.356  0.50( 0.49) 0.98   58926.4   10200.00
     20     3340.08  218.31    0.347  0.50( 0.49) 0.98   60163.8   10300.00
     21     3108.12  225.34    0.343  0.50( 0.49) 0.98   60514.9   12010.00
     22     2626.27  246.38    0.332  0.50( 0.49) 0.98   60844.2   12000.00
     23     1633.14  316.65    0.294  0.50( 0.49) 0.98   61514.4   10100.00
    TOTAL AREA(ACRES) =     61514.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    13096.56  Tc(MIN.) =   21.227
  EFFECTIVE AREA(ACRES) =   4426.30  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =    61514.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13408.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    195.00  DOWNSTREAM(FEET) =    182.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2458.36   CHANNEL SLOPE =  0.0053
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.999
  SUBAREA LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       12.41      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13099.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.64
  AVERAGE FLOW DEPTH(FEET) =  17.27   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   24.03
  SUBAREA AREA(ACRES) =    12.41       SUBAREA RUNOFF(CFS) =    5.58
  EFFECTIVE AREA(ACRES) =   4438.71     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    61526.8         PEAK FLOW RATE(CFS) =   13096.56
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 17.27   FLOW VELOCITY(FEET/SEC.) =  14.64
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13087.25   17.21    1.218  0.50( 0.49) 0.98    3046.0   21100.00
      2    13096.56   24.03    0.999  0.50( 0.49) 0.98    4438.7   50600.00
      3    13094.42   24.60    0.983  0.50( 0.49) 0.98    4563.4   50200.00
      4    13061.50   28.31    0.907  0.50( 0.49) 0.98    5794.8   50500.00
      5    12948.23   39.73    0.749  0.50( 0.49) 0.98    9501.1   50300.00
      6    12667.15   47.81    0.682  0.50( 0.49) 0.98   12701.5   30510.00
      7    12141.11   56.98    0.621  0.50( 0.49) 0.97   16243.4   30300.00
      8    11733.36   64.54    0.586  0.50( 0.48) 0.97   19039.7   31400.00
      9    11234.62   74.68    0.552  0.50( 0.48) 0.97   22531.6   11801.00
     10    10734.82   86.25    0.512  0.50( 0.48) 0.97   26357.9   11500.00
     11    10151.54   98.43    0.482  0.50( 0.48) 0.97   30842.4   11000.00
     12     9523.28  113.12    0.453  0.50( 0.48) 0.97   37425.2   13000.00
     13     8516.34  130.47    0.427  0.50( 0.49) 0.97   44408.1   11130.00
     14     7834.67  142.39    0.413  0.50( 0.49) 0.97   48076.6   11620.00
     15     6767.52  158.71    0.393  0.50( 0.49) 0.98   52614.2   12400.00
     16     5919.96  170.48    0.379  0.50( 0.49) 0.98   54910.9   12201.00
     17     5306.80  180.12    0.368  0.50( 0.49) 0.98   56200.1   12111.00
     18     4376.64  196.53    0.359  0.50( 0.49) 0.98   58127.1   12261.00
     19     3905.76  206.31    0.354  0.50( 0.49) 0.98   58938.8   10200.00
     20     3340.08  222.25    0.345  0.50( 0.49) 0.98   60176.2   10300.00
     21     3108.12  229.35    0.341  0.50( 0.49) 0.98   60527.3   12010.00
     22     2626.27  250.56    0.330  0.50( 0.49) 0.98   60856.6   12000.00
     23     1633.14  321.35    0.291  0.50( 0.49) 0.98   61526.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   13096.56  Tc(MIN.) =   24.03
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    4438.71

****************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE = 15.1
```

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------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610507U.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      107.76   23.93  0.50( 0.50) 0.99     236.8   50700.00
    TOTAL AREA(ACRES) =      236.8

******************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  11
------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13087.25   17.21    1.218  0.50( 0.49) 0.98    3046.0   21100.00
      2    13096.56   24.03    0.999  0.50( 0.49) 0.98    4438.7   50600.00
      3    13094.42   24.60    0.983  0.50( 0.49) 0.98    4563.4   50200.00
      4    13061.50   28.31    0.907  0.50( 0.49) 0.98    5794.8   50500.00
      5    12948.23   39.73    0.749  0.50( 0.49) 0.98    9501.1   50300.00
      6    12667.15   47.81    0.682  0.50( 0.49) 0.98   12701.5   30510.00
      7    12141.11   56.98    0.621  0.50( 0.49) 0.97   16243.4   30300.00
      8    11733.36   64.54    0.586  0.50( 0.48) 0.97   19039.7   31400.00
      9    11234.62   74.68    0.552  0.50( 0.48) 0.97   22531.6   11801.00
     10    10734.82   86.25    0.512  0.50( 0.48) 0.97   26357.9   11500.00
     11    10151.54   98.43    0.482  0.50( 0.48) 0.97   30842.4   11000.00
     12     9523.28  113.12    0.453  0.50( 0.48) 0.97   37425.2   13000.00
     13     8516.34  130.47    0.427  0.50( 0.49) 0.97   44408.1   11130.00
     14     7834.67  142.39    0.413  0.50( 0.49) 0.97   48076.6   11620.00
     15     6767.52  158.71    0.393  0.50( 0.49) 0.98   52614.2   12400.00
     16     5919.96  170.48    0.379  0.50( 0.49) 0.98   54910.9   12201.00
     17     5306.80  180.12    0.368  0.50( 0.49) 0.98   56200.1   12111.00
     18     4376.64  196.53    0.359  0.50( 0.49) 0.98   58127.1   12261.00
     19     3905.76  206.31    0.354  0.50( 0.49) 0.98   58938.8   10200.00
     20     3340.08  222.25    0.345  0.50( 0.49) 0.98   60176.2   10300.00
     21     3108.12  229.35    0.341  0.50( 0.49) 0.98   60527.3   12010.00
     22     2626.27  250.56    0.330  0.50( 0.49) 0.98   60856.6   12000.00
     23     1633.14  321.35    0.291  0.50( 0.49) 0.98   61526.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      107.76   23.93    1.002  0.50( 0.50) 0.99     236.8   50700.00
  LONGEST FLOWPATH FROM NODE  50700.00 TO NODE  13408.00 =    7903.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13195.00   17.21    1.218  0.50( 0.49) 0.98    3216.4   21100.00
      2    13204.18   23.93    1.002  0.50( 0.49) 0.98    4655.7   50700.00
      3    13203.73   24.03    0.999  0.50( 0.49) 0.98    4675.5   50600.00
      4    13198.16   24.60    0.983  0.50( 0.49) 0.98    4800.2   50200.00
      5    13148.98   28.31    0.907  0.50( 0.49) 0.98    6031.6   50500.00
```



```
      6    13002.14   39.73    0.749  0.50( 0.49) 0.98    9737.9   50300.00
      7    12706.67   47.81    0.682  0.50( 0.49) 0.98   12938.3   30510.00
      8    12167.57   56.98    0.621  0.50( 0.49) 0.97   16480.1   30300.00
      9    11752.51   64.54    0.586  0.50( 0.48) 0.97   19276.5   31400.00
     10    11246.36   74.68    0.552  0.50( 0.48) 0.97   22768.4   11801.00
     11    10738.09   86.25    0.512  0.50( 0.48) 0.97   26594.7   11500.00
     12    10152.29   98.43    0.482  0.50( 0.48) 0.97   31079.2   11000.00
     13     9523.98  113.12    0.453  0.50( 0.48) 0.97   37662.0   13000.00
     14     8517.00  130.47    0.427  0.50( 0.49) 0.97   44644.9   11130.00
     15     7835.31  142.39    0.413  0.50( 0.49) 0.97   48313.4   11620.00
     16     6768.13  158.71    0.393  0.50( 0.49) 0.98   52851.0   12400.00
     17     5920.55  170.48    0.379  0.50( 0.49) 0.98   55147.7   12201.00
     18     5307.37  180.12    0.368  0.50( 0.49) 0.98   56436.9   12111.00
     19     4377.20  196.53    0.359  0.50( 0.49) 0.98   58363.8   12261.00
     20     3906.31  206.31    0.354  0.50( 0.49) 0.98   59175.6   10200.00
     21     3340.62  222.25    0.345  0.50( 0.49) 0.98   60413.0   10300.00
     22     3108.65  229.35    0.341  0.50( 0.49) 0.98   60764.1   12010.00
     23     2626.79  250.56    0.330  0.50( 0.49) 0.98   61093.4   12000.00
     24     1633.60  321.35    0.291  0.50( 0.49) 0.98   61763.6   10100.00
   TOTAL AREA(ACRES) =     61763.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    13204.18  Tc(MIN.) =   23.929
  EFFECTIVE AREA(ACRES) =   4655.70  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =    61763.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13410.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    182.00  DOWNSTREAM(FEET) =    178.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =   952.73   CHANNEL SLOPE =  0.0034
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.968
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.31      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13204.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.49
  AVERAGE FLOW DEPTH(FEET) =  18.77   TRAVEL TIME(MIN.) =   1.27
  Tc(MIN.) =   25.20
  SUBAREA AREA(ACRES) =     3.31       SUBAREA RUNOFF(CFS) =    1.39
  EFFECTIVE AREA(ACRES) =   4659.01     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    61766.9         PEAK FLOW RATE(CFS) =   13204.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 18.77   FLOW VELOCITY(FEET/SEC.) =  12.49
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13410.00 =  124122.09 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13195.00	18.49	1.170	0.50(0.49)	0.98	3219.7	21100.00
2	13204.18	25.20	0.968	0.50(0.49)	0.98	4659.0	50700.00
3	13203.73	25.30	0.966	0.50(0.49)	0.98	4678.8	50600.00
4	13198.16	25.87	0.955	0.50(0.49)	0.98	4803.5	50200.00
5	13148.98	29.59	0.882	0.50(0.49)	0.98	6034.9	50500.00
6	13002.14	41.00	0.738	0.50(0.49)	0.98	9741.2	50300.00
7	12706.67	49.09	0.671	0.50(0.49)	0.98	12941.6	30510.00
8	12167.57	58.28	0.613	0.50(0.49)	0.97	16483.5	30300.00
9	11752.51	65.84	0.582	0.50(0.48)	0.97	19279.8	31400.00
10	11246.36	76.01	0.547	0.50(0.48)	0.97	22771.7	11801.00
11	10738.09	87.59	0.507	0.50(0.48)	0.97	26598.0	11500.00
12	10152.29	99.78	0.479	0.50(0.48)	0.97	31082.5	11000.00
13	9523.98	114.50	0.450	0.50(0.48)	0.97	37665.3	13000.00
14	8517.00	131.89	0.425	0.50(0.49)	0.97	44648.2	11130.00
15	7835.31	143.83	0.411	0.50(0.49)	0.97	48316.7	11620.00
16	6768.13	160.21	0.391	0.50(0.49)	0.98	52854.3	12400.00
17	5920.55	172.03	0.377	0.50(0.49)	0.98	55151.0	12201.00
18	5307.37	181.72	0.367	0.50(0.49)	0.98	56440.2	12111.00
19	4377.20	198.21	0.358	0.50(0.49)	0.98	58367.1	12261.00
20	3906.31	208.03	0.353	0.50(0.49)	0.98	59178.9	10200.00
21	3340.62	224.04	0.344	0.50(0.49)	0.98	60416.3	10300.00
22	3108.65	231.17	0.340	0.50(0.49)	0.98	60767.4	12010.00
23	2626.79	252.47	0.329	0.50(0.49)	0.98	61096.7	12000.00
24	1633.60	323.50	0.290	0.50(0.49)	0.98	61766.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 13204.18 Tc(MIN.) = 25.20
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 4659.01

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S36.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	873.05	23.93	0.50(0.49)	0.99	1142.2	21000.00
2	865.80	27.24	0.50(0.49)	0.99	1320.4	20810.00
3	863.12	27.83	0.50(0.49)	0.99	1357.1	20900.00
4	840.65	31.47	0.50(0.49)	0.99	1565.3	20800.00
5	819.02	34.25	0.50(0.49)	0.99	1709.6	20700.00
6	730.28	44.42	0.50(0.49)	0.99	2232.9	20600.00
7	676.78	50.96	0.50(0.50)	0.99	2534.9	20500.00
8	628.43	54.75	0.50(0.49)	0.99	2645.0	20400.00
9	618.60	55.38	0.50(0.49)	0.99	2658.9	20300.00
10	558.93	59.07	0.50(0.49)	0.99	2727.6	20200.00

11	555.67	59.27	0.50(0.49)	0.99	2731.8	20210.00
12	510.75	62.10	0.50(0.49)	0.99	2786.3	20100.00
13	439.02	68.14	0.50(0.49)	0.99	2895.7	13600.00
14	113.35	140.26	0.50(0.49)	0.98	3986.0	13510.00
15	59.39	170.09	0.50(0.49)	0.97	4067.7	13500.00

TOTAL AREA(ACRES) = 4067.7

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13195.00	18.49	1.170	0.50(0.49)	0.98	3219.7	21100.00
2	13204.18	25.20	0.968	0.50(0.49)	0.98	4659.0	50700.00
3	13203.73	25.30	0.966	0.50(0.49)	0.98	4678.8	50600.00
4	13198.16	25.87	0.955	0.50(0.49)	0.98	4803.5	50200.00
5	13148.98	29.59	0.882	0.50(0.49)	0.98	6034.9	50500.00
6	13002.14	41.00	0.738	0.50(0.49)	0.98	9741.2	50300.00
7	12706.67	49.09	0.671	0.50(0.49)	0.98	12941.6	30510.00
8	12167.57	58.28	0.613	0.50(0.49)	0.97	16483.5	30300.00
9	11752.51	65.84	0.582	0.50(0.48)	0.97	19279.8	31400.00
10	11246.36	76.01	0.547	0.50(0.48)	0.97	22771.7	11801.00
11	10738.09	87.59	0.507	0.50(0.48)	0.97	26598.0	11500.00
12	10152.29	99.78	0.479	0.50(0.48)	0.97	31082.5	11000.00
13	9523.98	114.50	0.450	0.50(0.48)	0.97	37665.3	13000.00
14	8517.00	131.89	0.425	0.50(0.49)	0.97	44648.2	11130.00
15	7835.31	143.83	0.411	0.50(0.49)	0.97	48316.7	11620.00
16	6768.13	160.21	0.391	0.50(0.49)	0.98	52854.3	12400.00
17	5920.55	172.03	0.377	0.50(0.49)	0.98	55151.0	12201.00
18	5307.37	181.72	0.367	0.50(0.49)	0.98	56440.2	12111.00
19	4377.20	198.21	0.358	0.50(0.49)	0.98	58367.1	12261.00
20	3906.31	208.03	0.353	0.50(0.49)	0.98	59178.9	10200.00
21	3340.62	224.04	0.344	0.50(0.49)	0.98	60416.3	10300.00
22	3108.65	231.17	0.340	0.50(0.49)	0.98	60767.4	12010.00
23	2626.79	252.47	0.329	0.50(0.49)	0.98	61096.7	12000.00
24	1633.60	323.50	0.290	0.50(0.49)	0.98	61766.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	873.05	23.93	1.002	0.50(0.49)	0.99	1142.2	21000.00
2	865.80	27.24	0.928	0.50(0.49)	0.99	1320.4	20810.00
3	863.12	27.83	0.917	0.50(0.49)	0.99	1357.1	20900.00
4	840.65	31.47	0.855	0.50(0.49)	0.99	1565.3	20800.00
5	819.02	34.25	0.820	0.50(0.49)	0.99	1709.6	20700.00
6	730.28	44.42	0.710	0.50(0.49)	0.99	2232.9	20600.00
7	676.78	50.96	0.658	0.50(0.50)	0.99	2534.9	20500.00
8	628.43	54.75	0.635	0.50(0.49)	0.99	2645.0	20400.00
9	618.60	55.38	0.631	0.50(0.49)	0.99	2658.9	20300.00
10	558.93	59.07	0.608	0.50(0.49)	0.99	2727.6	20200.00
11	555.67	59.27	0.607	0.50(0.49)	0.99	2731.8	20210.00
12	510.75	62.10	0.595	0.50(0.49)	0.99	2786.3	20100.00
13	439.02	68.14	0.574	0.50(0.49)	0.99	2895.7	13600.00

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    14      113.35  140.26    0.415  0.50( 0.49) 0.98    3986.0   13510.00
    15       59.39  170.09    0.380  0.50( 0.49) 0.97    4067.7   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13410.00 =   40827.58 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14068.05   18.49    1.170  0.50( 0.49) 0.98    4102.1   21100.00
      2    14075.49   23.93    1.002  0.50( 0.49) 0.98    5528.8   21000.00
      3    14074.44   25.20    0.968  0.50( 0.49) 0.98    5869.7   50700.00
      4    14073.78   25.30    0.966  0.50( 0.49) 0.98    5894.7   50600.00
      5    14066.96   25.87    0.955  0.50( 0.49) 0.98    6050.1   50200.00
      6    14045.84   27.24    0.928  0.50( 0.49) 0.98    6577.7   20810.00
      7    14035.32   27.83    0.917  0.50( 0.49) 0.98    6810.6   20900.00
      8    14001.27   29.59    0.882  0.50( 0.49) 0.98    7492.3   50500.00
      9    13965.37   31.47    0.855  0.50( 0.49) 0.98    8212.6   20800.00
     10    13907.98   34.25    0.820  0.50( 0.49) 0.98    9259.5   20700.00
     11    13762.23   41.00    0.738  0.50( 0.49) 0.98   11798.2   50300.00
     12    13607.68   44.42    0.710  0.50( 0.49) 0.98   13325.2   20600.00
     13    13398.70   49.09    0.671  0.50( 0.49) 0.98   15390.4   30510.00
     14    13274.02   50.96    0.658  0.50( 0.49) 0.98   16195.5   20500.00
     15    13003.25   54.75    0.635  0.50( 0.49) 0.98   17766.8   20400.00
     16    12956.60   55.38    0.631  0.50( 0.49) 0.97   18022.6   20300.00
     17    12739.30   58.28    0.613  0.50( 0.49) 0.97   19196.3   30300.00
     18    12683.01   59.07    0.608  0.50( 0.49) 0.97   19504.1   20200.00
     19    12669.05   59.27    0.607  0.50( 0.49) 0.97   19580.4   20210.00
     20    12468.63   62.10    0.595  0.50( 0.49) 0.97   20682.5   20100.00
     21    12218.78   65.84    0.582  0.50( 0.49) 0.97   22133.9   31400.00
     22    12077.33   68.14    0.574  0.50( 0.49) 0.97   22963.3   13600.00
     23    11649.84   76.01    0.547  0.50( 0.48) 0.97   25786.3   11801.00
     24    11089.25   87.59    0.507  0.50( 0.48) 0.97   29787.8   11500.00
     25    10448.40   99.78    0.479  0.50( 0.48) 0.97   34456.6   11000.00
     26     9753.66  114.50    0.450  0.50( 0.49) 0.97   41261.8   13000.00
     27     8668.13  131.89    0.425  0.50( 0.49) 0.97   48507.7   11130.00
     28     8152.90  140.26    0.415  0.50( 0.49) 0.97   51203.6   13510.00
     29     7942.19  143.83    0.411  0.50( 0.49) 0.97   52312.6   11620.00
     30     6845.40  160.21    0.391  0.50( 0.49) 0.98   56895.0   12400.00
     31     6118.89  170.09    0.380  0.50( 0.49) 0.98   58842.3   13500.00
     32     5979.59  172.03    0.377  0.50( 0.49) 0.98   59218.8   12201.00
     33     5364.79  181.72    0.367  0.50( 0.49) 0.98   60507.9   12111.00
     34     4433.21  198.21    0.358  0.50( 0.49) 0.98   62434.9   12261.00
     35     3961.48  208.03    0.353  0.50( 0.49) 0.98   63246.7   10200.00
     36     3394.42  224.04    0.344  0.50( 0.49) 0.98   64484.0   10300.00
     37     3161.86  231.17    0.340  0.50( 0.49) 0.98   64835.1   12010.00
     38     2678.17  252.47    0.329  0.50( 0.49) 0.98   65164.4   12000.00
     39     1678.94  323.50    0.290  0.50( 0.49) 0.98   65834.6   10100.00
    TOTAL AREA(ACRES) =     65834.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    14075.49  Tc(MIN.) =   23.929
  EFFECTIVE AREA(ACRES) =   5528.79  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    65834.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13410.00 =  124122.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13410.00 TO NODE  13412.00 IS CODE =  51
----------------------------------------------------------------------------
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```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    178.72  DOWNSTREAM(FEET) =    176.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   169.78   CHANNEL SLOPE =  0.0105
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   14075.49
  FLOW VELOCITY(FEET/SEC.) =  19.30   FLOW DEPTH(FEET) =  15.59
  TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =   24.08
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13412.00 =  124291.87 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14068.05   18.63    1.165  0.50( 0.49) 0.98    4102.1   21100.00
      2    14075.49   24.08    0.998  0.50( 0.49) 0.98    5528.8   21000.00
      3    14074.44   25.35    0.965  0.50( 0.49) 0.98    5869.7   50700.00
      4    14073.78   25.44    0.963  0.50( 0.49) 0.98    5894.7   50600.00
      5    14066.96   26.01    0.952  0.50( 0.49) 0.98    6050.1   50200.00
      6    14045.84   27.39    0.925  0.50( 0.49) 0.98    6577.7   20810.00
      7    14035.32   27.98    0.914  0.50( 0.49) 0.98    6810.6   20900.00
      8    14001.27   29.73    0.879  0.50( 0.49) 0.98    7492.3   50500.00
      9    13965.37   31.62    0.853  0.50( 0.49) 0.98    8212.6   20800.00
     10    13907.98   34.40    0.818  0.50( 0.49) 0.98    9259.5   20700.00
     11    13762.23   41.15    0.737  0.50( 0.49) 0.98   11798.2   50300.00
     12    13607.68   44.57    0.709  0.50( 0.49) 0.98   13325.2   20600.00
     13    13398.70   49.24    0.670  0.50( 0.49) 0.98   15390.4   30510.00
     14    13274.02   51.11    0.657  0.50( 0.49) 0.98   16195.5   20500.00
     15    13003.25   54.90    0.634  0.50( 0.49) 0.98   17766.8   20400.00
     16    12956.60   55.53    0.630  0.50( 0.49) 0.97   18022.6   20300.00
     17    12739.30   58.43    0.612  0.50( 0.49) 0.97   19196.3   30300.00
     18    12683.01   59.22    0.607  0.50( 0.49) 0.97   19504.1   20200.00
     19    12669.05   59.42    0.606  0.50( 0.49) 0.97   19580.4   20210.00
     20    12468.63   62.25    0.594  0.50( 0.49) 0.97   20682.5   20100.00
     21    12218.78   66.00    0.581  0.50( 0.49) 0.97   22133.9   31400.00
     22    12077.33   68.29    0.574  0.50( 0.49) 0.97   22963.3   13600.00
     23    11649.84   76.16    0.547  0.50( 0.48) 0.97   25786.3   11801.00
     24    11089.25   87.75    0.507  0.50( 0.48) 0.97   29787.8   11500.00
     25    10448.40   99.94    0.479  0.50( 0.48) 0.97   34456.6   11000.00
     26     9753.66  114.66    0.450  0.50( 0.49) 0.97   41261.8   13000.00
     27     8668.13  132.05    0.425  0.50( 0.49) 0.97   48507.7   11130.00
     28     8152.90  140.42    0.415  0.50( 0.49) 0.97   51203.6   13510.00
     29     7942.19  144.00    0.411  0.50( 0.49) 0.97   52312.6   11620.00
     30     6845.40  160.38    0.391  0.50( 0.49) 0.98   56895.0   12400.00
     31     6118.89  170.27    0.380  0.50( 0.49) 0.98   58842.3   13500.00
     32     5979.59  172.21    0.377  0.50( 0.49) 0.98   59218.8   12201.00
     33     5364.79  181.90    0.367  0.50( 0.49) 0.98   60507.9   12111.00
     34     4433.21  198.40    0.358  0.50( 0.49) 0.98   62434.9   12261.00
     35     3961.48  208.23    0.353  0.50( 0.49) 0.98   63246.7   10200.00
     36     3394.42  224.25    0.344  0.50( 0.49) 0.98   64484.0   10300.00
     37     3161.86  231.39    0.340  0.50( 0.49) 0.98   64835.1   12010.00
     38     2678.17  252.69    0.328  0.50( 0.49) 0.98   65164.4   12000.00
     39     1678.94  323.75    0.290  0.50( 0.49) 0.98   65834.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14075.49  Tc(MIN.) =   24.08
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    5528.79
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****************************************************************************
  FLOW PROCESS FROM NODE  13412.00 TO NODE  13412.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13412.00 TO NODE  13412.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509101U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      123.72   47.22  0.50( 0.50) 1.00     585.7   10100.00
    TOTAL AREA(ACRES) =      585.7

****************************************************************************
  FLOW PROCESS FROM NODE  13412.00 TO NODE  13412.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14068.05   18.63    1.165  0.50( 0.49) 0.98    4102.1   21100.00
      2    14075.49   24.08    0.998  0.50( 0.49) 0.98    5528.8   21000.00
      3    14074.44   25.35    0.965  0.50( 0.49) 0.98    5869.7   50700.00
      4    14073.78   25.44    0.963  0.50( 0.49) 0.98    5894.7   50600.00
      5    14066.96   26.01    0.952  0.50( 0.49) 0.98    6050.1   50200.00
      6    14045.84   27.39    0.925  0.50( 0.49) 0.98    6577.7   20810.00
      7    14035.32   27.98    0.914  0.50( 0.49) 0.98    6810.6   20900.00
      8    14001.27   29.73    0.879  0.50( 0.49) 0.98    7492.3   50500.00
      9    13965.37   31.62    0.853  0.50( 0.49) 0.98    8212.6   20800.00
     10    13907.98   34.40    0.818  0.50( 0.49) 0.98    9259.5   20700.00
     11    13762.23   41.15    0.737  0.50( 0.49) 0.98   11798.2   50300.00
     12    13607.68   44.57    0.709  0.50( 0.49) 0.98   13325.2   20600.00
     13    13398.70   49.24    0.670  0.50( 0.49) 0.98   15390.4   30510.00
     14    13274.02   51.11    0.657  0.50( 0.49) 0.98   16195.5   20500.00
     15    13003.25   54.90    0.634  0.50( 0.49) 0.98   17766.8   20400.00
     16    12956.60   55.53    0.630  0.50( 0.49) 0.97   18022.6   20300.00
     17    12739.30   58.43    0.612  0.50( 0.49) 0.97   19196.3   30300.00
     18    12683.01   59.22    0.607  0.50( 0.49) 0.97   19504.1   20200.00
     19    12669.05   59.42    0.606  0.50( 0.49) 0.97   19580.4   20210.00
     20    12468.63   62.25    0.594  0.50( 0.49) 0.97   20682.5   20100.00
     21    12218.78   66.00    0.581  0.50( 0.49) 0.97   22133.9   31400.00
     22    12077.33   68.29    0.574  0.50( 0.49) 0.97   22963.3   13600.00
     23    11649.84   76.16    0.547  0.50( 0.48) 0.97   25786.3   11801.00
     24    11089.25   87.75    0.507  0.50( 0.48) 0.97   29787.8   11500.00
     25    10448.40   99.94    0.479  0.50( 0.48) 0.97   34456.6   11000.00
     26     9753.66  114.66    0.450  0.50( 0.49) 0.97   41261.8   13000.00
     27     8668.13  132.05    0.425  0.50( 0.49) 0.97   48507.7   11130.00
     28     8152.90  140.42    0.415  0.50( 0.49) 0.97   51203.6   13510.00
     29     7942.19  144.00    0.411  0.50( 0.49) 0.97   52312.6   11620.00
     30     6845.40  160.38    0.391  0.50( 0.49) 0.98   56895.0   12400.00
```



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     31     6118.89  170.27    0.380  0.50( 0.49) 0.98   58842.3   13500.00
     32     5979.59  172.21    0.377  0.50( 0.49) 0.98   59218.8   12201.00
     33     5364.79  181.90    0.367  0.50( 0.49) 0.98   60507.9   12111.00
     34     4433.21  198.40    0.358  0.50( 0.49) 0.98   62434.9   12261.00
     35     3961.48  208.23    0.353  0.50( 0.49) 0.98   63246.7   10200.00
     36     3394.42  224.25    0.344  0.50( 0.49) 0.98   64484.0   10300.00
     37     3161.86  231.39    0.340  0.50( 0.49) 0.98   64835.1   12010.00
     38     2678.17  252.69    0.328  0.50( 0.49) 0.98   65164.4   12000.00
     39     1678.94  323.75    0.290  0.50( 0.49) 0.98   65834.6   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13412.00 =  124291.87 FEET.

** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM       Q      Tc    Intensity   Fp(Fm)      Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      123.72   47.22    0.687  0.50( 0.50) 1.00     585.7   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13412.00 =   14724.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc    Intensity   Fp(Fm)      Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    14191.77   18.63    1.165  0.50( 0.49) 0.98    4333.2   21100.00
    2    14199.21   24.08    0.998  0.50( 0.49) 0.98    5827.4   21000.00
    3    14198.16   25.35    0.965  0.50( 0.49) 0.98    6184.0   50700.00
    4    14197.50   25.44    0.963  0.50( 0.49) 0.98    6210.3   50600.00
    5    14190.68   26.01    0.952  0.50( 0.49) 0.98    6372.8   50200.00
    6    14169.55   27.39    0.925  0.50( 0.49) 0.98    6917.4   20810.00
    7    14159.04   27.98    0.914  0.50( 0.49) 0.98    7157.7   20900.00
    8    14124.99   29.73    0.879  0.50( 0.49) 0.98    7861.1   50500.00
    9    14089.08   31.62    0.853  0.50( 0.49) 0.98    8604.8   20800.00
   10    14031.69   34.40    0.818  0.50( 0.49) 0.98    9686.2   20700.00
   11    13885.95   41.15    0.737  0.50( 0.49) 0.98   12308.6   50300.00
   12    13731.40   44.57    0.709  0.50( 0.49) 0.98   13877.9   20600.00
   13    13612.64   47.22    0.687  0.50( 0.49) 0.98   15084.5   10100.00
   14    13511.44   49.24    0.670  0.50( 0.49) 0.98   15976.1   30510.00
   15    13378.08   51.11    0.657  0.50( 0.49) 0.98   16781.2   20500.00
   16    13091.73   54.90    0.634  0.50( 0.49) 0.98   18352.5   20400.00
   17    13042.50   55.53    0.630  0.50( 0.49) 0.98   18608.3   20300.00
   18    12813.25   58.43    0.612  0.50( 0.49) 0.97   19782.1   30300.00
   19    12753.70   59.22    0.607  0.50( 0.49) 0.97   20089.9   20200.00
   20    12738.94   59.42    0.606  0.50( 0.49) 0.97   20166.1   20210.00
   21    12531.00   62.25    0.594  0.50( 0.49) 0.97   21268.2   20100.00
   22    12272.63   66.00    0.581  0.50( 0.49) 0.97   22719.6   31400.00
   23    12125.97   68.29    0.574  0.50( 0.49) 0.97   23549.0   13600.00
   24    11680.56   76.16    0.547  0.50( 0.48) 0.97   26372.0   11801.00
   25    11093.58   87.75    0.507  0.50( 0.48) 0.97   30373.6   11500.00
   26    10448.40   99.94    0.479  0.50( 0.48) 0.97   35042.4   11000.00
   27     9753.66  114.66    0.450  0.50( 0.49) 0.97   41847.6   13000.00
   28     8668.13  132.05    0.425  0.50( 0.49) 0.97   49093.4   11130.00
   29     8152.90  140.42    0.415  0.50( 0.49) 0.97   51789.4   13510.00
   30     7942.19  144.00    0.411  0.50( 0.49) 0.98   52898.3   11620.00
   31     6845.40  160.38    0.391  0.50( 0.49) 0.98   57480.7   12400.00
   32     6118.89  170.27    0.380  0.50( 0.49) 0.98   59428.0   13500.00
   33     5979.59  172.21    0.377  0.50( 0.49) 0.98   59804.5   12201.00
   34     5364.79  181.90    0.367  0.50( 0.49) 0.98   61093.7   12111.00
   35     4433.21  198.40    0.358  0.50( 0.49) 0.98   63020.6   12261.00
   36     3961.48  208.23    0.353  0.50( 0.49) 0.98   63832.4   10200.00
   37     3394.42  224.25    0.344  0.50( 0.49) 0.98   65069.7   10300.00
   38     3161.86  231.39    0.340  0.50( 0.49) 0.98   65420.8   12010.00
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     39     2678.17  252.69    0.328  0.50( 0.49) 0.98   65750.2   12000.00
     40     1678.94  323.75    0.290  0.50( 0.49) 0.98   66420.4   10100.00
    TOTAL AREA(ACRES) =     66420.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    14199.21  Tc(MIN.) =   24.076
  EFFECTIVE AREA(ACRES) =   5827.41  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =    66420.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13412.00 =  124291.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13412.00 TO NODE  13700.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    176.93  DOWNSTREAM(FEET) =    173.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   260.10   CHANNEL SLOPE =  0.0151
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   14199.21
  FLOW VELOCITY(FEET/SEC.) =  22.14   FLOW DEPTH(FEET) =  14.62
  TRAVEL TIME(MIN.) =   0.20   Tc(MIN.) =   24.27
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13700.00 =  124551.97 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14191.77   18.83    1.157  0.50( 0.49) 0.98    4333.2   21100.00
      2    14199.21   24.27    0.993  0.50( 0.49) 0.98    5827.4   21000.00
      3    14198.16   25.54    0.961  0.50( 0.49) 0.98    6184.0   50700.00
      4    14197.50   25.64    0.959  0.50( 0.49) 0.98    6210.3   50600.00
      5    14190.68   26.21    0.948  0.50( 0.49) 0.98    6372.8   50200.00
      6    14169.55   27.58    0.921  0.50( 0.49) 0.98    6917.4   20810.00
      7    14159.04   28.17    0.910  0.50( 0.49) 0.98    7157.7   20900.00
      8    14124.99   29.93    0.875  0.50( 0.49) 0.98    7861.1   50500.00
      9    14089.08   31.82    0.851  0.50( 0.49) 0.98    8604.8   20800.00
     10    14031.69   34.60    0.815  0.50( 0.49) 0.98    9686.2   20700.00
     11    13885.95   41.35    0.735  0.50( 0.49) 0.98   12308.6   50300.00
     12    13731.40   44.76    0.707  0.50( 0.49) 0.98   13877.9   20600.00
     13    13612.64   47.42    0.685  0.50( 0.49) 0.98   15084.5   10100.00
     14    13511.44   49.44    0.669  0.50( 0.49) 0.98   15976.1   30510.00
     15    13378.08   51.31    0.656  0.50( 0.49) 0.98   16781.2   20500.00
     16    13091.73   55.10    0.632  0.50( 0.49) 0.98   18352.5   20400.00
     17    13042.50   55.73    0.628  0.50( 0.49) 0.98   18608.3   20300.00
     18    12813.25   58.63    0.610  0.50( 0.49) 0.97   19782.1   30300.00
     19    12753.70   59.43    0.606  0.50( 0.49) 0.97   20089.9   20200.00
     20    12738.94   59.62    0.604  0.50( 0.49) 0.97   20166.1   20210.00
     21    12531.00   62.46    0.594  0.50( 0.49) 0.97   21268.2   20100.00
     22    12272.63   66.20    0.581  0.50( 0.49) 0.97   22719.6   31400.00
     23    12125.97   68.49    0.573  0.50( 0.49) 0.97   23549.0   13600.00
     24    11680.56   76.36    0.546  0.50( 0.48) 0.97   26372.0   11801.00
     25    11093.58   87.96    0.506  0.50( 0.48) 0.97   30373.6   11500.00
     26    10448.40  100.15    0.479  0.50( 0.48) 0.97   35042.4   11000.00
     27     9753.66  114.87    0.449  0.50( 0.49) 0.97   41847.6   13000.00
     28     8668.13  132.28    0.424  0.50( 0.49) 0.97   49093.4   11130.00
     29     8152.90  140.65    0.415  0.50( 0.49) 0.97   51789.4   13510.00
```



```
     30     7942.19  144.23    0.410  0.50( 0.49) 0.98   52898.3   11620.00
     31     6845.40  160.62    0.391  0.50( 0.49) 0.98   57480.7   12400.00
     32     6118.89  170.52    0.379  0.50( 0.49) 0.98   59428.0   13500.00
     33     5979.59  172.46    0.377  0.50( 0.49) 0.98   59804.5   12201.00
     34     5364.79  182.15    0.367  0.50( 0.49) 0.98   61093.7   12111.00
     35     4433.21  198.67    0.358  0.50( 0.49) 0.98   63020.6   12261.00
     36     3961.48  208.50    0.352  0.50( 0.49) 0.98   63832.4   10200.00
     37     3394.42  224.53    0.344  0.50( 0.49) 0.98   65069.7   10300.00
     38     3161.86  231.67    0.340  0.50( 0.49) 0.98   65420.8   12010.00
     39     2678.17  252.99    0.328  0.50( 0.49) 0.98   65750.2   12000.00
     40     1678.94  324.08    0.290  0.50( 0.49) 0.98   66420.4   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14199.21  Tc(MIN.) =   24.27
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    5827.41

****************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610508U.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       59.14   24.23  0.50( 0.49) 0.99     131.3   50800.00
    TOTAL AREA(ACRES) =      131.3

****************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14191.77   18.83    1.157  0.50( 0.49) 0.98    4333.2   21100.00
      2    14199.21   24.27    0.993  0.50( 0.49) 0.98    5827.4   21000.00
      3    14198.16   25.54    0.961  0.50( 0.49) 0.98    6184.0   50700.00
      4    14197.50   25.64    0.959  0.50( 0.49) 0.98    6210.3   50600.00
      5    14190.68   26.21    0.948  0.50( 0.49) 0.98    6372.8   50200.00
      6    14169.55   27.58    0.921  0.50( 0.49) 0.98    6917.4   20810.00
      7    14159.04   28.17    0.910  0.50( 0.49) 0.98    7157.7   20900.00
      8    14124.99   29.93    0.875  0.50( 0.49) 0.98    7861.1   50500.00
      9    14089.08   31.82    0.851  0.50( 0.49) 0.98    8604.8   20800.00
     10    14031.69   34.60    0.815  0.50( 0.49) 0.98    9686.2   20700.00
     11    13885.95   41.35    0.735  0.50( 0.49) 0.98   12308.6   50300.00
     12    13731.40   44.76    0.707  0.50( 0.49) 0.98   13877.9   20600.00
     13    13612.64   47.42    0.685  0.50( 0.49) 0.98   15084.5   10100.00
     14    13511.44   49.44    0.669  0.50( 0.49) 0.98   15976.1   30510.00
     15    13378.08   51.31    0.656  0.50( 0.49) 0.98   16781.2   20500.00
```

16	13091.73	55.10	0.632	0.50(0.49)	0.98	18352.5	20400.00
17	13042.50	55.73	0.628	0.50(0.49)	0.98	18608.3	20300.00
18	12813.25	58.63	0.610	0.50(0.49)	0.97	19782.1	30300.00
19	12753.70	59.43	0.606	0.50(0.49)	0.97	20089.9	20200.00
20	12738.94	59.62	0.604	0.50(0.49)	0.97	20166.1	20210.00
21	12531.00	62.46	0.594	0.50(0.49)	0.97	21268.2	20100.00
22	12272.63	66.20	0.581	0.50(0.49)	0.97	22719.6	31400.00
23	12125.97	68.49	0.573	0.50(0.49)	0.97	23549.0	13600.00
24	11680.56	76.36	0.546	0.50(0.48)	0.97	26372.0	11801.00
25	11093.58	87.96	0.506	0.50(0.48)	0.97	30373.6	11500.00
26	10448.40	100.15	0.479	0.50(0.48)	0.97	35042.4	11000.00
27	9753.66	114.87	0.449	0.50(0.49)	0.97	41847.6	13000.00
28	8668.13	132.28	0.424	0.50(0.49)	0.97	49093.4	11130.00
29	8152.90	140.65	0.415	0.50(0.49)	0.97	51789.4	13510.00
30	7942.19	144.23	0.410	0.50(0.49)	0.98	52898.3	11620.00
31	6845.40	160.62	0.391	0.50(0.49)	0.98	57480.7	12400.00
32	6118.89	170.52	0.379	0.50(0.49)	0.98	59428.0	13500.00
33	5979.59	172.46	0.377	0.50(0.49)	0.98	59804.5	12201.00
34	5364.79	182.15	0.367	0.50(0.49)	0.98	61093.7	12111.00
35	4433.21	198.67	0.358	0.50(0.49)	0.98	63020.6	12261.00
36	3961.48	208.50	0.352	0.50(0.49)	0.98	63832.4	10200.00
37	3394.42	224.53	0.344	0.50(0.49)	0.98	65069.7	10300.00
38	3161.86	231.67	0.340	0.50(0.49)	0.98	65420.8	12010.00
39	2678.17	252.99	0.328	0.50(0.49)	0.98	65750.2	12000.00
40	1678.94	324.08	0.290	0.50(0.49)	0.98	66420.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	59.14	24.23	0.994	0.50(0.49)	0.99	131.3	50800.00

LONGEST FLOWPATH FROM NODE 50800.00 TO NODE 13700.00 = 5946.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14250.91	18.83	1.157	0.50(0.49)	0.98	4435.2	21100.00
2	14258.29	24.23	0.994	0.50(0.49)	0.98	5947.5	50800.00
3	14258.21	24.27	0.993	0.50(0.49)	0.98	5958.7	21000.00
4	14253.47	25.54	0.961	0.50(0.49)	0.98	6315.3	50700.00
5	14252.59	25.64	0.959	0.50(0.49)	0.98	6341.5	50600.00
6	14244.44	26.21	0.948	0.50(0.49)	0.98	6504.1	50200.00
7	14220.13	27.58	0.921	0.50(0.49)	0.98	7048.6	20810.00
8	14208.24	28.17	0.910	0.50(0.49)	0.98	7288.9	20900.00
9	14170.12	29.93	0.875	0.50(0.49)	0.98	7992.4	50500.00
10	14131.29	31.82	0.851	0.50(0.49)	0.98	8736.0	20800.00
11	14069.69	34.60	0.815	0.50(0.49)	0.98	9817.5	20700.00
12	13914.44	41.35	0.735	0.50(0.49)	0.98	12439.9	50300.00
13	13756.57	44.76	0.707	0.50(0.49)	0.98	14009.2	20600.00
14	13635.23	47.42	0.685	0.50(0.49)	0.98	15215.8	10100.00
15	13532.07	49.44	0.669	0.50(0.49)	0.98	16107.4	30510.00
16	13397.21	51.31	0.656	0.50(0.49)	0.98	16912.5	20500.00
17	13108.08	55.10	0.632	0.50(0.49)	0.98	18483.8	20400.00
18	13058.38	55.73	0.628	0.50(0.49)	0.98	18739.6	20300.00
19	12827.00	58.63	0.610	0.50(0.49)	0.97	19913.3	30300.00
20	12766.86	59.43	0.606	0.50(0.49)	0.97	20221.1	20200.00
21	12751.96	59.62	0.604	0.50(0.49)	0.97	20297.4	20210.00
22	12542.75	62.46	0.594	0.50(0.49)	0.97	21399.5	20100.00

23	12282.85	66.20	0.581	0.50(0.49)	0.97	22850.9	31400.00
24	12135.25	68.49	0.573	0.50(0.49)	0.97	23680.3	13600.00
25	11686.64	76.36	0.546	0.50(0.48)	0.97	26503.3	11801.00
26	11094.95	87.96	0.506	0.50(0.48)	0.97	30504.8	11500.00
27	10449.06	100.15	0.479	0.50(0.48)	0.97	35173.6	11000.00
28	9754.27	114.87	0.449	0.50(0.49)	0.97	41978.8	13000.00
29	8668.71	132.28	0.424	0.50(0.49)	0.97	49224.7	11130.00
30	8153.47	140.65	0.415	0.50(0.49)	0.97	51920.6	13510.00
31	7942.75	144.23	0.410	0.50(0.49)	0.98	53029.6	11620.00
32	6845.93	160.62	0.391	0.50(0.49)	0.98	57612.0	12400.00
33	6119.41	170.52	0.379	0.50(0.49)	0.98	59559.3	13500.00
34	5980.10	172.46	0.377	0.50(0.49)	0.98	59935.8	12201.00
35	5365.29	182.15	0.367	0.50(0.49)	0.98	61224.9	12111.00
36	4433.70	198.67	0.358	0.50(0.49)	0.98	63151.9	12261.00
37	3961.96	208.50	0.352	0.50(0.49)	0.98	63963.7	10200.00
38	3394.89	224.53	0.344	0.50(0.49)	0.98	65201.0	10300.00
39	3162.32	231.67	0.340	0.50(0.49)	0.98	65552.1	12010.00
40	2678.62	252.99	0.328	0.50(0.49)	0.98	65881.4	12000.00
41	1679.33	324.08	0.290	0.50(0.49)	0.98	66551.6	10100.00

TOTAL AREA(ACRES) = 66551.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 14258.29 Tc(MIN.) = 24.231
EFFECTIVE AREA(ACRES) = 5947.53 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 66551.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 66551.6 TC(MIN.) = 24.23
EFFECTIVE AREA(ACRES) = 5947.53 AREA-AVERAGED Fm(INCH/HR)= 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.981
PEAK FLOW RATE(CFS) = 14258.29

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14250.91	18.83	1.157	0.50(0.49)	0.98	4435.2	21100.00
2	14258.29	24.23	0.994	0.50(0.49)	0.98	5947.5	50800.00
3	14258.21	24.27	0.993	0.50(0.49)	0.98	5958.7	21000.00
4	14253.47	25.54	0.961	0.50(0.49)	0.98	6315.3	50700.00
5	14252.59	25.64	0.959	0.50(0.49)	0.98	6341.5	50600.00
6	14244.44	26.21	0.948	0.50(0.49)	0.98	6504.1	50200.00
7	14220.13	27.58	0.921	0.50(0.49)	0.98	7048.6	20810.00
8	14208.24	28.17	0.910	0.50(0.49)	0.98	7288.9	20900.00
9	14170.12	29.93	0.875	0.50(0.49)	0.98	7992.4	50500.00
10	14131.29	31.82	0.851	0.50(0.49)	0.98	8736.0	20800.00
11	14069.69	34.60	0.815	0.50(0.49)	0.98	9817.5	20700.00
12	13914.44	41.35	0.735	0.50(0.49)	0.98	12439.9	50300.00
13	13756.57	44.76	0.707	0.50(0.49)	0.98	14009.2	20600.00
14	13635.23	47.42	0.685	0.50(0.49)	0.98	15215.8	10100.00
15	13532.07	49.44	0.669	0.50(0.49)	0.98	16107.4	30510.00
16	13397.21	51.31	0.656	0.50(0.49)	0.98	16912.5	20500.00
17	13108.08	55.10	0.632	0.50(0.49)	0.98	18483.8	20400.00
18	13058.38	55.73	0.628	0.50(0.49)	0.98	18739.6	20300.00
19	12827.00	58.63	0.610	0.50(0.49)	0.97	19913.3	30300.00
20	12766.86	59.43	0.606	0.50(0.49)	0.97	20221.1	20200.00
21	12751.96	59.62	0.604	0.50(0.49)	0.97	20297.4	20210.00

22	12542.75	62.46	0.594	0.50(0.49)	0.97	21399.5	20100.00
23	12282.85	66.20	0.581	0.50(0.49)	0.97	22850.9	31400.00
24	12135.25	68.49	0.573	0.50(0.49)	0.97	23680.3	13600.00
25	11686.64	76.36	0.546	0.50(0.48)	0.97	26503.3	11801.00
26	11094.95	87.96	0.506	0.50(0.48)	0.97	30504.8	11500.00
27	10449.06	100.15	0.479	0.50(0.48)	0.97	35173.6	11000.00
28	9754.27	114.87	0.449	0.50(0.49)	0.97	41978.8	13000.00
29	8668.71	132.28	0.424	0.50(0.49)	0.97	49224.7	11130.00
30	8153.47	140.65	0.415	0.50(0.49)	0.97	51920.6	13510.00
31	7942.75	144.23	0.410	0.50(0.49)	0.98	53029.6	11620.00
32	6845.93	160.62	0.391	0.50(0.49)	0.98	57612.0	12400.00
33	6119.41	170.52	0.379	0.50(0.49)	0.98	59559.3	13500.00
34	5980.10	172.46	0.377	0.50(0.49)	0.98	59935.8	12201.00
35	5365.29	182.15	0.367	0.50(0.49)	0.98	61224.9	12111.00
36	4433.70	198.67	0.358	0.50(0.49)	0.98	63151.9	12261.00
37	3961.96	208.50	0.352	0.50(0.49)	0.98	63963.7	10200.00
38	3394.89	224.53	0.344	0.50(0.49)	0.98	65201.0	10300.00
39	3162.32	231.67	0.340	0.50(0.49)	0.98	65552.1	12010.00
40	2678.62	252.99	0.328	0.50(0.49)	0.98	65881.4	12000.00
41	1679.33	324.08	0.290	0.50(0.49)	0.98	66551.6	10100.00

END OF RATIONAL METHOD ANALYSIS

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******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

------------------------------------------------------------------------------
  FILE NAME: S35.DAT
  TIME/DATE OF STUDY: 07:25 07/16/2018
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.184
   2)   10.00;  1.510
   3)   15.00;  1.203
   4)   20.00;  1.023
   5)   25.00;  0.902
   6)   30.00;  0.826
   7)   40.00;  0.693
   8)   50.00;  0.611
   9)   60.00;  0.546
  10)   90.00;  0.439
  11)  120.00;  0.374
  12)  180.00;  0.306
  13)  360.00;  0.211
  14) 1440.00;  0.088
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
******************************************************************************
  FLOW PROCESS FROM NODE  13500.00 TO NODE  13500.50 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   548.43
  ELEVATION DATA: UPSTREAM(FEET) =   1183.47  DOWNSTREAM(FEET) =   1065.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.955
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.390
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        5.11      0.50     1.000     0   11.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.09
  TOTAL AREA(ACRES) =      5.11   PEAK FLOW RATE(CFS) =      4.09

******************************************************************************
  FLOW PROCESS FROM NODE  13500.50 TO NODE  13501.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1065.00  DOWNSTREAM(FEET) =   1033.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =   431.71   CHANNEL SLOPE =  0.0738
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.266
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.87      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.56
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   2.02
  Tc(MIN.) =   13.98
  SUBAREA AREA(ACRES) =     8.87       SUBAREA RUNOFF(CFS) =    6.11
  EFFECTIVE AREA(ACRES) =     13.98     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.0         PEAK FLOW RATE(CFS) =       9.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   3.85
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13501.00 =     980.14 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  13501.00 TO NODE  13502.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1033.15  DOWNSTREAM(FEET) =    990.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.63   CHANNEL SLOPE =  0.0452
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.077
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.82      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.51
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   4.51
  Tc(MIN.) =   18.49
  SUBAREA AREA(ACRES) =    16.82       SUBAREA RUNOFF(CFS) =    8.74
  EFFECTIVE AREA(ACRES) =     30.80     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       30.8         PEAK FLOW RATE(CFS) =      16.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.21   FLOW VELOCITY(FEET/SEC.) =   3.64
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13502.00 =    1928.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13502.00 TO NODE  13503.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.26  DOWNSTREAM(FEET) =    956.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.98   CHANNEL SLOPE =  0.0363
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.959
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.02      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.76
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   4.18
  Tc(MIN.) =   22.66
  SUBAREA AREA(ACRES) =    46.02       SUBAREA RUNOFF(CFS) =   18.98
  EFFECTIVE AREA(ACRES) =     76.82     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.8         PEAK FLOW RATE(CFS) =      31.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.63   FLOW VELOCITY(FEET/SEC.) =   3.98
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13503.00 =    2869.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13503.00 TO NODE  13504.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
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```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    956.06  DOWNSTREAM(FEET) =    889.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2131.31   CHANNEL SLOPE =  0.0312
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.805
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.46      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.97
  AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   8.94
  Tc(MIN.) =   31.60
  SUBAREA AREA(ACRES) =    58.46       SUBAREA RUNOFF(CFS) =   16.02
  EFFECTIVE AREA(ACRES) =    135.28     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      135.3         PEAK FLOW RATE(CFS) =      37.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.78   FLOW VELOCITY(FEET/SEC.) =   3.90
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13504.00 =    5001.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13504.00 TO NODE  13505.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    889.48  DOWNSTREAM(FEET) =    848.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1661.97   CHANNEL SLOPE =  0.0249
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.705
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       49.30      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.69
  AVERAGE FLOW DEPTH(FEET) =   1.94   TRAVEL TIME(MIN.) =   7.51
  Tc(MIN.) =   39.11
  SUBAREA AREA(ACRES) =    49.30       SUBAREA RUNOFF(CFS) =    9.08
  EFFECTIVE AREA(ACRES) =    184.58     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      184.6         PEAK FLOW RATE(CFS) =      37.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.86   FLOW VELOCITY(FEET/SEC.) =   3.58
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.00 =    6663.03 FEET.

****************************************************************************
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```
 FLOW PROCESS FROM NODE  13505.00 TO NODE  13505.50 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    848.10  DOWNSTREAM(FEET) =    811.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1234.61   CHANNEL SLOPE =  0.0300
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.658
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       39.35      0.50     0.811     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.811
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.53
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.95
 AVERAGE FLOW DEPTH(FEET) =   1.87   TRAVEL TIME(MIN.) =   5.21
 Tc(MIN.) =   44.32
 SUBAREA AREA(ACRES) =    39.35       SUBAREA RUNOFF(CFS) =    8.92
 EFFECTIVE AREA(ACRES) =    223.93     AREA-AVERAGED Fm(INCH/HR) =   0.48
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =      223.9         PEAK FLOW RATE(CFS) =      37.08
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.79   FLOW VELOCITY(FEET/SEC.) =   3.86
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.50 =    7897.64 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13505.50 TO NODE  13506.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    811.10  DOWNSTREAM(FEET) =    781.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1415.98   CHANNEL SLOPE =  0.0213
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.604
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       54.33      0.50     0.738     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.738
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.81
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.51
 AVERAGE FLOW DEPTH(FEET) =   2.02   TRAVEL TIME(MIN.) =   6.73
 Tc(MIN.) =   51.05
 SUBAREA AREA(ACRES) =    54.33       SUBAREA RUNOFF(CFS) =   11.49
 EFFECTIVE AREA(ACRES) =    278.26     AREA-AVERAGED Fm(INCH/HR) =   0.46
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.92
 TOTAL AREA(ACRES) =      278.3         PEAK FLOW RATE(CFS) =      37.08
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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```
 DEPTH(FEET) =  1.91   FLOW VELOCITY(FEET/SEC.) =   3.38
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.00 =    9313.62 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13506.00 TO NODE  13506.50 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    781.00  DOWNSTREAM(FEET) =    743.17
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1542.62   CHANNEL SLOPE =  0.0245
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.559
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       61.33      0.50     0.783     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.68
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.68
 AVERAGE FLOW DEPTH(FEET) =   1.94   TRAVEL TIME(MIN.) =   6.98
 Tc(MIN.) =   58.03
 SUBAREA AREA(ACRES) =    61.33       SUBAREA RUNOFF(CFS) =    9.22
 EFFECTIVE AREA(ACRES) =    339.59     AREA-AVERAGED Fm(INCH/HR) =   0.45
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.90
 TOTAL AREA(ACRES) =      339.6         PEAK FLOW RATE(CFS) =      37.08
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.86   FLOW VELOCITY(FEET/SEC.) =   3.58
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.50 =   10856.24 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13506.50 TO NODE  13520.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    743.17  DOWNSTREAM(FEET) =    717.04
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1370.93   CHANNEL SLOPE =  0.0191
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.528
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       39.86      0.50     0.848     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.848
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.94
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.29
 AVERAGE FLOW DEPTH(FEET) =   1.99   TRAVEL TIME(MIN.) =   6.95
 Tc(MIN.) =   64.98
 SUBAREA AREA(ACRES) =    39.86       SUBAREA RUNOFF(CFS) =    3.73
 EFFECTIVE AREA(ACRES) =    379.45     AREA-AVERAGED Fm(INCH/HR) =   0.45
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.89
```

```
  TOTAL AREA(ACRES) =      379.5         PEAK FLOW RATE(CFS) =      37.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.95   FLOW VELOCITY(FEET/SEC.) =   3.25
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   64.98
  RAINFALL INTENSITY(INCH/HR) =   0.53
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     379.45
  TOTAL STREAM AREA(ACRES) =     379.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      37.08

****************************************************************************
  FLOW PROCESS FROM NODE  13510.00 TO NODE  13511.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   903.68
  ELEVATION DATA: UPSTREAM(FEET) =   1216.90  DOWNSTREAM(FEET) =   1022.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.615
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.227
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.50     1.000     0   14.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.35
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =      4.35

****************************************************************************
  FLOW PROCESS FROM NODE  13511.00 TO NODE  13512.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1022.78  DOWNSTREAM(FEET) =    954.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1027.63   CHANNEL SLOPE =  0.0667
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.055
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       25.40      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.80
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   4.51
  Tc(MIN.) =   19.12
  SUBAREA AREA(ACRES) =    25.40       SUBAREA RUNOFF(CFS) =   12.67
  EFFECTIVE AREA(ACRES) =     32.06     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       32.1          PEAK FLOW RATE(CFS) =      16.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =   4.20
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13512.00 =    1931.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13512.00 TO NODE  13513.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    954.27  DOWNSTREAM(FEET) =    872.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.42   CHANNEL SLOPE =  0.0425
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.876
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.23      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.22
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   7.61
  Tc(MIN.) =   26.73
  SUBAREA AREA(ACRES) =    90.23       SUBAREA RUNOFF(CFS) =   30.49
  EFFECTIVE AREA(ACRES) =    122.29     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      122.3          PEAK FLOW RATE(CFS) =      41.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.75   FLOW VELOCITY(FEET/SEC.) =   4.50
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13513.00 =    3857.73 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13513.00 TO NODE  13514.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    872.45  DOWNSTREAM(FEET) =    813.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1895.66   CHANNEL SLOPE =  0.0313
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.774
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      135.65      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.38
  AVERAGE FLOW DEPTH(FEET) =   2.10   TRAVEL TIME(MIN.) =   7.21
  Tc(MIN.) =   33.94
  SUBAREA AREA(ACRES) =   135.65       SUBAREA RUNOFF(CFS) =   33.37
  EFFECTIVE AREA(ACRES) =    257.94     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      257.9         PEAK FLOW RATE(CFS) =      63.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.18   FLOW VELOCITY(FEET/SEC.) =   4.46
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13514.00 =    5753.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13514.00 TO NODE  13515.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    813.12  DOWNSTREAM(FEET) =    773.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.15   CHANNEL SLOPE =  0.0204
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.676
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      109.30      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      72.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.95
  AVERAGE FLOW DEPTH(FEET) =   2.47   TRAVEL TIME(MIN.) =   8.14
  Tc(MIN.) =   42.08
  SUBAREA AREA(ACRES) =   109.30       SUBAREA RUNOFF(CFS) =   17.29
  EFFECTIVE AREA(ACRES) =    367.24     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      367.2         PEAK FLOW RATE(CFS) =      63.46
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.35   FLOW VELOCITY(FEET/SEC.) =   3.82
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13515.00 =    7679.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    773.74  DOWNSTREAM(FEET) =    717.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2279.49   CHANNEL SLOPE =  0.0249
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  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.605
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      231.44      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.26
  AVERAGE FLOW DEPTH(FEET) =   2.41   TRAVEL TIME(MIN.) =   8.91
  Tc(MIN.) =   50.99
  SUBAREA AREA(ACRES) =   231.44       SUBAREA RUNOFF(CFS) =   21.74
  EFFECTIVE AREA(ACRES) =    598.68     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      598.7         PEAK FLOW RATE(CFS) =      63.46
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.27   FLOW VELOCITY(FEET/SEC.) =   4.10
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13520.00 =    9959.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   50.99
  RAINFALL INTENSITY(INCH/HR) =   0.60
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     598.68
  TOTAL STREAM AREA(ACRES) =     598.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      63.46

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       37.08   64.98    0.528  0.50( 0.45) 0.89     379.5   13500.00
      2       63.46   50.99    0.605  0.50( 0.50) 1.00     598.7   13510.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      100.54   50.99    0.605  0.50( 0.48) 0.96     896.4   13510.00
      2       54.12   64.98    0.528  0.50( 0.48) 0.96     978.1   13500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     100.54    Tc(MIN.) =    50.99
  EFFECTIVE AREA(ACRES) =     896.44   AREA-AVERAGED Fm(INCH/HR) =  0.48
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  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =      978.1
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13520.00 TO NODE  13520.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    717.04  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.22   CHANNEL SLOPE =  0.0084
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.553
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.31      0.50     0.965     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.965
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     106.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.22
  AVERAGE FLOW DEPTH(FEET) =   2.90   TRAVEL TIME(MIN.) =   7.97
  Tc(MIN.) =   58.96
  SUBAREA AREA(ACRES) =   193.31       SUBAREA RUNOFF(CFS) =   12.19
  EFFECTIVE AREA(ACRES) =   1089.75     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     1171.4         PEAK FLOW RATE(CFS) =     100.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.84   FLOW VELOCITY(FEET/SEC.) =   4.17
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.50 =   14246.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13520.50 TO NODE  13521.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    661.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1622.36   CHANNEL SLOPE =  0.0235
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.534
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.79      0.50     0.897     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.897
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     105.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.18
  AVERAGE FLOW DEPTH(FEET) =   2.39   TRAVEL TIME(MIN.) =   4.37
  Tc(MIN.) =   63.33
  SUBAREA AREA(ACRES) =   129.79       SUBAREA RUNOFF(CFS) =    9.98
  EFFECTIVE AREA(ACRES) =   1219.54     AREA-AVERAGED Fm(INCH/HR) =   0.48
```



```
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     1301.2         PEAK FLOW RATE(CFS) =     100.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.35   FLOW VELOCITY(FEET/SEC.) =   6.09
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13521.00 =   15868.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13521.00 TO NODE  13522.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    661.95  DOWNSTREAM(FEET) =    632.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2746.01   CHANNEL SLOPE =  0.0108
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.499
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      278.60      0.50     0.905     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.905
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     106.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.64
  AVERAGE FLOW DEPTH(FEET) =   2.77   TRAVEL TIME(MIN.) =   9.87
  Tc(MIN.) =   73.20
  SUBAREA AREA(ACRES) =   278.60       SUBAREA RUNOFF(CFS) =   11.88
  EFFECTIVE AREA(ACRES) =   1498.14     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.95
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     1579.8         PEAK FLOW RATE(CFS) =     100.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.71   FLOW VELOCITY(FEET/SEC.) =   4.58
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13522.00 =   18614.76 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     1579.8  TC(MIN.) =     73.20
  EFFECTIVE AREA(ACRES) =   1498.14  AREA-AVERAGED Fm(INCH/HR)=  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.947
  PEAK FLOW RATE(CFS)   =     100.54

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      100.54   73.20    0.499  0.50( 0.47) 0.95    1498.1   13510.00
      2       54.12   90.88    0.437  0.50( 0.47) 0.94    1579.8   13500.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S36.DAT
  TIME/DATE OF STUDY: 07:25 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.604
   2)   10.00;  1.741
   3)   15.00;  1.296
   4)   20.00;  1.108
   5)   25.00;  0.968
   6)   30.00;  0.871
   7)   40.00;  0.743
   8)   50.00;  0.660
   9)   60.00;  0.599
  10)   90.00;  0.495
  11)  120.00;  0.435
  12)  180.00;  0.364
  13)  360.00;  0.267
  14) 1200.00;  0.116
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13600.00 TO NODE  13600.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   488.61
  ELEVATION DATA: UPSTREAM(FEET) =    872.12  DOWNSTREAM(FEET) =    744.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.995
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.652
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        3.39      0.50     1.000     0   11.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.52
  TOTAL AREA(ACRES) =      3.39   PEAK FLOW RATE(CFS) =      3.52

**************************************************************************
  FLOW PROCESS FROM NODE  13600.50 TO NODE  13601.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    744.80  DOWNSTREAM(FEET) =    707.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =   418.30   CHANNEL SLOPE =  0.0896
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.489
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.45      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.79
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   12.83
  SUBAREA AREA(ACRES) =     7.45       SUBAREA RUNOFF(CFS) =    6.63
  EFFECTIVE AREA(ACRES) =     10.84     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       10.8         PEAK FLOW RATE(CFS) =       9.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13601.00 =     906.91 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13601.00 TO NODE  13602.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    707.32  DOWNSTREAM(FEET) =    657.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   777.60   CHANNEL SLOPE =  0.0646
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.267
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.96      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.41
  AVERAGE FLOW DEPTH(FEET) =   1.24   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   15.77
  SUBAREA AREA(ACRES) =    30.96       SUBAREA RUNOFF(CFS) =   21.37
  EFFECTIVE AREA(ACRES) =     41.80     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.8         PEAK FLOW RATE(CFS) =      28.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =   4.81
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13602.00 =    1684.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13602.00 TO NODE  13603.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.12  DOWNSTREAM(FEET) =    584.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1186.54   CHANNEL SLOPE =  0.0611
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.118
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.36      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.98
  AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   3.97
  Tc(MIN.) =   19.74
  SUBAREA AREA(ACRES) =    23.36       SUBAREA RUNOFF(CFS) =   12.98
  EFFECTIVE AREA(ACRES) =     65.16     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       65.2         PEAK FLOW RATE(CFS) =      36.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.55   FLOW VELOCITY(FEET/SEC.) =   5.00
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13603.00 =    2871.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.58  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   860.98   CHANNEL SLOPE =  0.0461
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.029
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.24      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.64
  AVERAGE FLOW DEPTH(FEET) =   1.72   TRAVEL TIME(MIN.) =   3.09
  Tc(MIN.) =   22.83
  SUBAREA AREA(ACRES) =    21.24       SUBAREA RUNOFF(CFS) =   10.10
  EFFECTIVE AREA(ACRES) =     86.40     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       86.4         PEAK FLOW RATE(CFS) =      41.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.72   FLOW VELOCITY(FEET/SEC.) =   4.63
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S35.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      100.54   73.20  0.50( 0.47) 0.95    1498.1   13510.00
      2       54.12   90.88  0.50( 0.47) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =     1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      100.54   73.20  0.50( 0.47) 0.95    1498.1   13510.00
      2       54.12   90.88  0.50( 0.47) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =     1579.8
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13523.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    632.19  DOWNSTREAM(FEET) =    561.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1151.68   CHANNEL SLOPE =  0.0618
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     100.54
  FLOW VELOCITY(FEET/SEC.) =   8.76   FLOW DEPTH(FEET) =   1.96
  TRAVEL TIME(MIN.) =   2.19   Tc(MIN.) =   75.39
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610201U.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       25.99   15.90  0.50( 0.50) 1.00      37.9   20100.00
    TOTAL AREA(ACRES) =       37.9

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      100.54   75.39    0.546  0.50( 0.47) 0.95    1498.1   13510.00
      2       54.12   93.44    0.488  0.50( 0.47) 0.94    1579.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       25.99   15.90    1.262  0.50( 0.50) 1.00      37.9   20100.00
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  13523.00 =    2767.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      126.53   15.90    1.262  0.50( 0.48) 0.95     353.9   20100.00
      2      102.09   75.39    0.546  0.50( 0.47) 0.95    1536.1   13510.00
      3       54.12   93.44    0.488  0.50( 0.47) 0.95    1617.8   13500.00
```



```
    TOTAL AREA(ACRES) =      1617.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      126.53  Tc(MIN.) =   15.903
  EFFECTIVE AREA(ACRES) =    353.95  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1617.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13524.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    561.00  DOWNSTREAM(FEET) =    556.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   238.34   CHANNEL SLOPE =  0.0210
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     126.53
  FLOW VELOCITY(FEET/SEC.) =   6.21   FLOW DEPTH(FEET) =   2.61
  TRAVEL TIME(MIN.) =   0.64   Tc(MIN.) =   16.54
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      242.50   16.54    1.238  0.50( 0.48) 0.95     353.9   20100.00
      2      102.09   76.07    0.543  0.50( 0.47) 0.95    1536.1   13510.00
      3       54.12   94.24    0.487  0.50( 0.47) 0.95    1617.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     242.50  Tc(MIN.) =   16.54
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =     353.95

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610202U.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       22.54   14.22  0.50( 0.50) 1.00      29.0   20200.00
      2       22.29   14.38  0.50( 0.50) 1.00      29.1   20210.00
    TOTAL AREA(ACRES) =       29.1

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
```

```
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      242.50   16.54    1.238  0.50( 0.48) 0.95     353.9   20100.00
      2      102.09   76.07    0.543  0.50( 0.47) 0.95    1536.1   13510.00
      3       54.12   94.24    0.487  0.50( 0.47) 0.95    1617.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       22.54   14.22    1.365  0.50( 0.50) 1.00      29.0   20200.00
      2       22.29   14.38    1.351  0.50( 0.50) 1.00      29.1   20210.00
  LONGEST FLOWPATH FROM NODE  20210.00 TO NODE  13524.00 =    2247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      265.04   14.22    1.365  0.50( 0.48) 0.96     333.2   20200.00
      2      264.42   14.38    1.351  0.50( 0.48) 0.96     336.8   20210.00
      3      261.83   16.54    1.238  0.50( 0.48) 0.96     383.1   20100.00
      4      103.22   76.07    0.543  0.50( 0.48) 0.95    1565.2   13510.00
      5       54.12   94.24    0.487  0.50( 0.47) 0.95    1646.9   13500.00
    TOTAL AREA(ACRES) =      1646.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      265.04  Tc(MIN.) =   14.219
  EFFECTIVE AREA(ACRES) =    333.18  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1646.9
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13620.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.00  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   672.93   CHANNEL SLOPE =  0.0165
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.264
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.94      0.50     0.884     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.884
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     275.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.88
  AVERAGE FLOW DEPTH(FEET) =   3.65   TRAVEL TIME(MIN.) =   1.63
  Tc(MIN.) =   15.85
  SUBAREA AREA(ACRES) =    27.94       SUBAREA RUNOFF(CFS) =   20.67
  EFFECTIVE AREA(ACRES) =    361.12     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.95
```



```
  TOTAL AREA(ACRES) =     1674.8         PEAK FLOW RATE(CFS) =     265.04
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.60   FLOW VELOCITY(FEET/SEC.) =   6.82
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      265.04   15.85    1.264  0.50( 0.48) 0.95     361.1   20200.00
      2      264.42   16.01    1.258  0.50( 0.48) 0.95     364.7   20210.00
      3      261.83   18.18    1.177  0.50( 0.48) 0.95     411.0   20100.00
      4      103.22   78.15    0.536  0.50( 0.47) 0.95    1593.1   13510.00
      5       54.12   96.68    0.482  0.50( 0.47) 0.95    1674.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     265.04  Tc(MIN.) =   15.85
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =     361.12

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      265.04   15.85    1.264  0.50( 0.48) 0.95     361.1   20200.00
      2      264.42   16.01    1.258  0.50( 0.48) 0.95     364.7   20210.00
      3      261.83   18.18    1.177  0.50( 0.48) 0.95     411.0   20100.00
      4      103.22   78.15    0.536  0.50( 0.47) 0.95    1593.1   13510.00
      5       54.12   96.68    0.482  0.50( 0.47) 0.95    1674.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       41.10   22.83    1.029  0.50( 0.50) 1.00      86.4   13600.00
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      306.14   15.85    1.264  0.50( 0.48) 0.96     421.1   20200.00
      2      305.52   16.01    1.258  0.50( 0.48) 0.96     425.3   20210.00
      3      302.92   18.18    1.177  0.50( 0.48) 0.96     479.8   20100.00
      4      290.61   22.83    1.029  0.50( 0.48) 0.96     589.1   13600.00
      5      106.01   78.15    0.536  0.50( 0.48) 0.95    1679.5   13510.00
      6       54.12   96.68    0.482  0.50( 0.47) 0.95    1761.2   13500.00
    TOTAL AREA(ACRES) =      1761.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      306.14  Tc(MIN.) =   15.848
  EFFECTIVE AREA(ACRES) =    421.09  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1761.2
```

```
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13620.00 TO NODE  13621.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    544.91  DOWNSTREAM(FEET) =    527.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   868.57   CHANNEL SLOPE =  0.0206
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     306.14
  FLOW VELOCITY(FEET/SEC.) =   7.68   FLOW DEPTH(FEET) =   3.64
  TRAVEL TIME(MIN.) =   1.88   Tc(MIN.) =   17.73
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      306.14   17.73    1.193  0.50( 0.48) 0.96     421.1   20200.00
      2      305.52   17.90    1.187  0.50( 0.48) 0.96     425.3   20210.00
      3      302.92   20.07    1.106  0.50( 0.48) 0.96     479.8   20100.00
      4      290.61   24.74    0.975  0.50( 0.48) 0.96     589.1   13600.00
      5      106.01   80.60    0.528  0.50( 0.48) 0.95    1679.5   13510.00
      6       54.12   99.58    0.476  0.50( 0.47) 0.95    1761.2   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     306.14  Tc(MIN.) =   17.73
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =     421.09

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610203U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       19.98   14.84  0.50( 0.50) 1.00      27.4   20300.00
    TOTAL AREA(ACRES) =       27.4

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```



```
      1      306.14   17.73    1.193  0.50( 0.48) 0.96     421.1   20200.00
      2      305.52   17.90    1.187  0.50( 0.48) 0.96     425.3   20210.00
      3      302.92   20.07    1.106  0.50( 0.48) 0.96     479.8   20100.00
      4      290.61   24.74    0.975  0.50( 0.48) 0.96     589.1   13600.00
      5      106.01   80.60    0.528  0.50( 0.48) 0.95    1679.5   13510.00
      6       54.12   99.58    0.476  0.50( 0.47) 0.95    1761.2   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       19.98   14.84    1.310  0.50( 0.50) 1.00      27.4   20300.00
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  13621.00 =    2609.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      318.19   14.84    1.310  0.50( 0.48) 0.96     379.8   20300.00
      2      323.23   17.73    1.193  0.50( 0.48) 0.96     448.5   20200.00
      3      322.46   17.90    1.187  0.50( 0.48) 0.96     452.8   20210.00
      4      317.87   20.07    1.106  0.50( 0.48) 0.96     507.2   20100.00
      5      302.33   24.74    0.975  0.50( 0.48) 0.96     616.6   13600.00
      6      106.68   80.60    0.528  0.50( 0.48) 0.95    1707.0   13510.00
      7       54.12   99.58    0.476  0.50( 0.47) 0.95    1788.6   13500.00
    TOTAL AREA(ACRES) =      1788.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      323.23  Tc(MIN.) =   17.732
  EFFECTIVE AREA(ACRES) =    448.52  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1788.6
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13622.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    527.00  DOWNSTREAM(FEET) =    512.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    56.08   CHANNEL SLOPE =  0.2675
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     323.23
  FLOW VELOCITY(FEET/SEC.) =  20.38   FLOW DEPTH(FEET) =   2.30
  TRAVEL TIME(MIN.) =   0.05   Tc(MIN.) =   17.78
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      318.19   14.88    1.306  0.50( 0.48) 0.96     379.8   20300.00
      2      323.23   17.78    1.192  0.50( 0.48) 0.96     448.5   20200.00
      3      322.46   17.94    1.185  0.50( 0.48) 0.96     452.8   20210.00
      4      317.87   20.11    1.105  0.50( 0.48) 0.96     507.2   20100.00
      5      302.33   24.79    0.974  0.50( 0.48) 0.96     616.6   13600.00
      6      106.68   80.66    0.527  0.50( 0.48) 0.95    1707.0   13510.00
      7       54.12   99.65    0.476  0.50( 0.47) 0.95    1788.6   13500.00
```

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     323.23  Tc(MIN.) =   17.78
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =     448.52

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610204U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       24.72   14.34  0.50( 0.50) 1.00      32.2   20400.00
    TOTAL AREA(ACRES) =       32.2

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      318.19   14.88    1.306  0.50( 0.48) 0.96     379.8   20300.00
      2      323.23   17.78    1.192  0.50( 0.48) 0.96     448.5   20200.00
      3      322.46   17.94    1.185  0.50( 0.48) 0.96     452.8   20210.00
      4      317.87   20.11    1.105  0.50( 0.48) 0.96     507.2   20100.00
      5      302.33   24.79    0.974  0.50( 0.48) 0.96     616.6   13600.00
      6      106.68   80.66    0.527  0.50( 0.48) 0.95    1707.0   13510.00
      7       54.12   99.65    0.476  0.50( 0.47) 0.95    1788.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       24.72   14.34    1.355  0.50( 0.50) 1.00      32.2   20400.00
  LONGEST FLOWPATH FROM NODE  20400.00 TO NODE  13622.00 =    2281.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      342.91   14.34    1.355  0.50( 0.48) 0.96     398.1   20400.00
      2      341.51   14.88    1.306  0.50( 0.48) 0.96     411.9   20300.00
      3      343.23   17.78    1.192  0.50( 0.48) 0.96     480.7   20200.00
      4      342.28   17.94    1.185  0.50( 0.48) 0.96     484.9   20210.00
      5      335.36   20.11    1.105  0.50( 0.48) 0.96     539.4   20100.00
      6      316.04   24.79    0.974  0.50( 0.48) 0.96     648.7   13600.00
      7      107.47   80.66    0.527  0.50( 0.48) 0.95    1739.1   13510.00
      8       54.12   99.65    0.476  0.50( 0.48) 0.95    1820.8   13500.00
```



```
    TOTAL AREA(ACRES) =      1820.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      343.23  Tc(MIN.) =   17.778
  EFFECTIVE AREA(ACRES) =    480.67  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1820.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13640.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    512.00  DOWNSTREAM(FEET) =    489.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.72   CHANNEL SLOPE =  0.0500
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.166
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.88      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     377.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.29
  AVERAGE FLOW DEPTH(FEET) =   3.34   TRAVEL TIME(MIN.) =   0.68
  Tc(MIN.) =   18.46
  SUBAREA AREA(ACRES) =   112.88       SUBAREA RUNOFF(CFS) =   67.64
  EFFECTIVE AREA(ACRES) =    593.55     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     1933.7          PEAK FLOW RATE(CFS) =     363.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.29   FLOW VELOCITY(FEET/SEC.) =  11.19
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      372.01   15.02    1.295  0.50( 0.49) 0.97     510.9   20400.00
      2      372.51   15.56    1.275  0.50( 0.49) 0.97     524.8   20300.00
      3      363.57   18.46    1.166  0.50( 0.49) 0.97     593.6   20200.00
      4      362.83   18.62    1.160  0.50( 0.49) 0.97     597.8   20210.00
      5      352.64   20.80    1.086  0.50( 0.48) 0.97     652.2   20100.00
      6      325.21   25.48    0.959  0.50( 0.48) 0.97     761.6   13600.00
      7      107.47   81.58    0.524  0.50( 0.48) 0.96    1852.0   13510.00
      8       54.12  100.76    0.473  0.50( 0.48) 0.95    1933.7   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     372.51  Tc(MIN.) =   15.56
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =     524.83

****************************************************************************
  FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE = 15.1
----------------------------------------------------------------------------
```

```
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610205U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)     NODE
      1        7.85   11.78  0.50( 0.50) 1.00        8.1   20500.00
    TOTAL AREA(ACRES) =        8.1

********************************************************************************
  FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      372.01   15.02    1.295  0.50( 0.49) 0.97      510.9   20400.00
      2      372.51   15.56    1.275  0.50( 0.49) 0.97      524.8   20300.00
      3      363.57   18.46    1.166  0.50( 0.49) 0.97      593.6   20200.00
      4      362.83   18.62    1.160  0.50( 0.49) 0.97      597.8   20210.00
      5      352.64   20.80    1.086  0.50( 0.48) 0.97      652.2   20100.00
      6      325.21   25.48    0.959  0.50( 0.48) 0.97      761.6   13600.00
      7      107.47   81.58    0.524  0.50( 0.48) 0.96     1852.0   13510.00
      8       54.12  100.76    0.473  0.50( 0.48) 0.95     1933.7   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1        7.85   11.78    1.582  0.50( 0.50) 1.00        8.1   20500.00
  LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  13640.00 =    1025.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      379.86   11.78    1.582  0.50( 0.49) 0.97      408.9   20500.00
      2      377.78   15.02    1.295  0.50( 0.49) 0.97      519.0   20400.00
      3      378.12   15.56    1.275  0.50( 0.49) 0.97      532.9   20300.00
      4      368.40   18.46    1.166  0.50( 0.49) 0.97      601.6   20200.00
      5      367.61   18.62    1.160  0.50( 0.49) 0.97      605.8   20210.00
      6      356.88   20.80    1.086  0.50( 0.49) 0.97      660.3   20100.00
      7      328.54   25.48    0.959  0.50( 0.48) 0.97      769.7   13600.00
      8      107.64   81.58    0.524  0.50( 0.48) 0.96     1860.0   13510.00
      9       54.12  100.76    0.473  0.50( 0.48) 0.95     1941.7   13500.00
    TOTAL AREA(ACRES) =      1941.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      379.86  Tc(MIN.) =   11.782
  EFFECTIVE AREA(ACRES) =    408.93  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1941.7
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13640.00 TO NODE  13641.00 IS CODE =  51
--------------------------------------------------------------------------------
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    489.00  DOWNSTREAM(FEET) =    436.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2992.90   CHANNEL SLOPE =  0.0174
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.179
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                 -      180.31      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     435.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.87
  AVERAGE FLOW DEPTH(FEET) =   4.29   TRAVEL TIME(MIN.) =   6.34
  Tc(MIN.) =   18.12
  SUBAREA AREA(ACRES) =   180.31       SUBAREA RUNOFF(CFS) =  110.12
  EFFECTIVE AREA(ACRES) =    589.24     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =     2122.0          PEAK FLOW RATE(CFS) =     379.86
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.08   FLOW VELOCITY(FEET/SEC.) =   7.61
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13641.00 =   25054.98 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      379.86   18.12    1.179  0.50( 0.49) 0.98      589.2   20500.00
      2      377.78   21.40    1.069  0.50( 0.49) 0.98      699.3   20400.00
      3      378.12   21.94    1.054  0.50( 0.49) 0.98      713.2   20300.00
      4      368.40   24.90    0.971  0.50( 0.49) 0.98      781.9   20200.00
      5      367.61   25.06    0.967  0.50( 0.49) 0.98      786.2   20210.00
      6      356.88   27.30    0.923  0.50( 0.49) 0.98      840.6   20100.00
      7      328.54   32.15    0.843  0.50( 0.49) 0.97      950.0   13600.00
      8      107.64   90.58    0.494  0.50( 0.48) 0.96     2040.4   13510.00
      9       54.12  111.42    0.452  0.50( 0.48) 0.96     2122.0   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     379.86  Tc(MIN.) =   18.12
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =     589.24

********************************************************************************
  FLOW PROCESS FROM NODE  13641.00 TO NODE  13642.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.89  DOWNSTREAM(FEET) =    394.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2814.16   CHANNEL SLOPE =  0.0150
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.988
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
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     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED                -      451.39      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     479.79
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.62
AVERAGE FLOW DEPTH(FEET) =   4.58   TRAVEL TIME(MIN.) =   6.15
Tc(MIN.) =   24.27
SUBAREA AREA(ACRES) =   451.39       SUBAREA RUNOFF(CFS) =  198.34
EFFECTIVE AREA(ACRES) =   1040.63     AREA-AVERAGED Fm(INCH/HR) =   0.49
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
TOTAL AREA(ACRES) =     2573.4         PEAK FLOW RATE(CFS) =     462.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  4.52   FLOW VELOCITY(FEET/SEC.) =   7.54
LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13642.00 =   27869.14 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      462.25   24.27    0.988  0.50( 0.49) 0.99    1040.6   20500.00
    2      438.48   27.60    0.917  0.50( 0.49) 0.99    1150.7   20400.00
    3      432.74   28.16    0.907  0.50( 0.49) 0.99    1164.6   20300.00
    4      402.68   31.18    0.856  0.50( 0.49) 0.99    1233.3   20200.00
    5      401.55   31.36    0.854  0.50( 0.49) 0.99    1237.5   20210.00
    6      385.73   33.65    0.824  0.50( 0.49) 0.98    1292.0   20100.00
    7      338.82   38.66    0.760  0.50( 0.49) 0.98    1401.4   13600.00
    8      107.64   99.51    0.476  0.50( 0.48) 0.97    2491.7   13510.00
    9       54.12  122.02    0.433  0.50( 0.48) 0.96    2573.4   13500.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     462.25  Tc(MIN.) =   24.27
AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1040.63

****************************************************************************
FLOW PROCESS FROM NODE  13642.00 TO NODE  13643.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    394.80  DOWNSTREAM(FEET) =    342.39
CHANNEL LENGTH THRU SUBAREA(FEET) =  2913.57   CHANNEL SLOPE =  0.0180
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.870
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -      434.58      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     534.76
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.38
AVERAGE FLOW DEPTH(FEET) =   4.61   TRAVEL TIME(MIN.) =   5.79
Tc(MIN.) =   30.06
SUBAREA AREA(ACRES) =   434.58       SUBAREA RUNOFF(CFS) =  144.71
EFFECTIVE AREA(ACRES) =   1475.21     AREA-AVERAGED Fm(INCH/HR) =   0.50
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
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TOTAL AREA(ACRES) =     3008.0         PEAK FLOW RATE(CFS) =     496.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  4.48   FLOW VELOCITY(FEET/SEC.) =   8.24
LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13643.00 =   30782.71 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      496.22   30.06    0.870  0.50( 0.50) 0.99    1475.2   20500.00
    2      471.67   33.49    0.826  0.50( 0.50) 0.99    1585.3   20400.00
    3      465.67   34.05    0.819  0.50( 0.50) 0.99    1599.2   20300.00
    4      426.17   37.20    0.779  0.50( 0.49) 0.99    1667.9   20200.00
    5      423.86   37.38    0.777  0.50( 0.49) 0.99    1672.1   20210.00
    6      391.18   39.75    0.746  0.50( 0.49) 0.99    1726.6   20100.00
    7      343.99   44.97    0.702  0.50( 0.49) 0.99    1835.9   13600.00
    8      107.64  108.16    0.459  0.50( 0.49) 0.97    2926.3   13510.00
    9       54.12  132.25    0.420  0.50( 0.49) 0.97    3008.0   13500.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     496.22  Tc(MIN.) =   30.06
AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1475.21

****************************************************************************
FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    342.39  DOWNSTREAM(FEET) =    300.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  1591.23   CHANNEL SLOPE =  0.0266
CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.835
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -      109.24      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     512.67
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.62
AVERAGE FLOW DEPTH(FEET) =   4.21   TRAVEL TIME(MIN.) =   2.76
Tc(MIN.) =   32.82
SUBAREA AREA(ACRES) =   109.24       SUBAREA RUNOFF(CFS) =   32.91
EFFECTIVE AREA(ACRES) =   1584.45     AREA-AVERAGED Fm(INCH/HR) =   0.50
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
TOTAL AREA(ACRES) =     3117.3         PEAK FLOW RATE(CFS) =     496.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  4.16   FLOW VELOCITY(FEET/SEC.) =   9.55
LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      496.22   32.82    0.835  0.50( 0.50) 0.99    1584.4   20500.00
```

```
      2      471.67   36.28    0.791  0.50( 0.50) 0.99    1694.5   20400.00
      3      465.67   36.85    0.783  0.50( 0.50) 0.99    1708.4   20300.00
      4      426.17   40.06    0.742  0.50( 0.50) 0.99    1777.1   20200.00
      5      423.86   40.25    0.741  0.50( 0.50) 0.99    1781.4   20210.00
      6      391.18   42.68    0.721  0.50( 0.49) 0.99    1835.8   20100.00
      7      343.99   48.00    0.677  0.50( 0.49) 0.99    1945.2   13600.00
      8      107.64  112.23    0.451  0.50( 0.49) 0.97    3035.6   13510.00
      9       54.12  137.08    0.415  0.50( 0.49) 0.97    3117.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     496.22  Tc(MIN.) =   32.82
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1584.45

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610206U.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       73.20   26.56  0.50( 0.50) 1.00     186.0   20600.00
    TOTAL AREA(ACRES) =      186.0

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      496.22   32.82    0.835  0.50( 0.50) 0.99    1584.4   20500.00
      2      471.67   36.28    0.791  0.50( 0.50) 0.99    1694.5   20400.00
      3      465.67   36.85    0.783  0.50( 0.50) 0.99    1708.4   20300.00
      4      426.17   40.06    0.742  0.50( 0.50) 0.99    1777.1   20200.00
      5      423.86   40.25    0.741  0.50( 0.50) 0.99    1781.4   20210.00
      6      391.18   42.68    0.721  0.50( 0.49) 0.99    1835.8   20100.00
      7      343.99   48.00    0.677  0.50( 0.49) 0.99    1945.2   13600.00
      8      107.64  112.23    0.451  0.50( 0.49) 0.97    3035.6   13510.00
      9       54.12  137.08    0.415  0.50( 0.49) 0.97    3117.3   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       73.20   26.56    0.938  0.50( 0.50) 1.00     186.0   20600.00
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  13660.00 =    6967.00 FEET.

  ** PEAK FLOW RATE TABLE **
```



```
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      569.42   26.56    0.938  0.50( 0.50) 0.99    1468.4   20600.00
      2      552.22   32.82    0.835  0.50( 0.50) 0.99    1770.5   20500.00
      3      520.26   36.28    0.791  0.50( 0.50) 0.99    1880.5   20400.00
      4      513.05   36.85    0.783  0.50( 0.50) 0.99    1894.4   20300.00
      5      466.70   40.06    0.742  0.50( 0.50) 0.99    1963.2   20200.00
      6      464.14   40.25    0.741  0.50( 0.50) 0.99    1967.4   20210.00
      7      428.08   42.68    0.721  0.50( 0.50) 0.99    2021.9   20100.00
      8      373.50   48.00    0.677  0.50( 0.49) 0.99    2131.2   13600.00
      9      107.64  112.23    0.451  0.50( 0.49) 0.97    3221.6   13510.00
     10       54.12  137.08    0.415  0.50( 0.49) 0.97    3303.3   13500.00
    TOTAL AREA(ACRES) =      3303.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      569.42  Tc(MIN.) =   26.562
  EFFECTIVE AREA(ACRES) =   1468.44  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =     3303.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    300.00  DOWNSTREAM(FEET) =    288.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   933.89   CHANNEL SLOPE =  0.0128
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.898
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.43      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     580.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.55
  AVERAGE FLOW DEPTH(FEET) =   5.06   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =   28.62
  SUBAREA AREA(ACRES) =    61.43       SUBAREA RUNOFF(CFS) =   21.98
  EFFECTIVE AREA(ACRES) =   1529.87     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3364.7         PEAK FLOW RATE(CFS) =     569.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.02   FLOW VELOCITY(FEET/SEC.) =   7.52
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      569.42   28.62    0.898  0.50( 0.50) 0.99    1529.9   20600.00
      2      552.22   34.90    0.808  0.50( 0.50) 0.99    1831.9   20500.00
      3      520.26   38.39    0.764  0.50( 0.50) 0.99    1942.0   20400.00
```

```
      4      513.05   38.97    0.756  0.50( 0.50) 0.99    1955.9   20300.00
      5      466.70   42.23    0.724  0.50( 0.50) 0.99    2024.6   20200.00
      6      464.14   42.42    0.723  0.50( 0.50) 0.99    2028.8   20210.00
      7      428.08   44.90    0.702  0.50( 0.50) 0.99    2083.3   20100.00
      8      373.50   50.29    0.658  0.50( 0.49) 0.99    2192.6   13600.00
      9      107.64  115.37    0.444  0.50( 0.49) 0.98    3283.0   13510.00
     10       54.12  140.82    0.410  0.50( 0.49) 0.97    3364.7   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     569.42  Tc(MIN.) =   28.62
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1529.87

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610207U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1      108.52   18.83  0.50( 0.46) 0.92     174.5   20700.00
    TOTAL AREA(ACRES) =      174.5

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      569.42   28.62    0.898  0.50( 0.50) 0.99    1529.9   20600.00
      2      552.22   34.90    0.808  0.50( 0.50) 0.99    1831.9   20500.00
      3      520.26   38.39    0.764  0.50( 0.50) 0.99    1942.0   20400.00
      4      513.05   38.97    0.756  0.50( 0.50) 0.99    1955.9   20300.00
      5      466.70   42.23    0.724  0.50( 0.50) 0.99    2024.6   20200.00
      6      464.14   42.42    0.723  0.50( 0.50) 0.99    2028.8   20210.00
      7      428.08   44.90    0.702  0.50( 0.50) 0.99    2083.3   20100.00
      8      373.50   50.29    0.658  0.50( 0.49) 0.99    2192.6   13600.00
      9      107.64  115.37    0.444  0.50( 0.49) 0.98    3283.0   13510.00
     10       54.12  140.82    0.410  0.50( 0.49) 0.97    3364.7   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      108.52   18.83    1.152  0.50( 0.46) 0.92     174.5   20700.00
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  13680.00 =    6221.00 FEET.

  ** PEAK FLOW RATE TABLE **
```



```
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      677.94   18.83    1.152  0.50( 0.49) 0.98    1181.1   20700.00
      2      637.96   28.62    0.898  0.50( 0.49) 0.99    1704.4   20600.00
      3      606.70   34.90    0.808  0.50( 0.49) 0.99    2006.4   20500.00
      4      567.70   38.39    0.764  0.50( 0.49) 0.99    2116.5   20400.00
      5      559.32   38.97    0.756  0.50( 0.49) 0.99    2130.4   20300.00
      6      507.99   42.23    0.724  0.50( 0.49) 0.99    2199.1   20200.00
      7      505.18   42.42    0.723  0.50( 0.49) 0.99    2203.3   20210.00
      8      465.89   44.90    0.702  0.50( 0.49) 0.99    2257.8   20100.00
      9      404.37   50.29    0.658  0.50( 0.49) 0.98    2367.1   13600.00
     10      112.98  115.37    0.444  0.50( 0.49) 0.97    3457.5   13510.00
     11       59.06  140.82    0.410  0.50( 0.49) 0.97    3539.2   13500.00
    TOTAL AREA(ACRES) =      3539.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      677.94  Tc(MIN.) =   18.833
  EFFECTIVE AREA(ACRES) =   1181.12  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =     3539.2
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.00  DOWNSTREAM(FEET) =    242.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.77   CHANNEL SLOPE =  0.0161
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.986
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.53      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     702.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.61
  AVERAGE FLOW DEPTH(FEET) =   5.21   TRAVEL TIME(MIN.) =   5.53
  Tc(MIN.) =   24.37
  SUBAREA AREA(ACRES) =   112.53       SUBAREA RUNOFF(CFS) =   49.17
  EFFECTIVE AREA(ACRES) =   1293.65     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3651.8         PEAK FLOW RATE(CFS) =     677.94
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.15   FLOW VELOCITY(FEET/SEC.) =   8.54
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      677.94   24.37    0.986  0.50( 0.49) 0.99    1293.6   20700.00
      2      637.96   34.26    0.816  0.50( 0.49) 0.99    1816.9   20600.00
```

```
      3      606.70   40.61    0.738  0.50( 0.49) 0.99     2118.9   20500.00
      4      567.70   44.21    0.708  0.50( 0.49) 0.99     2229.0   20400.00
      5      559.32   44.80    0.703  0.50( 0.49) 0.99     2242.9   20300.00
      6      507.99   48.21    0.675  0.50( 0.49) 0.99     2311.6   20200.00
      7      505.18   48.40    0.673  0.50( 0.49) 0.99     2315.9   20210.00
      8      465.89   51.00    0.654  0.50( 0.49) 0.99     2370.3   20100.00
      9      404.37   56.62    0.620  0.50( 0.49) 0.98     2479.7   13600.00
     10      112.98  124.11    0.430  0.50( 0.49) 0.97     3570.1   13510.00
     11       59.06  151.12    0.398  0.50( 0.49) 0.97     3651.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     677.94  Tc(MIN.) =   24.37
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1293.65

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610208U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      104.54   17.48  0.50( 0.50) 0.99     164.7   20810.00
      2       94.29   21.65  0.50( 0.50) 0.99     185.8   20800.00
    TOTAL AREA(ACRES) =      185.8

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      677.94   24.37    0.986  0.50( 0.49) 0.99    1293.6   20700.00
      2      637.96   34.26    0.816  0.50( 0.49) 0.99    1816.9   20600.00
      3      606.70   40.61    0.738  0.50( 0.49) 0.99    2118.9   20500.00
      4      567.70   44.21    0.708  0.50( 0.49) 0.99    2229.0   20400.00
      5      559.32   44.80    0.703  0.50( 0.49) 0.99    2242.9   20300.00
      6      507.99   48.21    0.675  0.50( 0.49) 0.99    2311.6   20200.00
      7      505.18   48.40    0.673  0.50( 0.49) 0.99    2315.9   20210.00
      8      465.89   51.00    0.654  0.50( 0.49) 0.99    2370.3   20100.00
      9      404.37   56.62    0.620  0.50( 0.49) 0.98    2479.7   13600.00
     10      112.98  124.11    0.430  0.50( 0.49) 0.97    3570.1   13510.00
     11       59.06  151.12    0.398  0.50( 0.49) 0.97    3651.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```



```
      1      104.54   17.48    1.203  0.50( 0.50) 0.99     164.7   20810.00
      2       94.29   21.65    1.062  0.50( 0.50) 0.99     185.8   20800.00
  LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  13682.00 =    5285.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      782.48   17.48    1.203  0.50( 0.49) 0.99    1092.6   20810.00
      2      772.23   21.65    1.062  0.50( 0.49) 0.99    1335.1   20800.00
      3      759.50   24.37    0.986  0.50( 0.49) 0.99    1479.5   20700.00
      4      691.24   34.26    0.816  0.50( 0.49) 0.99    2002.7   20600.00
      5      646.85   40.61    0.738  0.50( 0.49) 0.99    2304.8   20500.00
      6      602.86   44.21    0.708  0.50( 0.49) 0.99    2414.8   20400.00
      7      593.67   44.80    0.703  0.50( 0.49) 0.99    2428.7   20300.00
      8      537.59   48.21    0.675  0.50( 0.49) 0.99    2497.4   20200.00
      9      534.52   48.40    0.673  0.50( 0.49) 0.99    2501.7   20210.00
     10      492.00   51.00    0.654  0.50( 0.49) 0.99    2556.1   20100.00
     11      424.75   56.62    0.620  0.50( 0.49) 0.99    2665.5   13600.00
     12      113.35  124.11    0.430  0.50( 0.49) 0.97    3755.9   13510.00
     13       59.39  151.12    0.398  0.50( 0.49) 0.97    3837.6   13500.00
    TOTAL AREA(ACRES) =      3837.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      782.48  Tc(MIN.) =   17.478
  EFFECTIVE AREA(ACRES) =   1092.60  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =     3837.6
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    242.00  DOWNSTREAM(FEET) =    230.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   660.20   CHANNEL SLOPE =  0.0182
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     782.48
  FLOW VELOCITY(FEET/SEC.) =   9.27   FLOW DEPTH(FEET) =   5.31
  TRAVEL TIME(MIN.) =   1.19   Tc(MIN.) =   18.67
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      782.48   18.67    1.158  0.50( 0.49) 0.99    1092.6   20810.00
      2      772.23   22.84    1.029  0.50( 0.49) 0.99    1335.1   20800.00
      3      759.50   25.56    0.957  0.50( 0.49) 0.99    1479.5   20700.00
      4      691.24   35.48    0.801  0.50( 0.49) 0.99    2002.7   20600.00
      5      646.85   41.85    0.728  0.50( 0.49) 0.99    2304.8   20500.00
      6      602.86   45.47    0.698  0.50( 0.49) 0.99    2414.8   20400.00
      7      593.67   46.07    0.693  0.50( 0.49) 0.99    2428.7   20300.00
      8      537.59   49.52    0.664  0.50( 0.49) 0.99    2497.4   20200.00
      9      534.52   49.71    0.662  0.50( 0.49) 0.99    2501.7   20210.00
     10      492.00   52.33    0.646  0.50( 0.49) 0.99    2556.1   20100.00
     11      424.75   58.01    0.611  0.50( 0.49) 0.99    2665.5   13600.00
```

```
    12      113.35  126.03    0.428  0.50( 0.49) 0.97    3755.9   13510.00
    13       59.39  153.38    0.395  0.50( 0.49) 0.97    3837.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     782.48  Tc(MIN.) =   18.67
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1092.60

****************************************************************************
  FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610209U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1       43.89   19.26  0.50( 0.50) 1.00       76.8   20900.00
    TOTAL AREA(ACRES) =       76.8

****************************************************************************
  FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      782.48   18.67    1.158  0.50( 0.49) 0.99    1092.6   20810.00
      2      772.23   22.84    1.029  0.50( 0.49) 0.99    1335.1   20800.00
      3      759.50   25.56    0.957  0.50( 0.49) 0.99    1479.5   20700.00
      4      691.24   35.48    0.801  0.50( 0.49) 0.99    2002.7   20600.00
      5      646.85   41.85    0.728  0.50( 0.49) 0.99    2304.8   20500.00
      6      602.86   45.47    0.698  0.50( 0.49) 0.99    2414.8   20400.00
      7      593.67   46.07    0.693  0.50( 0.49) 0.99    2428.7   20300.00
      8      537.59   49.52    0.664  0.50( 0.49) 0.99    2497.4   20200.00
      9      534.52   49.71    0.662  0.50( 0.49) 0.99    2501.7   20210.00
     10      492.00   52.33    0.646  0.50( 0.49) 0.99    2556.1   20100.00
     11      424.75   58.01    0.611  0.50( 0.49) 0.99    2665.5   13600.00
     12      113.35  126.03    0.428  0.50( 0.49) 0.97    3755.9   13510.00
     13       59.39  153.38    0.395  0.50( 0.49) 0.97    3837.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1       43.89   19.26    1.136  0.50( 0.50) 1.00       76.8   20900.00
  LONGEST FLOWPATH FROM NODE  20900.00 TO NODE  13682.50 =    4089.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
```



```
      1      826.37   18.67    1.158  0.50( 0.49) 0.99    1167.0   20810.00
      2      824.92   19.26    1.136  0.50( 0.49) 0.99    1203.7   20900.00
      3      808.70   22.84    1.029  0.50( 0.49) 0.99    1411.9   20800.00
      4      791.04   25.56    0.957  0.50( 0.49) 0.99    1556.2   20700.00
      5      711.99   35.48    0.801  0.50( 0.49) 0.99    2079.5   20600.00
      6      662.55   41.85    0.728  0.50( 0.49) 0.99    2381.5   20500.00
      7      616.48   45.47    0.698  0.50( 0.49) 0.99    2491.6   20400.00
      8      606.95   46.07    0.693  0.50( 0.49) 0.99    2505.5   20300.00
      9      548.90   49.52    0.664  0.50( 0.49) 0.99    2574.2   20200.00
     10      545.72   49.71    0.662  0.50( 0.49) 0.99    2578.4   20210.00
     11      502.05   52.33    0.646  0.50( 0.49) 0.99    2632.9   20100.00
     12      432.41   58.01    0.611  0.50( 0.49) 0.99    2742.2   13600.00
     13      113.35  126.03    0.428  0.50( 0.49) 0.97    3832.6   13510.00
     14       59.39  153.38    0.395  0.50( 0.49) 0.97    3914.3   13500.00
   TOTAL AREA(ACRES) =      3914.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      826.37  Tc(MIN.) =   18.665
  EFFECTIVE AREA(ACRES) =   1167.00  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3914.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13682.50 TO NODE  13683.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    230.00  DOWNSTREAM(FEET) =    208.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1866.20   CHANNEL SLOPE =  0.0115
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.036
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       62.32      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     841.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.95
  AVERAGE FLOW DEPTH(FEET) =   5.94   TRAVEL TIME(MIN.) =   3.91
  Tc(MIN.) =   22.58
  SUBAREA AREA(ACRES) =    62.32       SUBAREA RUNOFF(CFS) =   30.04
  EFFECTIVE AREA(ACRES) =   1229.32     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3976.6         PEAK FLOW RATE(CFS) =     826.37
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.90   FLOW VELOCITY(FEET/SEC.) =   7.91
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13683.00 =   38695.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      826.37   22.58    1.036  0.50( 0.49) 0.99    1229.3   20810.00
```

```
      2      824.92   23.17    1.019  0.50( 0.49) 0.99    1266.0   20900.00
      3      808.70   26.78    0.934  0.50( 0.49) 0.99    1474.2   20800.00
      4      791.04   29.52    0.880  0.50( 0.49) 0.99    1618.5   20700.00
      5      711.99   39.55    0.749  0.50( 0.49) 0.99    2141.8   20600.00
      6      662.55   46.00    0.693  0.50( 0.50) 0.99    2443.8   20500.00
      7      616.48   49.69    0.663  0.50( 0.49) 0.99    2553.9   20400.00
      8      606.95   50.31    0.658  0.50( 0.49) 0.99    2567.8   20300.00
      9      548.90   53.87    0.636  0.50( 0.49) 0.99    2636.5   20200.00
     10      545.72   54.06    0.635  0.50( 0.49) 0.99    2640.8   20210.00
     11      502.05   56.78    0.619  0.50( 0.49) 0.99    2695.2   20100.00
     12      432.41   62.62    0.590  0.50( 0.49) 0.99    2804.6   13600.00
     13      113.35  132.50    0.420  0.50( 0.49) 0.98    3894.9   13510.00
     14       59.39  160.99    0.386  0.50( 0.49) 0.97    3976.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     826.37  Tc(MIN.) =   22.58
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1229.32

****************************************************************************
  FLOW PROCESS FROM NODE  13683.00 TO NODE  13684.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    208.53  DOWNSTREAM(FEET) =    200.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   166.32   CHANNEL SLOPE =  0.0513
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     826.37
  FLOW VELOCITY(FEET/SEC.) =  13.86   FLOW DEPTH(FEET) =   4.46
  TRAVEL TIME(MIN.) =   0.20   Tc(MIN.) =   22.78
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      826.37   22.78    1.030  0.50( 0.49) 0.99    1229.3   20810.00
      2      824.92   23.37    1.014  0.50( 0.49) 0.99    1266.0   20900.00
      3      808.70   26.98    0.930  0.50( 0.49) 0.99    1474.2   20800.00
      4      791.04   29.73    0.876  0.50( 0.49) 0.99    1618.5   20700.00
      5      711.99   39.76    0.746  0.50( 0.49) 0.99    2141.8   20600.00
      6      662.55   46.21    0.691  0.50( 0.50) 0.99    2443.8   20500.00
      7      616.48   49.91    0.661  0.50( 0.49) 0.99    2553.9   20400.00
      8      606.95   50.52    0.657  0.50( 0.49) 0.99    2567.8   20300.00
      9      548.90   54.09    0.635  0.50( 0.49) 0.99    2636.5   20200.00
     10      545.72   54.28    0.634  0.50( 0.49) 0.99    2640.8   20210.00
     11      502.05   57.01    0.617  0.50( 0.49) 0.99    2695.2   20100.00
     12      432.41   62.85    0.589  0.50( 0.49) 0.99    2804.6   13600.00
     13      113.35  132.83    0.420  0.50( 0.49) 0.98    3894.9   13510.00
     14       59.39  161.38    0.386  0.50( 0.49) 0.97    3976.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     826.37  Tc(MIN.) =   22.78
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1229.32

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  12
----------------------------------------------------------------------------
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```
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610210U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc       Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)           (ACRES)     NODE
      1       46.68   19.48  0.50( 0.50) 1.00       82.7   21000.00
    TOTAL AREA(ACRES) =       82.7

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      826.37   22.78    1.030  0.50( 0.49) 0.99    1229.3   20810.00
      2      824.92   23.37    1.014  0.50( 0.49) 0.99    1266.0   20900.00
      3      808.70   26.98    0.930  0.50( 0.49) 0.99    1474.2   20800.00
      4      791.04   29.73    0.876  0.50( 0.49) 0.99    1618.5   20700.00
      5      711.99   39.76    0.746  0.50( 0.49) 0.99    2141.8   20600.00
      6      662.55   46.21    0.691  0.50( 0.50) 0.99    2443.8   20500.00
      7      616.48   49.91    0.661  0.50( 0.49) 0.99    2553.9   20400.00
      8      606.95   50.52    0.657  0.50( 0.49) 0.99    2567.8   20300.00
      9      548.90   54.09    0.635  0.50( 0.49) 0.99    2636.5   20200.00
     10      545.72   54.28    0.634  0.50( 0.49) 0.99    2640.8   20210.00
     11      502.05   57.01    0.617  0.50( 0.49) 0.99    2695.2   20100.00
     12      432.41   62.85    0.589  0.50( 0.49) 0.99    2804.6   13600.00
     13      113.35  132.83    0.420  0.50( 0.49) 0.98    3894.9   13510.00
     14       59.39  161.38    0.386  0.50( 0.49) 0.97    3976.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1       46.68   19.48    1.128  0.50( 0.50) 1.00       82.7   21000.00
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  13684.00 =    4160.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      873.05   19.48    1.128  0.50( 0.49) 0.99    1133.8   21000.00
      2      865.80   22.78    1.030  0.50( 0.49) 0.99    1312.0   20810.00
      3      863.12   23.37    1.014  0.50( 0.49) 0.99    1348.7   20900.00
      4      840.65   26.98    0.930  0.50( 0.49) 0.99    1556.9   20800.00
      5      819.02   29.73    0.876  0.50( 0.49) 0.99    1701.2   20700.00
      6      730.28   39.76    0.746  0.50( 0.49) 0.99    2224.5   20600.00
      7      676.78   46.21    0.691  0.50( 0.50) 0.99    2526.5   20500.00
      8      628.43   49.91    0.661  0.50( 0.49) 0.99    2636.6   20400.00
      9      618.60   50.52    0.657  0.50( 0.49) 0.99    2650.5   20300.00
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```
    10      558.93   54.09    0.635  0.50( 0.49) 0.99    2719.2   20200.00
    11      555.67   54.28    0.634  0.50( 0.49) 0.99    2723.5   20210.00
    12      510.75   57.01    0.617  0.50( 0.49) 0.99    2777.9   20100.00
    13      439.02   62.85    0.589  0.50( 0.49) 0.99    2887.3   13600.00
    14      113.35  132.83    0.420  0.50( 0.49) 0.98    3977.7   13510.00
    15       59.39  161.38    0.386  0.50( 0.49) 0.97    4059.3   13500.00
   TOTAL AREA(ACRES) =      4059.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      873.05  Tc(MIN.) =   19.476
  EFFECTIVE AREA(ACRES) =   1133.81  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =     4059.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13685.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    200.00  DOWNSTREAM(FEET) =    194.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   122.69   CHANNEL SLOPE =  0.0469
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     873.05
  FLOW VELOCITY(FEET/SEC.) =  13.60   FLOW DEPTH(FEET) =   4.63
  TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =   19.63
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13685.00 =   38984.01 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      873.05   19.63    1.122  0.50( 0.49) 0.99    1133.8   21000.00
      2      865.80   22.93    1.026  0.50( 0.49) 0.99    1312.0   20810.00
      3      863.12   23.52    1.009  0.50( 0.49) 0.99    1348.7   20900.00
      4      840.65   27.13    0.927  0.50( 0.49) 0.99    1556.9   20800.00
      5      819.02   29.88    0.873  0.50( 0.49) 0.99    1701.2   20700.00
      6      730.28   39.91    0.744  0.50( 0.49) 0.99    2224.5   20600.00
      7      676.78   46.37    0.690  0.50( 0.50) 0.99    2526.5   20500.00
      8      628.43   50.07    0.660  0.50( 0.49) 0.99    2636.6   20400.00
      9      618.60   50.69    0.656  0.50( 0.49) 0.99    2650.5   20300.00
     10      558.93   54.26    0.634  0.50( 0.49) 0.99    2719.2   20200.00
     11      555.67   54.45    0.633  0.50( 0.49) 0.99    2723.5   20210.00
     12      510.75   57.18    0.616  0.50( 0.49) 0.99    2777.9   20100.00
     13      439.02   63.03    0.588  0.50( 0.49) 0.99    2887.3   13600.00
     14      113.35  133.08    0.420  0.50( 0.49) 0.98    3977.7   13510.00
     15       59.39  161.67    0.386  0.50( 0.49) 0.97    4059.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     873.05  Tc(MIN.) =   19.63
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1133.81

****************************************************************************
  FLOW PROCESS FROM NODE  13685.00 TO NODE  13410.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```



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============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    194.24  DOWNSTREAM(FEET) =    178.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1843.57   CHANNEL SLOPE =  0.0084
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.998
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.39      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     874.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.14
  AVERAGE FLOW DEPTH(FEET) =   6.39   TRAVEL TIME(MIN.) =   4.30
  Tc(MIN.) =   23.93
  SUBAREA AREA(ACRES) =     8.39       SUBAREA RUNOFF(CFS) =    3.76
  EFFECTIVE AREA(ACRES) =   1142.20     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4067.7          PEAK FLOW RATE(CFS) =     873.05
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.39   FLOW VELOCITY(FEET/SEC.) =   7.13
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13410.00 =   40827.58 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      873.05   23.93    0.998  0.50( 0.49) 0.99    1142.2   21000.00
      2      865.80   27.24    0.925  0.50( 0.49) 0.99    1320.4   20810.00
      3      863.12   27.83    0.913  0.50( 0.49) 0.99    1357.1   20900.00
      4      840.65   31.47    0.852  0.50( 0.49) 0.99    1565.3   20800.00
      5      819.02   34.25    0.817  0.50( 0.49) 0.99    1709.6   20700.00
      6      730.28   44.42    0.706  0.50( 0.49) 0.99    2232.9   20600.00
      7      676.78   50.96    0.654  0.50( 0.50) 0.99    2534.9   20500.00
      8      628.43   54.75    0.631  0.50( 0.49) 0.99    2645.0   20400.00
      9      618.60   55.38    0.627  0.50( 0.49) 0.99    2658.9   20300.00
     10      558.93   59.07    0.605  0.50( 0.49) 0.99    2727.6   20200.00
     11      555.67   59.27    0.603  0.50( 0.49) 0.99    2731.8   20210.00
     12      510.75   62.10    0.592  0.50( 0.49) 0.99    2786.3   20100.00
     13      439.02   68.14    0.571  0.50( 0.49) 0.99    2895.7   13600.00
     14      113.35  140.26    0.411  0.50( 0.49) 0.98    3986.0   13510.00
     15       59.39  170.09    0.376  0.50( 0.49) 0.97    4067.7   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     873.05  Tc(MIN.) =   23.93
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1142.20
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     4067.7  TC(MIN.) =     23.93
  EFFECTIVE AREA(ACRES) =   1142.20  AREA-AVERAGED Fm(INCH/HR)=  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.989
  PEAK FLOW RATE(CFS)   =     873.05

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	873.05	23.93	0.998	0.50(0.49)	0.99	1142.2	21000.00
2	865.80	27.24	0.925	0.50(0.49)	0.99	1320.4	20810.00
3	863.12	27.83	0.913	0.50(0.49)	0.99	1357.1	20900.00
4	840.65	31.47	0.852	0.50(0.49)	0.99	1565.3	20800.00
5	819.02	34.25	0.817	0.50(0.49)	0.99	1709.6	20700.00
6	730.28	44.42	0.706	0.50(0.49)	0.99	2232.9	20600.00
7	676.78	50.96	0.654	0.50(0.50)	0.99	2534.9	20500.00
8	628.43	54.75	0.631	0.50(0.49)	0.99	2645.0	20400.00
9	618.60	55.38	0.627	0.50(0.49)	0.99	2658.9	20300.00
10	558.93	59.07	0.605	0.50(0.49)	0.99	2727.6	20200.00
11	555.67	59.27	0.603	0.50(0.49)	0.99	2731.8	20210.00
12	510.75	62.10	0.592	0.50(0.49)	0.99	2786.3	20100.00
13	439.02	68.14	0.571	0.50(0.49)	0.99	2895.7	13600.00
14	113.35	140.26	0.411	0.50(0.49)	0.98	3986.0	13510.00
15	59.39	170.09	0.376	0.50(0.49)	0.97	4067.7	13500.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S37.DAT
  TIME/DATE OF STUDY: 07:25 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.597
   2)   10.00;  1.737
   3)   15.00;  1.294
   4)   20.00;  1.106
   5)   25.00;  0.966
   6)   30.00;  0.870
   7)   40.00;  0.742
   8)   50.00;  0.660
   9)   60.00;  0.598
  10)   90.00;  0.494
  11)  120.00;  0.434
  12)  180.00;  0.363
  13)  360.00;  0.266
  14) 1200.00;  0.116
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S34.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    14258.29   24.23  0.50( 0.49) 0.98    5947.5   50800.00
      2    14069.69   34.60  0.50( 0.49) 0.98    9817.5   20700.00
      3    13914.44   41.35  0.50( 0.49) 0.98   12439.9   50300.00
      4    13108.08   55.10  0.50( 0.49) 0.98   18483.8   20400.00
      5    12542.75   62.46  0.50( 0.49) 0.97   21399.5   20100.00
      6    11686.64   76.36  0.50( 0.48) 0.97   26503.3   11801.00
      7    11094.95   87.96  0.50( 0.48) 0.97   30504.8   11500.00
      8    10449.06  100.15  0.50( 0.48) 0.97   35173.6   11000.00
      9     9754.27  114.87  0.50( 0.49) 0.97   41978.8   13000.00
     10     8668.71  132.28  0.50( 0.49) 0.97   49224.7   11130.00
     11     8153.47  140.65  0.50( 0.49) 0.97   51920.6   13510.00
     12     6845.93  160.62  0.50( 0.49) 0.98   57612.0   12400.00
     13     6119.41  170.52  0.50( 0.49) 0.98   59559.3   13500.00
     14     5365.29  182.15  0.50( 0.49) 0.98   61224.9   12111.00
     15     4433.70  198.67  0.50( 0.49) 0.98   63151.9   12261.00
     16     3961.96  208.50  0.50( 0.49) 0.98   63963.7   10200.00
     17     3394.89  224.53  0.50( 0.49) 0.98   65201.0   10300.00
     18     3162.32  231.67  0.50( 0.49) 0.98   65552.1   12010.00
     19     2678.62  252.99  0.50( 0.49) 0.98   65881.4   12000.00
     20     1679.33  324.08  0.50( 0.49) 0.98   66551.6   10100.00
   TOTAL AREA(ACRES) =    66551.6

**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    14258.29   24.23  0.50( 0.49) 0.98    5947.5   50800.00
      2    14069.69   34.60  0.50( 0.49) 0.98    9817.5   20700.00
      3    13914.44   41.35  0.50( 0.49) 0.98   12439.9   50300.00
      4    13108.08   55.10  0.50( 0.49) 0.98   18483.8   20400.00
      5    12542.75   62.46  0.50( 0.49) 0.97   21399.5   20100.00
      6    11686.64   76.36  0.50( 0.48) 0.97   26503.3   11801.00
      7    11094.95   87.96  0.50( 0.48) 0.97   30504.8   11500.00
      8    10449.06  100.15  0.50( 0.48) 0.97   35173.6   11000.00
      9     9754.27  114.87  0.50( 0.49) 0.97   41978.8   13000.00
     10     8668.71  132.28  0.50( 0.49) 0.97   49224.7   11130.00
     11     8153.47  140.65  0.50( 0.49) 0.97   51920.6   13510.00
     12     6845.93  160.62  0.50( 0.49) 0.98   57612.0   12400.00
     13     6119.41  170.52  0.50( 0.49) 0.98   59559.3   13500.00
     14     5365.29  182.15  0.50( 0.49) 0.98   61224.9   12111.00
     15     4433.70  198.67  0.50( 0.49) 0.98   63151.9   12261.00
     16     3961.96  208.50  0.50( 0.49) 0.98   63963.7   10200.00
     17     3394.89  224.53  0.50( 0.49) 0.98   65201.0   10300.00
     18     3162.32  231.67  0.50( 0.49) 0.98   65552.1   12010.00
```

```
     19     2678.62  252.99  0.50( 0.49) 0.98   65881.4   12000.00
     20     1679.33  324.08  0.50( 0.49) 0.98   66551.6   10100.00
    TOTAL AREA(ACRES) =     66551.6

****************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13701.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    167.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.11   CHANNEL SLOPE =  0.0015
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

  CHANNEL FLOW THRU SUBAREA(CFS) =   14258.29
  FLOW VELOCITY(FEET/SEC.) =  11.88   FLOW DEPTH(FEET) =  20.00
  TRAVEL TIME(MIN.) =   2.38   Tc(MIN.) =   26.61
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14258.29   26.61    0.935  0.50( 0.49) 0.98    5947.5   50800.00
      2    14069.69   37.01    0.780  0.50( 0.49) 0.98    9817.5   20700.00
      3    13914.44   43.79    0.711  0.50( 0.49) 0.98   12439.9   50300.00
      4    13108.08   57.69    0.612  0.50( 0.49) 0.98   18483.8   20400.00
      5    12542.75   65.16    0.580  0.50( 0.49) 0.97   21399.5   20100.00
      6    11686.64   79.27    0.531  0.50( 0.48) 0.97   26503.3   11801.00
      7    11094.95   91.02    0.492  0.50( 0.48) 0.97   30504.8   11500.00
      8    10449.06  103.41    0.467  0.50( 0.48) 0.97   35173.6   11000.00
      9     9754.27  118.24    0.438  0.50( 0.49) 0.97   41978.8   13000.00
     10     8668.71  135.74    0.415  0.50( 0.49) 0.97   49224.7   11130.00
     11     8153.47  144.17    0.405  0.50( 0.49) 0.97   51920.6   13510.00
     12     6845.93  164.29    0.382  0.50( 0.49) 0.98   57612.0   12400.00
     13     6119.41  174.30    0.370  0.50( 0.49) 0.98   59559.3   13500.00
     14     5365.29  186.06    0.360  0.50( 0.49) 0.98   61224.9   12111.00
     15     4433.70  202.76    0.351  0.50( 0.49) 0.98   63151.9   12261.00
     16     3961.96  212.72    0.345  0.50( 0.49) 0.98   63963.7   10200.00
     17     3394.89  228.91    0.337  0.50( 0.49) 0.98   65201.0   10300.00
     18     3162.32  236.13    0.333  0.50( 0.49) 0.98   65552.1   12010.00
     19     2678.62  257.64    0.321  0.50( 0.49) 0.98   65881.4   12000.00
     20     1679.33  329.30    0.283  0.50( 0.49) 0.98   66551.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14258.29  Tc(MIN.) =   26.61
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    5947.53

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
```



```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509102U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       75.42   26.59  0.50( 0.44) 0.87     167.7   10200.00
    TOTAL AREA(ACRES) =      167.7

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14258.29   26.61    0.935  0.50( 0.49) 0.98    5947.5   50800.00
      2    14069.69   37.01    0.780  0.50( 0.49) 0.98    9817.5   20700.00
      3    13914.44   43.79    0.711  0.50( 0.49) 0.98   12439.9   50300.00
      4    13108.08   57.69    0.612  0.50( 0.49) 0.98   18483.8   20400.00
      5    12542.75   65.16    0.580  0.50( 0.49) 0.97   21399.5   20100.00
      6    11686.64   79.27    0.531  0.50( 0.48) 0.97   26503.3   11801.00
      7    11094.95   91.02    0.492  0.50( 0.48) 0.97   30504.8   11500.00
      8    10449.06  103.41    0.467  0.50( 0.48) 0.97   35173.6   11000.00
      9     9754.27  118.24    0.438  0.50( 0.49) 0.97   41978.8   13000.00
     10     8668.71  135.74    0.415  0.50( 0.49) 0.97   49224.7   11130.00
     11     8153.47  144.17    0.405  0.50( 0.49) 0.97   51920.6   13510.00
     12     6845.93  164.29    0.382  0.50( 0.49) 0.98   57612.0   12400.00
     13     6119.41  174.30    0.370  0.50( 0.49) 0.98   59559.3   13500.00
     14     5365.29  186.06    0.360  0.50( 0.49) 0.98   61224.9   12111.00
     15     4433.70  202.76    0.351  0.50( 0.49) 0.98   63151.9   12261.00
     16     3961.96  212.72    0.345  0.50( 0.49) 0.98   63963.7   10200.00
     17     3394.89  228.91    0.337  0.50( 0.49) 0.98   65201.0   10300.00
     18     3162.32  236.13    0.333  0.50( 0.49) 0.98   65552.1   12010.00
     19     2678.62  257.64    0.321  0.50( 0.49) 0.98   65881.4   12000.00
     20     1679.33  329.30    0.283  0.50( 0.49) 0.98   66551.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       75.42   26.59    0.936  0.50( 0.44) 0.87     167.7   10200.00
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  13701.00 =    9099.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14333.71   26.59    0.936  0.50( 0.49) 0.98    6108.8   10200.00
      2    14333.63   26.61    0.935  0.50( 0.49) 0.98    6115.2   50800.00
      3    14121.65   37.01    0.780  0.50( 0.49) 0.98    9985.1   20700.00
      4    13955.93   43.79    0.711  0.50( 0.49) 0.98   12607.6   50300.00
```

5	13134.68	57.69	0.612	0.50(0.49)	0.98	18651.4	20400.00
6	12564.49	65.16	0.580	0.50(0.49)	0.97	21567.2	20100.00
7	11701.00	79.27	0.531	0.50(0.48)	0.97	26670.9	11801.00
8	11104.46	91.02	0.492	0.50(0.48)	0.97	30672.5	11500.00
9	10458.09	103.41	0.467	0.50(0.48)	0.97	35341.3	11000.00
10	9762.73	118.24	0.438	0.50(0.49)	0.97	42146.5	13000.00
11	8676.74	135.74	0.415	0.50(0.49)	0.97	49392.4	11130.00
12	8161.30	144.17	0.405	0.50(0.49)	0.97	52088.3	13510.00
13	6853.31	164.29	0.382	0.50(0.49)	0.98	57779.6	12400.00
14	6126.56	174.30	0.370	0.50(0.49)	0.98	59726.9	13500.00
15	5372.24	186.06	0.360	0.50(0.49)	0.98	61392.6	12111.00
16	4440.48	202.76	0.351	0.50(0.49)	0.98	63319.5	12261.00
17	3968.64	212.72	0.345	0.50(0.49)	0.98	64131.3	10200.00
18	3401.40	228.91	0.337	0.50(0.49)	0.98	65368.7	10300.00
19	3168.75	236.13	0.333	0.50(0.49)	0.98	65719.8	12010.00
20	2684.83	257.64	0.321	0.50(0.49)	0.98	66049.1	12000.00
21	1684.80	329.30	0.283	0.50(0.49)	0.98	66719.3	10100.00

TOTAL AREA(ACRES) = 66719.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 14333.71 Tc(MIN.) = 26.586
EFFECTIVE AREA(ACRES) = 6108.76 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 66719.3
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

****
FLOW PROCESS FROM NODE 13701.00 TO NODE 13720.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 167.50 DOWNSTREAM(FEET) = 165.51
CHANNEL LENGTH THRU SUBAREA(FEET) = 192.72 CHANNEL SLOPE = 0.0103
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 14333.71
FLOW VELOCITY(FEET/SEC.) = 19.24 FLOW DEPTH(FEET) = 15.76
TRAVEL TIME(MIN.) = 0.17 Tc(MIN.) = 26.75
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13720.00 = 126443.80 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14333.71	26.75	0.932	0.50(0.49)	0.98	6108.8	10200.00
2	14333.63	26.78	0.932	0.50(0.49)	0.98	6115.2	50800.00
3	14121.65	37.18	0.778	0.50(0.49)	0.98	9985.1	20700.00
4	13955.93	43.96	0.710	0.50(0.49)	0.98	12607.6	50300.00
5	13134.68	57.86	0.611	0.50(0.49)	0.98	18651.4	20400.00
6	12564.49	65.34	0.579	0.50(0.49)	0.97	21567.2	20100.00
7	11701.00	79.45	0.531	0.50(0.48)	0.97	26670.9	11801.00
8	11104.46	91.20	0.492	0.50(0.48)	0.97	30672.5	11500.00
9	10458.09	103.59	0.467	0.50(0.48)	0.97	35341.3	11000.00
10	9762.73	118.42	0.437	0.50(0.49)	0.97	42146.5	13000.00
11	8676.74	135.93	0.415	0.50(0.49)	0.97	49392.4	11130.00
12	8161.30	144.36	0.405	0.50(0.49)	0.97	52088.3	13510.00
13	6853.31	164.49	0.381	0.50(0.49)	0.98	57779.6	12400.00
14	6126.56	174.50	0.370	0.50(0.49)	0.98	59726.9	13500.00

15	5372.24	186.27	0.360	0.50(0.49)	0.98	61392.6	12111.00
16	4440.48	202.99	0.351	0.50(0.49)	0.98	63319.5	12261.00
17	3968.64	212.95	0.345	0.50(0.49)	0.98	64131.3	10200.00
18	3401.40	229.15	0.337	0.50(0.49)	0.98	65368.7	10300.00
19	3168.75	236.37	0.333	0.50(0.49)	0.98	65719.8	12010.00
20	2684.83	257.89	0.321	0.50(0.49)	0.98	66049.1	12000.00
21	1684.80	329.59	0.282	0.50(0.49)	0.98	66719.3	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 14333.71 Tc(MIN.) = 26.75
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 6108.76

****
FLOW PROCESS FROM NODE 13720.00 TO NODE 13740.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 165.51 DOWNSTREAM(FEET) = 161.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 2042.40 CHANNEL SLOPE = 0.0019
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
CAPACITY(NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
ALLOWABLE DEPTH).
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

CHANNEL FLOW THRU SUBAREA(CFS) = 14333.71
FLOW VELOCITY(FEET/SEC.) = 11.94 FLOW DEPTH(FEET) = 20.00
TRAVEL TIME(MIN.) = 2.85 Tc(MIN.) = 29.60
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14333.71	29.60	0.878	0.50(0.49)	0.98	6108.8	10200.00
2	14333.63	29.63	0.877	0.50(0.49)	0.98	6115.2	50800.00
3	14121.65	40.07	0.741	0.50(0.49)	0.98	9985.1	20700.00
4	13955.93	46.88	0.686	0.50(0.49)	0.98	12607.6	50300.00
5	13134.68	60.97	0.595	0.50(0.49)	0.98	18651.4	20400.00
6	12564.49	68.59	0.568	0.50(0.49)	0.97	21567.2	20100.00
7	11701.00	82.94	0.518	0.50(0.48)	0.97	26670.9	11801.00
8	11104.46	94.75	0.484	0.50(0.48)	0.97	30672.5	11500.00
9	10458.09	107.20	0.460	0.50(0.48)	0.97	35341.3	11000.00
10	9762.73	122.09	0.432	0.50(0.49)	0.97	42146.5	13000.00
11	8676.74	139.71	0.411	0.50(0.49)	0.97	49392.4	11130.00
12	8161.30	148.20	0.401	0.50(0.49)	0.97	52088.3	13510.00
13	6853.31	168.51	0.377	0.50(0.49)	0.98	57779.6	12400.00
14	6126.56	178.63	0.365	0.50(0.49)	0.98	59726.9	13500.00
15	5372.24	190.54	0.357	0.50(0.49)	0.98	61392.6	12111.00
16	4440.48	207.46	0.348	0.50(0.49)	0.98	63319.5	12261.00
17	3968.64	217.55	0.343	0.50(0.49)	0.98	64131.3	10200.00
18	3401.40	233.94	0.334	0.50(0.49)	0.98	65368.7	10300.00
19	3168.75	241.24	0.330	0.50(0.49)	0.98	65719.8	12010.00
20	2684.83	262.96	0.318	0.50(0.49)	0.98	66049.1	12000.00
21	1684.80	335.29	0.279	0.50(0.49)	0.98	66719.3	10100.00

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14333.71  Tc(MIN.) =   29.60
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    6108.76

****************************************************************************
  FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509103U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      193.29   27.04  0.50( 0.47) 0.95     474.8   10300.00
    TOTAL AREA(ACRES) =      474.8

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14333.71   29.60    0.878  0.50( 0.49) 0.98    6108.8   10200.00
      2    14333.63   29.63    0.877  0.50( 0.49) 0.98    6115.2   50800.00
      3    14121.65   40.07    0.741  0.50( 0.49) 0.98    9985.1   20700.00
      4    13955.93   46.88    0.686  0.50( 0.49) 0.98   12607.6   50300.00
      5    13134.68   60.97    0.595  0.50( 0.49) 0.98   18651.4   20400.00
      6    12564.49   68.59    0.568  0.50( 0.49) 0.97   21567.2   20100.00
      7    11701.00   82.94    0.518  0.50( 0.48) 0.97   26670.9   11801.00
      8    11104.46   94.75    0.484  0.50( 0.48) 0.97   30672.5   11500.00
      9    10458.09  107.20    0.460  0.50( 0.48) 0.97   35341.3   11000.00
     10     9762.73  122.09    0.432  0.50( 0.49) 0.97   42146.5   13000.00
     11     8676.74  139.71    0.411  0.50( 0.49) 0.97   49392.4   11130.00
     12     8161.30  148.20    0.401  0.50( 0.49) 0.97   52088.3   13510.00
     13     6853.31  168.51    0.377  0.50( 0.49) 0.98   57779.6   12400.00
     14     6126.56  178.63    0.365  0.50( 0.49) 0.98   59726.9   13500.00
     15     5372.24  190.54    0.357  0.50( 0.49) 0.98   61392.6   12111.00
     16     4440.48  207.46    0.348  0.50( 0.49) 0.98   63319.5   12261.00
     17     3968.64  217.55    0.343  0.50( 0.49) 0.98   64131.3   10200.00
     18     3401.40  233.94    0.334  0.50( 0.49) 0.98   65368.7   10300.00
     19     3168.75  241.24    0.330  0.50( 0.49) 0.98   65719.8   12010.00
     20     2684.83  262.96    0.318  0.50( 0.49) 0.98   66049.1   12000.00
     21     1684.80  335.29    0.279  0.50( 0.49) 0.98   66719.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```



```
      1      193.29   27.04    0.927  0.50( 0.47) 0.95     474.8   10300.00
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  13740.00 =    8072.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14527.00   27.04    0.927  0.50( 0.49) 0.98    6054.9   10300.00
      2    14505.97   29.60    0.878  0.50( 0.49) 0.98    6583.5   10200.00
      3    14505.65   29.63    0.877  0.50( 0.49) 0.98    6590.0   50800.00
      4    14235.66   40.07    0.741  0.50( 0.49) 0.98   10459.9   20700.00
      5    14046.05   46.88    0.686  0.50( 0.49) 0.98   13082.3   50300.00
      6    13185.92   60.97    0.595  0.50( 0.49) 0.97   19126.2   20400.00
      7    12604.43   68.59    0.568  0.50( 0.49) 0.97   22041.9   20100.00
      8    11719.67   82.94    0.518  0.50( 0.48) 0.97   27145.7   11801.00
      9    11114.98   94.75    0.484  0.50( 0.48) 0.97   31147.2   11500.00
     10    10468.07  107.20    0.460  0.50( 0.48) 0.97   35816.1   11000.00
     11     9772.10  122.09    0.432  0.50( 0.49) 0.97   42621.3   13000.00
     12     8685.66  139.71    0.411  0.50( 0.49) 0.97   49867.1   11130.00
     13     8170.00  148.20    0.401  0.50( 0.49) 0.97   52563.0   13510.00
     14     6861.48  168.51    0.377  0.50( 0.49) 0.98   58254.4   12400.00
     15     6134.47  178.63    0.365  0.50( 0.49) 0.98   60201.7   13500.00
     16     5380.00  190.54    0.357  0.50( 0.49) 0.98   61867.3   12111.00
     17     4448.04  207.46    0.348  0.50( 0.49) 0.98   63794.3   12261.00
     18     3976.08  217.55    0.343  0.50( 0.49) 0.98   64606.1   10200.00
     19     3408.65  233.94    0.334  0.50( 0.49) 0.98   65843.4   10300.00
     20     3175.92  241.24    0.330  0.50( 0.49) 0.98   66194.5   12010.00
     21     2691.74  262.96    0.318  0.50( 0.49) 0.98   66523.9   12000.00
     22     1690.86  335.29    0.279  0.50( 0.49) 0.98   67194.1   10100.00
    TOTAL AREA(ACRES) =     67194.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    14527.00  Tc(MIN.) =   27.041
  EFFECTIVE AREA(ACRES) =   6054.90  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =    67194.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13741.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    161.63  DOWNSTREAM(FEET) =    141.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   389.20   CHANNEL SLOPE =  0.0530
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   14527.00
  FLOW VELOCITY(FEET/SEC.) =  35.66   FLOW DEPTH(FEET) =  11.65
  TRAVEL TIME(MIN.) =   0.18   Tc(MIN.) =   27.22
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13741.00 =  128875.40 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14527.00   27.22    0.923  0.50( 0.49) 0.98    6054.9   10300.00
      2    14505.97   29.78    0.874  0.50( 0.49) 0.98    6583.5   10200.00
      3    14505.65   29.81    0.874  0.50( 0.49) 0.98    6590.0   50800.00
```

```
      4    14235.66   40.25    0.740  0.50( 0.49) 0.98   10459.9   20700.00
      5    14046.05   47.07    0.684  0.50( 0.49) 0.98   13082.3   50300.00
      6    13185.92   61.16    0.594  0.50( 0.49) 0.97   19126.2   20400.00
      7    12604.43   68.78    0.568  0.50( 0.49) 0.97   22041.9   20100.00
      8    11719.67   83.13    0.518  0.50( 0.48) 0.97   27145.7   11801.00
      9    11114.98   94.95    0.484  0.50( 0.48) 0.97   31147.2   11500.00
     10    10468.07  107.39    0.459  0.50( 0.48) 0.97   35816.1   11000.00
     11     9772.10  122.29    0.431  0.50( 0.49) 0.97   42621.3   13000.00
     12     8685.66  139.92    0.410  0.50( 0.49) 0.97   49867.1   11130.00
     13     8170.00  148.41    0.400  0.50( 0.49) 0.97   52563.0   13510.00
     14     6861.48  168.73    0.376  0.50( 0.49) 0.98   58254.4   12400.00
     15     6134.47  178.86    0.364  0.50( 0.49) 0.98   60201.7   13500.00
     16     5380.00  190.77    0.357  0.50( 0.49) 0.98   61867.3   12111.00
     17     4448.04  207.71    0.348  0.50( 0.49) 0.98   63794.3   12261.00
     18     3976.08  217.80    0.343  0.50( 0.49) 0.98   64606.1   10200.00
     19     3408.65  234.20    0.334  0.50( 0.49) 0.98   65843.4   10300.00
     20     3175.92  241.51    0.330  0.50( 0.49) 0.98   66194.5   12010.00
     21     2691.74  263.24    0.318  0.50( 0.49) 0.98   66523.9   12000.00
     22     1690.86  335.60    0.279  0.50( 0.49) 0.98   67194.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14527.00  Tc(MIN.) =   27.22
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    6054.90

****************************************************************************
  FLOW PROCESS FROM NODE  13741.00 TO NODE  13802.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    141.00  DOWNSTREAM(FEET) =    135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1533.41   CHANNEL SLOPE =  0.0039
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   14527.00
  FLOW VELOCITY(FEET/SEC.) =  13.42   FLOW DEPTH(FEET) =  18.99
  TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =   29.13
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14527.00   29.13    0.887  0.50( 0.49) 0.98    6054.9   10300.00
      2    14505.97   31.69    0.848  0.50( 0.49) 0.98    6583.5   10200.00
      3    14505.65   31.72    0.848  0.50( 0.49) 0.98    6590.0   50800.00
      4    14235.66   42.17    0.724  0.50( 0.49) 0.98   10459.9   20700.00
      5    14046.05   48.99    0.668  0.50( 0.49) 0.98   13082.3   50300.00
      6    13185.92   63.11    0.587  0.50( 0.49) 0.97   19126.2   20400.00
      7    12604.43   70.75    0.561  0.50( 0.49) 0.97   22041.9   20100.00
      8    11719.67   85.14    0.511  0.50( 0.48) 0.97   27145.7   11801.00
      9    11114.98   96.98    0.480  0.50( 0.48) 0.97   31147.2   11500.00
     10    10468.07  109.46    0.455  0.50( 0.48) 0.97   35816.1   11000.00
     11     9772.10  124.40    0.429  0.50( 0.49) 0.97   42621.3   13000.00
     12     8685.66  142.09    0.408  0.50( 0.49) 0.97   49867.1   11130.00
     13     8170.00  150.61    0.398  0.50( 0.49) 0.97   52563.0   13510.00
     14     6861.48  171.03    0.374  0.50( 0.49) 0.98   58254.4   12400.00
     15     6134.47  181.22    0.362  0.50( 0.49) 0.98   60201.7   13500.00
     16     5380.00  193.21    0.356  0.50( 0.49) 0.98   61867.3   12111.00
```



```
     17     4448.04  210.27    0.347  0.50( 0.49) 0.98   63794.3   12261.00
     18     3976.08  220.43    0.341  0.50( 0.49) 0.98   64606.1   10200.00
     19     3408.65  236.93    0.332  0.50( 0.49) 0.98   65843.4   10300.00
     20     3175.92  244.29    0.328  0.50( 0.49) 0.98   66194.5   12010.00
     21     2691.74  266.14    0.317  0.50( 0.49) 0.98   66523.9   12000.00
     22     1690.86  338.86    0.277  0.50( 0.49) 0.98   67194.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14527.00  Tc(MIN.) =   29.13
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    6054.90

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509104U.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      162.67   37.76  0.50( 0.47) 0.94     599.8   10400.00
    TOTAL AREA(ACRES) =      599.8

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14527.00   29.13    0.887  0.50( 0.49) 0.98    6054.9   10300.00
      2    14505.97   31.69    0.848  0.50( 0.49) 0.98    6583.5   10200.00
      3    14505.65   31.72    0.848  0.50( 0.49) 0.98    6590.0   50800.00
      4    14235.66   42.17    0.724  0.50( 0.49) 0.98   10459.9   20700.00
      5    14046.05   48.99    0.668  0.50( 0.49) 0.98   13082.3   50300.00
      6    13185.92   63.11    0.587  0.50( 0.49) 0.97   19126.2   20400.00
      7    12604.43   70.75    0.561  0.50( 0.49) 0.97   22041.9   20100.00
      8    11719.67   85.14    0.511  0.50( 0.48) 0.97   27145.7   11801.00
      9    11114.98   96.98    0.480  0.50( 0.48) 0.97   31147.2   11500.00
     10    10468.07  109.46    0.455  0.50( 0.48) 0.97   35816.1   11000.00
     11     9772.10  124.40    0.429  0.50( 0.49) 0.97   42621.3   13000.00
     12     8685.66  142.09    0.408  0.50( 0.49) 0.97   49867.1   11130.00
     13     8170.00  150.61    0.398  0.50( 0.49) 0.97   52563.0   13510.00
     14     6861.48  171.03    0.374  0.50( 0.49) 0.98   58254.4   12400.00
     15     6134.47  181.22    0.362  0.50( 0.49) 0.98   60201.7   13500.00
     16     5380.00  193.21    0.356  0.50( 0.49) 0.98   61867.3   12111.00
     17     4448.04  207.71    0.348  0.50( 0.49) 0.98   63794.3   12261.00
     18     3976.08  220.43    0.341  0.50( 0.49) 0.98   64606.1   10200.00
     19     3408.65  236.93    0.332  0.50( 0.49) 0.98   65843.4   10300.00
     20     3175.92  244.29    0.328  0.50( 0.49) 0.98   66194.5   12010.00
```

```
    21     2691.74  266.14    0.317  0.50( 0.49) 0.98   66523.9   12000.00
    22     1690.86  338.86    0.277  0.50( 0.49) 0.98   67194.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      162.67   37.76    0.771  0.50( 0.47) 0.94     599.8   10400.00
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  13802.00 =   12273.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    14689.68   29.13    0.887  0.50( 0.49) 0.97    6517.6   10300.00
      2    14668.65   31.69    0.848  0.50( 0.49) 0.97    7086.9   10200.00
      3    14668.33   31.72    0.848  0.50( 0.49) 0.97    7093.8   50800.00
      4    14512.33   37.76    0.771  0.50( 0.49) 0.97    9425.7   10400.00
      5    14373.22   42.17    0.724  0.50( 0.49) 0.98   11059.7   20700.00
      6    14153.42   48.99    0.668  0.50( 0.49) 0.98   13682.1   50300.00
      7    13249.51   63.11    0.587  0.50( 0.49) 0.97   19726.0   20400.00
      8    12653.72   70.75    0.561  0.50( 0.49) 0.97   22641.7   20100.00
      9    11742.01   85.14    0.511  0.50( 0.48) 0.97   27745.5   11801.00
     10    11130.91   96.98    0.480  0.50( 0.48) 0.97   31747.0   11500.00
     11    10483.17  109.46    0.455  0.50( 0.48) 0.97   36415.8   11000.00
     12     9786.33  124.40    0.429  0.50( 0.49) 0.97   43221.0   13000.00
     13     8699.19  142.09    0.408  0.50( 0.49) 0.97   50466.9   11130.00
     14     8183.20  150.61    0.398  0.50( 0.49) 0.97   53162.8   13510.00
     15     6873.88  171.03    0.374  0.50( 0.49) 0.98   58854.2   12400.00
     16     6146.50  181.22    0.362  0.50( 0.49) 0.98   60801.5   13500.00
     17     5391.81  193.21    0.356  0.50( 0.49) 0.98   62467.1   12111.00
     18     4459.54  210.27    0.347  0.50( 0.49) 0.98   64394.1   12261.00
     19     3987.40  220.43    0.341  0.50( 0.49) 0.98   65205.9   10200.00
     20     3419.68  236.93    0.332  0.50( 0.49) 0.98   66443.2   10300.00
     21     3186.81  244.29    0.328  0.50( 0.49) 0.98   66794.3   12010.00
     22     2702.24  266.14    0.317  0.50( 0.49) 0.98   67123.6   12000.00
     23     1700.06  338.86    0.277  0.50( 0.49) 0.98   67793.9   10100.00
    TOTAL AREA(ACRES) =     67793.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    14689.68  Tc(MIN.) =   29.127
  EFFECTIVE AREA(ACRES) =   6517.59  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67793.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13803.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    135.00  DOWNSTREAM(FEET) =    133.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   207.23   CHANNEL SLOPE =  0.0097
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =   14689.68
  FLOW VELOCITY(FEET/SEC.) =  18.87   FLOW DEPTH(FEET) =  16.11
  TRAVEL TIME(MIN.) =   0.18   Tc(MIN.) =   29.31
```



```
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13803.00 =  130616.03 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    14689.68   29.31    0.883  0.50( 0.49) 0.97    6517.6   10300.00
      2    14668.65   31.87    0.846  0.50( 0.49) 0.97    7086.9   10200.00
      3    14668.33   31.90    0.846  0.50( 0.49) 0.97    7093.8   50800.00
      4    14512.33   37.94    0.768  0.50( 0.49) 0.97    9425.7   10400.00
      5    14373.22   42.35    0.723  0.50( 0.49) 0.98   11059.7   20700.00
      6    14153.42   49.17    0.667  0.50( 0.49) 0.98   13682.1   50300.00
      7    13249.51   63.30    0.587  0.50( 0.49) 0.97   19726.0   20400.00
      8    12653.72   70.94    0.560  0.50( 0.49) 0.97   22641.7   20100.00
      9    11742.01   85.33    0.510  0.50( 0.48) 0.97   27745.5   11801.00
     10    11130.91   97.18    0.480  0.50( 0.48) 0.97   31747.0   11500.00
     11    10483.17  109.66    0.455  0.50( 0.48) 0.97   36415.8   11000.00
     12     9786.33  124.60    0.429  0.50( 0.49) 0.97   43221.0   13000.00
     13     8699.19  142.30    0.408  0.50( 0.49) 0.97   50466.9   11130.00
     14     8183.20  150.82    0.398  0.50( 0.49) 0.97   53162.8   13510.00
     15     6873.88  171.25    0.373  0.50( 0.49) 0.98   58854.2   12400.00
     16     6146.50  181.45    0.362  0.50( 0.49) 0.98   60801.5   13500.00
     17     5391.81  193.45    0.356  0.50( 0.49) 0.98   62467.1   12111.00
     18     4459.54  210.51    0.347  0.50( 0.49) 0.98   64394.1   12261.00
     19     3987.40  220.69    0.341  0.50( 0.49) 0.98   65205.9   10200.00
     20     3419.68  237.20    0.332  0.50( 0.49) 0.98   66443.2   10300.00
     21     3186.81  244.56    0.328  0.50( 0.49) 0.98   66794.3   12010.00
     22     2702.24  266.42    0.316  0.50( 0.49) 0.98   67123.6   12000.00
     23     1700.06  339.18    0.277  0.50( 0.49) 0.98   67793.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14689.68  Tc(MIN.) =   29.31
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =    6517.59

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13803.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    67793.9  TC(MIN.) =     29.31
  EFFECTIVE AREA(ACRES) =   6517.59  AREA-AVERAGED Fm(INCH/HR)=  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.973
  PEAK FLOW RATE(CFS)   =   14689.68

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    14689.68   29.31    0.883  0.50( 0.49) 0.97    6517.6   10300.00
      2    14668.65   31.87    0.846  0.50( 0.49) 0.97    7086.9   10200.00
      3    14668.33   31.90    0.846  0.50( 0.49) 0.97    7093.8   50800.00
      4    14512.33   37.94    0.768  0.50( 0.49) 0.97    9425.7   10400.00
      5    14373.22   42.35    0.723  0.50( 0.49) 0.98   11059.7   20700.00
      6    14153.42   49.17    0.667  0.50( 0.49) 0.98   13682.1   50300.00
      7    13249.51   63.30    0.587  0.50( 0.49) 0.97   19726.0   20400.00
      8    12653.72   70.94    0.560  0.50( 0.49) 0.97   22641.7   20100.00
      9    11742.01   85.33    0.510  0.50( 0.48) 0.97   27745.5   11801.00
     10    11130.91   97.18    0.480  0.50( 0.48) 0.97   31747.0   11500.00
```

11	10483.17	109.66	0.455	0.50(0.48)	0.97	36415.8	11000.00
12	9786.33	124.60	0.429	0.50(0.49)	0.97	43221.0	13000.00
13	8699.19	142.30	0.408	0.50(0.49)	0.97	50466.9	11130.00
14	8183.20	150.82	0.398	0.50(0.49)	0.97	53162.8	13510.00
15	6873.88	171.25	0.373	0.50(0.49)	0.98	58854.2	12400.00
16	6146.50	181.45	0.362	0.50(0.49)	0.98	60801.5	13500.00
17	5391.81	193.45	0.356	0.50(0.49)	0.98	62467.1	12111.00
18	4459.54	210.51	0.347	0.50(0.49)	0.98	64394.1	12261.00
19	3987.40	220.69	0.341	0.50(0.49)	0.98	65205.9	10200.00
20	3419.68	237.20	0.332	0.50(0.49)	0.98	66443.2	10300.00
21	3186.81	244.56	0.328	0.50(0.49)	0.98	66794.3	12010.00
22	2702.24	266.42	0.316	0.50(0.49)	0.98	67123.6	12000.00
23	1700.06	339.18	0.277	0.50(0.49)	0.98	67793.9	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**********************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                           Analysis prepared by:

                         Michael Baker International
                       5 Hutton Centre Drive, Suite 500
                                Santa Ana, CA
                                    92707

--------------------------------------------------------------------------------
  FILE NAME: S38.DAT
  TIME/DATE OF STUDY: 07:25 07/16/2018
================================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
================================================================================
                      --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.589
   2)   10.00;  1.732
   3)   15.00;  1.292
   4)   20.00;  1.105
   5)   25.00;  0.965
   6)   30.00;  0.869
   7)   40.00;  0.741
   8)   50.00;  0.659
   9)   60.00;  0.597
  10)   90.00;  0.493
  11)  120.00;  0.433
  12)  180.00;  0.362
  13)  360.00;  0.265
  14) 1200.00;  0.115
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**********************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 15.1
--------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: S37.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    14689.68   29.31  0.50( 0.49) 0.97    6517.6   10300.00
      2    14512.33   37.94  0.50( 0.49) 0.97    9425.7   10400.00
      3    14153.42   49.17  0.50( 0.49) 0.98   13682.1   50300.00
      4    13249.51   63.30  0.50( 0.49) 0.97   19726.0   20400.00
      5    12653.72   70.94  0.50( 0.49) 0.97   22641.7   20100.00
      6    11742.01   85.33  0.50( 0.48) 0.97   27745.5   11801.00
      7    11130.91   97.18  0.50( 0.48) 0.97   31747.0   11500.00
      8    10483.17  109.66  0.50( 0.48) 0.97   36415.8   11000.00
      9     9786.33  124.60  0.50( 0.49) 0.97   43221.0   13000.00
     10     8699.19  142.30  0.50( 0.49) 0.97   50466.9   11130.00
     11     8183.20  150.82  0.50( 0.49) 0.97   53162.8   13510.00
     12     6873.88  171.25  0.50( 0.49) 0.98   58854.2   12400.00
     13     6146.50  181.45  0.50( 0.49) 0.98   60801.5   13500.00
     14     5391.81  193.45  0.50( 0.49) 0.98   62467.1   12111.00
     15     4459.54  210.51  0.50( 0.49) 0.98   64394.1   12261.00
     16     3987.40  220.69  0.50( 0.49) 0.98   65205.9   10200.00
     17     3419.68  237.20  0.50( 0.49) 0.98   66443.2   10300.00
     18     3186.81  244.56  0.50( 0.49) 0.98   66794.3   12010.00
     19     2702.24  266.42  0.50( 0.49) 0.98   67123.6   12000.00
     20     1700.06  339.18  0.50( 0.49) 0.98   67793.9   10100.00
   TOTAL AREA(ACRES) =    67793.9

**********************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 14.0
--------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
================================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    14689.68   29.31  0.50( 0.49) 0.97    6517.6   10300.00
      2    14512.33   37.94  0.50( 0.49) 0.97    9425.7   10400.00
      3    14153.42   49.17  0.50( 0.49) 0.98   13682.1   50300.00
      4    13249.51   63.30  0.50( 0.49) 0.97   19726.0   20400.00
      5    12653.72   70.94  0.50( 0.49) 0.97   22641.7   20100.00
      6    11742.01   85.33  0.50( 0.48) 0.97   27745.5   11801.00
      7    11130.91   97.18  0.50( 0.48) 0.97   31747.0   11500.00
      8    10483.17  109.66  0.50( 0.48) 0.97   36415.8   11000.00
      9     9786.33  124.60  0.50( 0.49) 0.97   43221.0   13000.00
     10     8699.19  142.30  0.50( 0.49) 0.97   50466.9   11130.00
     11     8183.20  150.82  0.50( 0.49) 0.97   53162.8   13510.00
     12     6873.88  171.25  0.50( 0.49) 0.98   58854.2   12400.00
     13     6146.50  181.45  0.50( 0.49) 0.98   60801.5   13500.00
     14     5391.81  193.45  0.50( 0.49) 0.98   62467.1   12111.00
     15     4459.54  210.51  0.50( 0.49) 0.98   64394.1   12261.00
     16     3987.40  220.69  0.50( 0.49) 0.98   65205.9   10200.00
     17     3419.68  237.20  0.50( 0.49) 0.98   66443.2   10300.00
     18     3186.81  244.56  0.50( 0.49) 0.98   66794.3   12010.00
```

```
     19     2702.24  266.42  0.50( 0.49) 0.98   67123.6   12000.00
     20     1700.06  339.18  0.50( 0.49) 0.98   67793.9   10100.00
    TOTAL AREA(ACRES) =     67793.9

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    140.00  DOWNSTREAM(FEET) =    137.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.91   CHANNEL SLOPE =  0.0032
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.862
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.70      0.50     0.983     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.983
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14698.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.53
  AVERAGE FLOW DEPTH(FEET) =  19.77   TRAVEL TIME(MIN.) =   1.23
  Tc(MIN.) =   30.54
  SUBAREA AREA(ACRES) =    53.70       SUBAREA RUNOFF(CFS) =   17.90
  EFFECTIVE AREA(ACRES) =   6571.29     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    67847.6         PEAK FLOW RATE(CFS) =   14689.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 19.76   FLOW VELOCITY(FEET/SEC.) =  12.53
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13820.00 =  131542.94 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14689.68   30.54    0.862  0.50( 0.49) 0.97    6571.3   10300.00
      2    14512.33   39.18    0.752  0.50( 0.49) 0.97    9479.4   10400.00
      3    14153.42   50.42    0.656  0.50( 0.49) 0.98   13735.8   50300.00
      4    13249.51   64.56    0.581  0.50( 0.49) 0.97   19779.7   20400.00
      5    12653.72   72.22    0.555  0.50( 0.49) 0.97   22695.4   20100.00
      6    11742.01   86.64    0.505  0.50( 0.48) 0.97   27799.2   11801.00
      7    11130.91   98.50    0.476  0.50( 0.48) 0.97   31800.7   11500.00
      8    10483.17  111.00    0.451  0.50( 0.48) 0.97   36469.5   11000.00
      9     9786.33  125.96    0.426  0.50( 0.49) 0.97   43274.7   13000.00
     10     8699.19  143.70    0.405  0.50( 0.49) 0.97   50520.6   11130.00
     11     8183.20  152.25    0.395  0.50( 0.49) 0.97   53216.5   13510.00
     12     6873.88  172.74    0.371  0.50( 0.49) 0.98   58907.9   12400.00
     13     6146.50  182.98    0.360  0.50( 0.49) 0.98   60855.2   13500.00
     14     5391.81  195.03    0.354  0.50( 0.49) 0.98   62520.8   12111.00
     15     4459.54  212.17    0.345  0.50( 0.49) 0.98   64447.8   12261.00
     16     3987.40  222.39    0.339  0.50( 0.49) 0.98   65259.6   10200.00
     17     3419.68  238.97    0.330  0.50( 0.49) 0.98   66496.9   10300.00
     18     3186.81  246.37    0.326  0.50( 0.49) 0.98   66848.0   12010.00
     19     2702.24  268.31    0.314  0.50( 0.49) 0.98   67177.4   12000.00
     20     1700.06  341.29    0.275  0.50( 0.49) 0.98   67847.6   10100.00
```



```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14689.68  Tc(MIN.) =   30.54
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =    6571.29

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.54
  RAINFALL INTENSITY(INCH/HR) =   0.86
  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =    6571.29
  TOTAL STREAM AREA(ACRES) =   67847.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   14689.68

****************************************************************************
  FLOW PROCESS FROM NODE  13810.00 TO NODE  13811.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   648.54
  ELEVATION DATA: UPSTREAM(FEET) =    756.46  DOWNSTREAM(FEET) =    586.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.293
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.530
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.58      0.50     1.000     0   12.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.17
  TOTAL AREA(ACRES) =      5.58   PEAK FLOW RATE(CFS) =      5.17

****************************************************************************
  FLOW PROCESS FROM NODE  13811.00 TO NODE  13811.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    586.02  DOWNSTREAM(FEET) =    437.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =   696.28   CHANNEL SLOPE =  0.2130
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.358
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.79      0.50     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.93
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   1.96
  Tc(MIN.) =   14.25
  SUBAREA AREA(ACRES) =    14.79       SUBAREA RUNOFF(CFS) =   11.42
  EFFECTIVE AREA(ACRES) =     20.37     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      15.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   6.51
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13811.50 =    1344.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13811.50 TO NODE  13812.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    437.69  DOWNSTREAM(FEET) =    402.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   681.04   CHANNEL SLOPE =  0.0519
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.217
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.41      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.13
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   2.75
  Tc(MIN.) =   17.00
  SUBAREA AREA(ACRES) =    18.41       SUBAREA RUNOFF(CFS) =   11.88
  EFFECTIVE AREA(ACRES) =     38.78     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.8         PEAK FLOW RATE(CFS) =      25.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.39   FLOW VELOCITY(FEET/SEC.) =   4.30
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13812.00 =    2025.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13812.00 TO NODE  13813.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    402.36  DOWNSTREAM(FEET) =    259.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1282.56   CHANNEL SLOPE =  0.1112
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.091
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.87      0.50     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.12
  AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   3.49
  Tc(MIN.) =   20.49
  SUBAREA AREA(ACRES) =    27.87       SUBAREA RUNOFF(CFS) =   16.61
  EFFECTIVE AREA(ACRES) =     66.65     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =      37.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =   6.27
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13813.00 =    3308.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   259.72  DOWNSTREAM(FEET) =   137.00
  FLOW LENGTH(FEET) =  2412.88   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.98
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      37.24
  PIPE TRAVEL TIME(MIN.) =   2.37    Tc(MIN.) =   22.86
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13820.00 =    5721.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.86
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.025
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.54      0.50     0.570     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.570
  SUBAREA AREA(ACRES) =   82.54      SUBAREA RUNOFF(CFS) =   54.96
  EFFECTIVE AREA(ACRES) =    149.19   AREA-AVERAGED Fm(INCH/HR) =  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =      149.2       PEAK FLOW RATE(CFS) =      88.22

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 22.86
RAINFALL INTENSITY(INCH/HR) = 1.02
AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.74
EFFECTIVE STREAM AREA(ACRES) = 149.19
TOTAL STREAM AREA(ACRES) = 149.19
PEAK FLOW RATE(CFS) AT CONFLUENCE = 88.22

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14689.68	30.54	0.862	0.50(0.49)	0.97	6571.3	10300.00
1	14512.33	39.18	0.752	0.50(0.49)	0.97	9479.4	10400.00
1	14153.42	50.42	0.656	0.50(0.49)	0.98	13735.8	50300.00
1	13249.51	64.56	0.581	0.50(0.49)	0.97	19779.7	20400.00
1	12653.72	72.22	0.555	0.50(0.49)	0.97	22695.4	20100.00
1	11742.01	86.64	0.505	0.50(0.48)	0.97	27799.2	11801.00
1	11130.91	98.50	0.476	0.50(0.48)	0.97	31800.7	11500.00
1	10483.17	111.00	0.451	0.50(0.48)	0.97	36469.5	11000.00
1	9786.33	125.96	0.426	0.50(0.49)	0.97	43274.7	13000.00
1	8699.19	143.70	0.405	0.50(0.49)	0.97	50520.6	11130.00
1	8183.20	152.25	0.395	0.50(0.49)	0.97	53216.5	13510.00
1	6873.88	172.74	0.371	0.50(0.49)	0.98	58907.9	12400.00
1	6146.50	182.98	0.360	0.50(0.49)	0.98	60855.2	13500.00
1	5391.81	195.03	0.354	0.50(0.49)	0.98	62520.8	12111.00
1	4459.54	212.17	0.345	0.50(0.49)	0.98	64447.8	12261.00
1	3987.40	222.39	0.339	0.50(0.49)	0.98	65259.6	10200.00
1	3419.68	238.97	0.330	0.50(0.49)	0.98	66496.9	10300.00
1	3186.81	246.37	0.326	0.50(0.49)	0.98	66848.0	12010.00
1	2702.24	268.31	0.314	0.50(0.49)	0.98	67177.4	12000.00
1	1700.06	341.29	0.275	0.50(0.49)	0.98	67847.6	10100.00
2	88.22	22.86	1.025	0.50(0.37)	0.74	149.2	13810.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14777.90	22.86	1.025	0.50(0.48)	0.97	5067.3	13810.00
2	14756.02	30.54	0.862	0.50(0.48)	0.97	6720.5	10300.00
3	14563.83	39.18	0.752	0.50(0.49)	0.97	9628.6	10400.00
4	14192.15	50.42	0.656	0.50(0.49)	0.97	13885.0	50300.00
5	13278.14	64.56	0.581	0.50(0.49)	0.97	19928.9	20400.00
6	12678.79	72.22	0.555	0.50(0.48)	0.97	22844.6	20100.00
7	11760.37	86.64	0.505	0.50(0.48)	0.97	27948.4	11801.00
8	11147.81	98.50	0.476	0.50(0.48)	0.97	31949.9	11500.00
9	10499.18	111.00	0.451	0.50(0.48)	0.97	36618.7	11000.00
10	9801.45	125.96	0.426	0.50(0.48)	0.97	43423.9	13000.00
11	8713.57	143.70	0.405	0.50(0.49)	0.97	50669.8	11130.00
12	8197.22	152.25	0.395	0.50(0.49)	0.97	53365.7	13510.00
13	6887.04	172.74	0.371	0.50(0.49)	0.97	59057.1	12400.00
14	6159.29	182.98	0.360	0.50(0.49)	0.97	61004.3	13500.00
15	5404.37	195.03	0.354	0.50(0.49)	0.97	62670.0	12111.00
16	4471.78	212.17	0.345	0.50(0.49)	0.98	64597.0	12261.00
17	3999.44	222.39	0.339	0.50(0.49)	0.98	65408.8	10200.00

18	3431.40	238.97	0.330	0.50(0.49)	0.98	66646.1	10300.00
19	3198.39	246.37	0.326	0.50(0.49)	0.98	66997.2	12010.00
20	2713.41	268.31	0.314	0.50(0.49)	0.98	67326.5	12000.00
21	1709.83	341.29	0.275	0.50(0.49)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 14777.90 Tc(MIN.) = 22.86
EFFECTIVE AREA(ACRES) = 5067.25 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 67996.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

****
FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 137.00 DOWNSTREAM(FEET) = 133.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1261.34 CHANNEL SLOPE = 0.0032
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.978
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.60	0.50	0.683	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14786.94
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.46
AVERAGE FLOW DEPTH(FEET) = 19.89 TRAVEL TIME(MIN.) = 1.69
Tc(MIN.) = 24.55
SUBAREA AREA(ACRES) = 31.60 SUBAREA RUNOFF(CFS) = 18.09
EFFECTIVE AREA(ACRES) = 5098.85 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 68028.3 PEAK FLOW RATE(CFS) = 14777.90
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 19.89 FLOW VELOCITY(FEET/SEC.) = 12.46
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14777.90	24.55	0.978	0.50(0.48)	0.96	5098.9	13810.00
2	14756.02	32.23	0.840	0.50(0.48)	0.97	6752.1	10300.00
3	14563.83	40.87	0.734	0.50(0.49)	0.97	9660.2	10400.00
4	14192.15	52.12	0.646	0.50(0.49)	0.97	13916.6	50300.00
5	13278.14	66.30	0.575	0.50(0.49)	0.97	19960.5	20400.00
6	12678.79	73.97	0.549	0.50(0.48)	0.97	22876.2	20100.00
7	11760.37	88.42	0.498	0.50(0.48)	0.97	27980.0	11801.00
8	11147.81	100.31	0.472	0.50(0.48)	0.97	31981.5	11500.00
9	10499.18	112.84	0.447	0.50(0.48)	0.97	36650.3	11000.00
10	9801.45	127.83	0.424	0.50(0.48)	0.97	43455.5	13000.00
11	8713.57	145.63	0.403	0.50(0.49)	0.97	50701.4	11130.00
12	8197.22	154.21	0.393	0.50(0.49)	0.97	53397.3	13510.00

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    13     6887.04  174.78    0.368  0.50( 0.49) 0.97   59088.7   12400.00
    14     6159.29  185.08    0.359  0.50( 0.49) 0.97   61035.9   13500.00
    15     5404.37  197.20    0.353  0.50( 0.49) 0.97   62701.6   12111.00
    16     4471.78  214.45    0.343  0.50( 0.49) 0.97   64628.6   12261.00
    17     3999.44  224.73    0.338  0.50( 0.49) 0.98   65440.4   10200.00
    18     3431.40  241.40    0.329  0.50( 0.49) 0.98   66677.7   10300.00
    19     3198.39  248.84    0.325  0.50( 0.49) 0.98   67028.8   12010.00
    20     2713.41  270.88    0.313  0.50( 0.49) 0.98   67358.1   12000.00
    21     1709.83  344.18    0.274  0.50( 0.49) 0.98   68028.3   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14777.90  Tc(MIN.) =   24.55
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    5098.85

****************************************************************************
  FLOW PROCESS FROM NODE  13820.00 TO NODE  13840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.55
  RAINFALL INTENSITY(INCH/HR) =   0.98
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.96
  EFFECTIVE STREAM AREA(ACRES) =    5098.85
  TOTAL STREAM AREA(ACRES) =   68028.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   14777.90

****************************************************************************
  FLOW PROCESS FROM NODE  13830.00 TO NODE  13831.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   744.71
  ELEVATION DATA: UPSTREAM(FEET) =   1100.95  DOWNSTREAM(FEET) =    959.21

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.858
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.393
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.06      0.50     1.000     0   13.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.06
  TOTAL AREA(ACRES) =      5.06   PEAK FLOW RATE(CFS) =      4.06

****************************************************************************
  FLOW PROCESS FROM NODE  13831.00 TO NODE  13832.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    959.21  DOWNSTREAM(FEET) =    832.83
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1076.71   CHANNEL SLOPE =  0.1174
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.202
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.57      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.07
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   3.54
  Tc(MIN.) =   17.39
  SUBAREA AREA(ACRES) =    32.57       SUBAREA RUNOFF(CFS) =   20.58
  EFFECTIVE AREA(ACRES) =     37.63     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =      23.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   5.77
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13832.00 =    1821.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13832.00 TO NODE  13833.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    832.83  DOWNSTREAM(FEET) =    572.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.58   CHANNEL SLOPE =  0.1382
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.044
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.23      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.56
  AVERAGE FLOW DEPTH(FEET) =   1.27   TRAVEL TIME(MIN.) =   4.79
  Tc(MIN.) =   22.18
  SUBAREA AREA(ACRES) =    32.23       SUBAREA RUNOFF(CFS) =   15.77
  EFFECTIVE AREA(ACRES) =     69.86     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.9         PEAK FLOW RATE(CFS) =      34.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   6.67
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13833.00 =    3705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13833.00 TO NODE  13834.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    572.49  DOWNSTREAM(FEET) =    471.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.78   CHANNEL SLOPE =  0.1068
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.974
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.51      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.31
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   24.67
  SUBAREA AREA(ACRES) =    27.51       SUBAREA RUNOFF(CFS) =   11.73
  EFFECTIVE AREA(ACRES) =     97.37     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.4          PEAK FLOW RATE(CFS) =      41.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   6.36
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13834.00 =    4648.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13834.00 TO NODE  13835.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    471.65  DOWNSTREAM(FEET) =    347.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1647.45   CHANNEL SLOPE =  0.0756
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.885
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.21      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.09
  AVERAGE FLOW DEPTH(FEET) =   1.78   TRAVEL TIME(MIN.) =   4.51
  Tc(MIN.) =   29.18
  SUBAREA AREA(ACRES) =    94.21       SUBAREA RUNOFF(CFS) =   32.60
  EFFECTIVE AREA(ACRES) =    191.58     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      191.6          PEAK FLOW RATE(CFS) =      66.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.87   FLOW VELOCITY(FEET/SEC.) =   6.29
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13835.00 =    6296.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13835.00 TO NODE  13836.00 IS CODE =  51
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    347.06  DOWNSTREAM(FEET) =    269.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1696.71   CHANNEL SLOPE =  0.0458
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.817
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      233.25      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      99.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.77
  AVERAGE FLOW DEPTH(FEET) =   2.40   TRAVEL TIME(MIN.) =   4.90
  Tc(MIN.) =   34.08
  SUBAREA AREA(ACRES) =   233.25       SUBAREA RUNOFF(CFS) =   66.45
  EFFECTIVE AREA(ACRES) =    424.83     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      424.8          PEAK FLOW RATE(CFS) =     121.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.58   FLOW VELOCITY(FEET/SEC.) =   6.05
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13836.00 =    7992.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13836.00 TO NODE  13837.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    269.29  DOWNSTREAM(FEET) =    191.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2529.21   CHANNEL SLOPE =  0.0306
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.725
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.70      0.50     0.880     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     138.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.39
  AVERAGE FLOW DEPTH(FEET) =   2.92   TRAVEL TIME(MIN.) =   7.82
  Tc(MIN.) =   41.90
  SUBAREA AREA(ACRES) =   134.70       SUBAREA RUNOFF(CFS) =   34.58
  EFFECTIVE AREA(ACRES) =    559.53     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      559.5          PEAK FLOW RATE(CFS) =     121.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.78   FLOW VELOCITY(FEET/SEC.) =   5.21
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13837.00 =   10522.15 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   191.87  DOWNSTREAM(FEET) =   133.00
  FLOW LENGTH(FEET) =  1151.02   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.71
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     121.03
  PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =   42.75
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13840.00 =   11673.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   42.75
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.718
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.97      0.50      0.622     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.622
  SUBAREA AREA(ACRES) =    5.97      SUBAREA RUNOFF(CFS) =    2.19
  EFFECTIVE AREA(ACRES) =    565.50   AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =      565.5       PEAK FLOW RATE(CFS) =     121.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   42.75
  RAINFALL INTENSITY(INCH/HR) =   0.72
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     565.50
  TOTAL STREAM AREA(ACRES) =     565.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     121.03

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14777.90   24.55    0.978  0.50( 0.48) 0.96    5098.9   13810.00
      1    14756.02   32.23    0.840  0.50( 0.48) 0.97    6752.1   10300.00
      1    14563.83   40.87    0.734  0.50( 0.49) 0.97    9660.2   10400.00
```



```
      1    14192.15   52.12    0.646  0.50( 0.49) 0.97   13916.6   50300.00
      1    13278.14   66.30    0.575  0.50( 0.49) 0.97   19960.5   20400.00
      1    12678.79   73.97    0.549  0.50( 0.48) 0.97   22876.2   20100.00
      1    11760.37   88.42    0.498  0.50( 0.48) 0.97   27980.0   11801.00
      1    11147.81  100.31    0.472  0.50( 0.48) 0.97   31981.5   11500.00
      1    10499.18  112.84    0.447  0.50( 0.48) 0.97   36650.3   11000.00
      1     9801.45  127.83    0.424  0.50( 0.48) 0.97   43455.5   13000.00
      1     8713.57  145.63    0.403  0.50( 0.49) 0.97   50701.4   11130.00
      1     8197.22  154.21    0.393  0.50( 0.49) 0.97   53397.3   13510.00
      1     6887.04  174.78    0.368  0.50( 0.49) 0.97   59088.7   12400.00
      1     6159.29  185.08    0.359  0.50( 0.49) 0.97   61035.9   13500.00
      1     5404.37  197.20    0.353  0.50( 0.49) 0.97   62701.6   12111.00
      1     4471.78  214.45    0.343  0.50( 0.49) 0.97   64628.6   12261.00
      1     3999.44  224.73    0.338  0.50( 0.49) 0.98   65440.4   10200.00
      1     3431.40  241.40    0.329  0.50( 0.49) 0.98   66677.7   10300.00
      1     3198.39  248.84    0.325  0.50( 0.49) 0.98   67028.8   12010.00
      1     2713.41  270.88    0.313  0.50( 0.49) 0.98   67358.1   12000.00
      1     1709.83  344.18    0.274  0.50( 0.49) 0.98   68028.3   10100.00
      2      121.03   42.75    0.718  0.50( 0.48) 0.97     565.5   13830.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14898.93   24.55    0.978  0.50( 0.48) 0.96    5423.6   13810.00
      2    14877.06   32.23    0.840  0.50( 0.48) 0.97    7178.5   10300.00
      3    14684.87   40.87    0.734  0.50( 0.49) 0.97   10200.9   10400.00
      4    14622.87   42.75    0.718  0.50( 0.49) 0.97   10935.7   13830.00
      5    14275.71   52.12    0.646  0.50( 0.49) 0.97   14482.1   50300.00
      6    13325.23   66.30    0.575  0.50( 0.49) 0.97   20526.0   20400.00
      7    12712.15   73.97    0.549  0.50( 0.48) 0.97   23441.7   20100.00
      8    11768.75   88.42    0.498  0.50( 0.48) 0.97   28545.5   11801.00
      9    11155.75  100.31    0.472  0.50( 0.48) 0.97   32547.0   11500.00
     10    10506.70  112.84    0.447  0.50( 0.48) 0.97   37215.8   11000.00
     11     9808.57  127.83    0.424  0.50( 0.48) 0.97   44021.0   13000.00
     12     8720.33  145.63    0.403  0.50( 0.49) 0.97   51266.9   11130.00
     13     8203.82  154.21    0.393  0.50( 0.49) 0.97   53962.8   13510.00
     14     6893.23  174.78    0.368  0.50( 0.49) 0.97   59654.2   12400.00
     15     6165.33  185.08    0.359  0.50( 0.49) 0.97   61601.4   13500.00
     16     5410.30  197.20    0.353  0.50( 0.49) 0.97   63267.1   12111.00
     17     4477.55  214.45    0.343  0.50( 0.49) 0.97   65194.1   12261.00
     18     4005.12  224.73    0.338  0.50( 0.49) 0.98   66005.9   10200.00
     19     3436.93  241.40    0.329  0.50( 0.49) 0.98   67243.2   10300.00
     20     3203.85  248.84    0.325  0.50( 0.49) 0.98   67594.3   12010.00
     21     2718.67  270.88    0.313  0.50( 0.49) 0.98   67923.6   12000.00
     22     1714.43  344.18    0.274  0.50( 0.49) 0.98   68593.8   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   14898.93    Tc(MIN.) =    24.55
  EFFECTIVE AREA(ACRES) =    5423.57   AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =    68593.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13840.00 =  132804.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13840.00 TO NODE  13860.00 IS CODE =  51
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    133.00  DOWNSTREAM(FEET) =    130.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.44   CHANNEL SLOPE =  0.0046
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.959
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.61      0.50     0.975     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.975
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14900.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.33
  AVERAGE FLOW DEPTH(FEET) =  18.62   TRAVEL TIME(MIN.) =   0.76
  Tc(MIN.) =   25.31
  SUBAREA AREA(ACRES) =     6.61       SUBAREA RUNOFF(CFS) =    2.80
  EFFECTIVE AREA(ACRES) =   5430.18     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =    68600.5         PEAK FLOW RATE(CFS) =   14898.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 18.62   FLOW VELOCITY(FEET/SEC.) =  14.33
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13860.00 =  133458.72 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14898.93   25.31    0.959  0.50( 0.48) 0.96    5430.2   13810.00
      2    14877.06   32.99    0.831  0.50( 0.48) 0.97    7185.1   10300.00
      3    14684.87   41.63    0.728  0.50( 0.49) 0.97   10207.5   10400.00
      4    14622.87   43.51    0.712  0.50( 0.49) 0.97   10942.3   13830.00
      5    14275.71   52.89    0.641  0.50( 0.49) 0.97   14488.7   50300.00
      6    13325.23   67.08    0.572  0.50( 0.49) 0.97   20532.6   20400.00
      7    12712.15   74.77    0.546  0.50( 0.48) 0.97   23448.3   20100.00
      8    11768.75   89.23    0.496  0.50( 0.48) 0.97   28552.1   11801.00
      9    11155.75  101.13    0.471  0.50( 0.48) 0.97   32553.6   11500.00
     10    10506.70  113.67    0.446  0.50( 0.48) 0.97   37222.4   11000.00
     11     9808.57  128.68    0.423  0.50( 0.48) 0.97   44027.6   13000.00
     12     8720.33  146.50    0.402  0.50( 0.49) 0.97   51273.5   11130.00
     13     8203.82  155.09    0.391  0.50( 0.49) 0.97   53969.4   13510.00
     14     6893.23  175.70    0.367  0.50( 0.49) 0.97   59660.8   12400.00
     15     6165.33  186.03    0.359  0.50( 0.49) 0.97   61608.1   13500.00
     16     5410.30  198.18    0.352  0.50( 0.49) 0.97   63273.7   12111.00
     17     4477.55  215.48    0.343  0.50( 0.49) 0.97   65200.7   12261.00
     18     4005.12  225.79    0.337  0.50( 0.49) 0.98   66012.5   10200.00
     19     3436.93  242.50    0.328  0.50( 0.49) 0.98   67249.8   10300.00
     20     3203.85  249.96    0.324  0.50( 0.49) 0.98   67600.9   12010.00
     21     2718.67  272.05    0.312  0.50( 0.49) 0.98   67930.2   12000.00
     22     1714.43  345.49    0.273  0.50( 0.49) 0.98   68600.5   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   14898.93  Tc(MIN.) =   25.31
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    5430.18
```



```
******************************************************************************
  FLOW PROCESS FROM NODE  13840.00 TO NODE  13860.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.31
  RAINFALL INTENSITY(INCH/HR) =   0.96
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.96
  EFFECTIVE STREAM AREA(ACRES) =    5430.18
  TOTAL STREAM AREA(ACRES) =   68600.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   14898.93

******************************************************************************
  FLOW PROCESS FROM NODE  13850.00 TO NODE  13851.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   617.57
  ELEVATION DATA: UPSTREAM(FEET) =    646.95  DOWNSTREAM(FEET) =    490.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.137
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.544
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        4.95      0.50     1.000     0   12.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.65
  TOTAL AREA(ACRES) =      4.95   PEAK FLOW RATE(CFS) =      4.65

******************************************************************************
  FLOW PROCESS FROM NODE  13851.00 TO NODE  13851.50 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.10  DOWNSTREAM(FEET) =    440.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   351.14   CHANNEL SLOPE =  0.1399
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.427
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.02      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.41
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   1.33
  Tc(MIN.) =   13.46
  SUBAREA AREA(ACRES) =     4.02       SUBAREA RUNOFF(CFS) =    3.35
  EFFECTIVE AREA(ACRES) =      8.97     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.0          PEAK FLOW RATE(CFS) =       7.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   4.59
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13851.50 =     968.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13851.50 TO NODE  13852.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    440.98  DOWNSTREAM(FEET) =    395.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.91   CHANNEL SLOPE =  0.0882
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.272
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.17      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.15
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =   15.52
  SUBAREA AREA(ACRES) =     7.17       SUBAREA RUNOFF(CFS) =    4.98
  EFFECTIVE AREA(ACRES) =     16.14     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       16.1          PEAK FLOW RATE(CFS) =      11.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.94   FLOW VELOCITY(FEET/SEC.) =   4.27
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13852.00 =    1481.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13852.00 TO NODE  13853.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    395.76  DOWNSTREAM(FEET) =    354.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   443.69   CHANNEL SLOPE =  0.0920
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.212
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.76      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.56
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =   1.62
  Tc(MIN.) =   17.15
  SUBAREA AREA(ACRES) =     6.76       SUBAREA RUNOFF(CFS) =    4.33
  EFFECTIVE AREA(ACRES) =     22.90     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.9          PEAK FLOW RATE(CFS) =      14.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   4.65
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13853.00 =    1925.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13853.00 TO NODE  13854.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    354.94  DOWNSTREAM(FEET) =    263.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.09   CHANNEL SLOPE =  0.0950
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.096
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.16      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.07
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   3.16
  Tc(MIN.) =   20.31
  SUBAREA AREA(ACRES) =    18.16       SUBAREA RUNOFF(CFS) =    9.74
  EFFECTIVE AREA(ACRES) =     41.06     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.1          PEAK FLOW RATE(CFS) =      22.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   5.21
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13854.00 =    2887.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13854.00 TO NODE  13855.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    263.57  DOWNSTREAM(FEET) =    188.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1228.77   CHANNEL SLOPE =  0.0609
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.977
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.75      0.50      0.879     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.879
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.81
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =   4.26
  Tc(MIN.) =   24.57
  SUBAREA AREA(ACRES) =    38.75       SUBAREA RUNOFF(CFS) =   18.74
  EFFECTIVE AREA(ACRES) =     79.81     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       79.8         PEAK FLOW RATE(CFS) =      36.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.56   FLOW VELOCITY(FEET/SEC.) =   4.99
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13855.00 =    4116.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   188.74  DOWNSTREAM(FEET) =   130.00
  FLOW LENGTH(FEET) =  2092.67   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  14.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.60
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      36.37
  PIPE TRAVEL TIME(MIN.) =   2.57    Tc(MIN.) =   27.13
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13860.00 =    6208.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   27.13
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.924
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.41      0.50     0.707     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.707
  SUBAREA AREA(ACRES) =   43.41      SUBAREA RUNOFF(CFS) =   22.29
  EFFECTIVE AREA(ACRES) =    123.22   AREA-AVERAGED Fm(INCH/HR) =  0.43
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      123.2       PEAK FLOW RATE(CFS) =      54.84

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.13
```



```
  RAINFALL INTENSITY(INCH/HR) =   0.92
  AREA-AVERAGED Fm(INCH/HR) =  0.43
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.86
  EFFECTIVE STREAM AREA(ACRES) =     123.22
  TOTAL STREAM AREA(ACRES) =     123.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      54.84

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1    14898.93   25.31    0.959  0.50( 0.48) 0.96    5430.2   13810.00
      1    14877.06   32.99    0.831  0.50( 0.48) 0.97    7185.1   10300.00
      1    14684.87   41.63    0.728  0.50( 0.49) 0.97   10207.5   10400.00
      1    14622.87   43.51    0.712  0.50( 0.49) 0.97   10942.3   13830.00
      1    14275.71   52.89    0.641  0.50( 0.49) 0.97   14488.7   50300.00
      1    13325.23   67.08    0.572  0.50( 0.49) 0.97   20532.6   20400.00
      1    12712.15   74.77    0.546  0.50( 0.48) 0.97   23448.3   20100.00
      1    11768.75   89.23    0.496  0.50( 0.48) 0.97   28552.1   11801.00
      1    11155.75  101.13    0.471  0.50( 0.48) 0.97   32553.6   11500.00
      1    10506.70  113.67    0.446  0.50( 0.48) 0.97   37222.4   11000.00
      1     9808.57  128.68    0.423  0.50( 0.48) 0.97   44027.6   13000.00
      1     8720.33  146.50    0.402  0.50( 0.49) 0.97   51273.5   11130.00
      1     8203.82  155.09    0.391  0.50( 0.49) 0.97   53969.4   13510.00
      1     6893.23  175.70    0.367  0.50( 0.49) 0.97   59660.8   12400.00
      1     6165.33  186.03    0.359  0.50( 0.49) 0.97   61608.1   13500.00
      1     5410.30  198.18    0.352  0.50( 0.49) 0.97   63273.7   12111.00
      1     4477.55  215.48    0.343  0.50( 0.49) 0.97   65200.7   12261.00
      1     4005.12  225.79    0.337  0.50( 0.49) 0.98   66012.5   10200.00
      1     3436.93  242.50    0.328  0.50( 0.49) 0.98   67249.8   10300.00
      1     3203.85  249.96    0.324  0.50( 0.49) 0.98   67600.9   12010.00
      1     2718.67  272.05    0.312  0.50( 0.49) 0.98   67930.2   12000.00
      1     1714.43  345.49    0.273  0.50( 0.49) 0.98   68600.5   10100.00
      2       54.84   27.13    0.924  0.50( 0.43) 0.86     123.2   13850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1    14953.71   25.31    0.959  0.50( 0.48) 0.96    5545.1   13810.00
      2    14948.58   27.13    0.924  0.50( 0.48) 0.96    5970.2   13850.00
      3    14921.55   32.99    0.831  0.50( 0.48) 0.97    7308.3   10300.00
      4    14717.92   41.63    0.728  0.50( 0.48) 0.97   10330.7   10400.00
      5    14654.22   43.51    0.712  0.50( 0.48) 0.97   11065.5   13830.00
      6    14299.17   52.89    0.641  0.50( 0.49) 0.97   14611.9   50300.00
      7    13341.08   67.08    0.572  0.50( 0.49) 0.97   20655.8   20400.00
      8    12725.04   74.77    0.546  0.50( 0.48) 0.97   23571.5   20100.00
      9    11776.51   89.23    0.496  0.50( 0.48) 0.97   28675.3   11801.00
     10    11163.12  101.13    0.471  0.50( 0.48) 0.97   32676.8   11500.00
     11    10513.68  113.67    0.446  0.50( 0.48) 0.97   37345.6   11000.00
     12     9815.19  128.68    0.423  0.50( 0.48) 0.97   44150.9   13000.00
     13     8726.63  146.50    0.402  0.50( 0.49) 0.97   51396.7   11130.00
     14     8209.95  155.09    0.391  0.50( 0.49) 0.97   54092.6   13510.00
     15     6898.98  175.70    0.367  0.50( 0.49) 0.97   59784.0   12400.00
     16     6170.95  186.03    0.359  0.50( 0.49) 0.97   61731.3   13500.00
     17     5415.82  198.18    0.352  0.50( 0.49) 0.97   63396.9   12111.00
```

18	4482.92	215.48	0.343	0.50(0.49)	0.97	65323.9	12261.00
19	4010.41	225.79	0.337	0.50(0.49)	0.97	66135.7	10200.00
20	3442.07	242.50	0.328	0.50(0.49)	0.98	67373.0	10300.00
21	3208.94	249.96	0.324	0.50(0.49)	0.98	67724.1	12010.00
22	2723.56	272.05	0.312	0.50(0.49)	0.98	68053.5	12000.00
23	1718.70	345.49	0.273	0.50(0.49)	0.98	68723.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 14953.71 Tc(MIN.) = 25.31
EFFECTIVE AREA(ACRES) = 5545.12 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 68723.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

****
FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 130.00 DOWNSTREAM(FEET) = 120.57
CHANNEL LENGTH THRU SUBAREA(FEET) = 610.77 CHANNEL SLOPE = 0.0154
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.950
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.89	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14954.70
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 22.62
AVERAGE FLOW DEPTH(FEET) = 14.84 TRAVEL TIME(MIN.) = 0.45
Tc(MIN.) = 25.76
SUBAREA AREA(ACRES) = 4.89 SUBAREA RUNOFF(CFS) = 1.98
EFFECTIVE AREA(ACRES) = 5550.01 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 68728.6 PEAK FLOW RATE(CFS) = 14953.71
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 14.84 FLOW VELOCITY(FEET/SEC.) = 22.62
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14953.71	25.76	0.950	0.50(0.48)	0.96	5550.0	13810.00
2	14948.58	27.58	0.915	0.50(0.48)	0.96	5975.1	13850.00
3	14921.55	33.44	0.825	0.50(0.48)	0.97	7313.2	10300.00
4	14717.92	42.09	0.724	0.50(0.48)	0.97	10335.6	10400.00
5	14654.22	43.96	0.708	0.50(0.48)	0.97	11070.4	13830.00
6	14299.17	53.35	0.638	0.50(0.49)	0.97	14616.8	50300.00
7	13341.08	67.54	0.571	0.50(0.49)	0.97	20660.7	20400.00
8	12725.04	75.23	0.544	0.50(0.48)	0.97	23576.4	20100.00
9	11776.51	89.71	0.494	0.50(0.48)	0.97	28680.2	11801.00
10	11163.12	101.62	0.470	0.50(0.48)	0.97	32681.7	11500.00

11	10513.68	114.16	0.445	0.50(0.48)	0.97	37350.5	11000.00
12	9815.19	129.18	0.422	0.50(0.48)	0.97	44155.7	13000.00
13	8726.63	147.01	0.401	0.50(0.49)	0.97	51401.6	11130.00
14	8209.95	155.61	0.391	0.50(0.49)	0.97	54097.5	13510.00
15	6898.98	176.25	0.366	0.50(0.49)	0.97	59788.9	12400.00
16	6170.95	186.59	0.358	0.50(0.49)	0.97	61736.2	13500.00
17	5415.82	198.76	0.352	0.50(0.49)	0.97	63401.8	12111.00
18	4482.92	216.09	0.343	0.50(0.49)	0.97	65328.8	12261.00
19	4010.41	226.42	0.337	0.50(0.49)	0.97	66140.6	10200.00
20	3442.07	243.15	0.328	0.50(0.49)	0.98	67377.9	10300.00
21	3208.94	250.62	0.324	0.50(0.49)	0.98	67729.0	12010.00
22	2723.56	272.74	0.312	0.50(0.49)	0.98	68058.4	12000.00
23	1718.70	346.26	0.272	0.50(0.49)	0.98	68728.6	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 14953.71 Tc(MIN.) = 25.76
AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 5550.01

****
FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 25.76
RAINFALL INTENSITY(INCH/HR) = 0.95
AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.96
EFFECTIVE STREAM AREA(ACRES) = 5550.01
TOTAL STREAM AREA(ACRES) = 68728.56
PEAK FLOW RATE(CFS) AT CONFLUENCE = 14953.71

****
FLOW PROCESS FROM NODE 13870.00 TO NODE 13871.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========
INITIAL SUBAREA FLOW-LENGTH(FEET) = 872.65
ELEVATION DATA: UPSTREAM(FEET) = 558.52 DOWNSTREAM(FEET) = 436.47

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.704
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.266
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "GRASS"	-	9.32	0.50	1.000	0	15.70

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 6.42
TOTAL AREA(ACRES) = 9.32 PEAK FLOW RATE(CFS) = 6.42

****
FLOW PROCESS FROM NODE 13871.00 TO NODE 13872.00 IS CODE = 51

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.47  DOWNSTREAM(FEET) =    337.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =   827.95   CHANNEL SLOPE =  0.1194
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.156
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.27      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.72
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   2.92
  Tc(MIN.) =   18.63
  SUBAREA AREA(ACRES) =    14.27       SUBAREA RUNOFF(CFS) =    8.43
  EFFECTIVE AREA(ACRES) =     23.59     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =      13.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   5.06
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13872.00 =    1700.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13872.00 TO NODE  13873.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    337.62  DOWNSTREAM(FEET) =    253.88
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1049.16   CHANNEL SLOPE =  0.0798
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.060   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.044
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.74      0.50     0.923     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.923
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.94
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   3.54
  Tc(MIN.) =   22.16
  SUBAREA AREA(ACRES) =    35.74       SUBAREA RUNOFF(CFS) =   18.74
  EFFECTIVE AREA(ACRES) =     59.33     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =       59.3         PEAK FLOW RATE(CFS) =      30.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   5.27
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13873.00 =    2749.76 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13873.00 TO NODE  13874.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    253.88  DOWNSTREAM(FEET) =    160.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1518.60   CHANNEL SLOPE =  0.0613
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.948
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.43      0.50     0.900     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.84
  AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   3.70
  Tc(MIN.) =   25.86
  SUBAREA AREA(ACRES) =    32.43       SUBAREA RUNOFF(CFS) =   14.54
  EFFECTIVE AREA(ACRES) =     91.76     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       91.8         PEAK FLOW RATE(CFS) =      39.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   6.91
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13874.00 =    4268.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13874.00 TO NODE  13875.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    160.73  DOWNSTREAM(FEET) =    158.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   582.74   CHANNEL SLOPE =  0.0044
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.882
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.67      0.50     0.930     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.930
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.79
  AVERAGE FLOW DEPTH(FEET) =   2.53   TRAVEL TIME(MIN.) =   3.48
  Tc(MIN.) =   29.34
  SUBAREA AREA(ACRES) =    73.67       SUBAREA RUNOFF(CFS) =   27.61
  EFFECTIVE AREA(ACRES) =    165.43     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =      165.4         PEAK FLOW RATE(CFS) =      61.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.67   FLOW VELOCITY(FEET/SEC.) =   2.90
```

```
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13875.00 =    4851.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.14  DOWNSTREAM(FEET) =   120.57
  FLOW LENGTH(FEET) =  1855.67   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  21.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.72
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      61.81
  PIPE TRAVEL TIME(MIN.) =   2.25    Tc(MIN.) =   31.60
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13880.00 =    6706.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   31.60
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.849
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.90      0.50     0.743     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.743
  SUBAREA AREA(ACRES) =   34.90      SUBAREA RUNOFF(CFS) =   14.98
  EFFECTIVE AREA(ACRES) =    200.33   AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.90
  TOTAL AREA(ACRES) =      200.3       PEAK FLOW RATE(CFS) =      71.87

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.60
  RAINFALL INTENSITY(INCH/HR) =   0.85
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.90
  EFFECTIVE STREAM AREA(ACRES) =     200.33
  TOTAL STREAM AREA(ACRES) =     200.33
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      71.87

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14953.71   25.76    0.950  0.50( 0.48) 0.96    5550.0   13810.00
      1    14948.58   27.58    0.915  0.50( 0.48) 0.96    5975.1   13850.00
```



```
      1    14921.55   33.44    0.825  0.50( 0.48) 0.97    7313.2   10300.00
      1    14717.92   42.09    0.724  0.50( 0.48) 0.97   10335.6   10400.00
      1    14654.22   43.96    0.708  0.50( 0.48) 0.97   11070.4   13830.00
      1    14299.17   53.35    0.638  0.50( 0.49) 0.97   14616.8   50300.00
      1    13341.08   67.54    0.571  0.50( 0.49) 0.97   20660.7   20400.00
      1    12725.04   75.23    0.544  0.50( 0.48) 0.97   23576.4   20100.00
      1    11776.51   89.71    0.494  0.50( 0.48) 0.97   28680.2   11801.00
      1    11163.12  101.62    0.470  0.50( 0.48) 0.97   32681.7   11500.00
      1    10513.68  114.16    0.445  0.50( 0.48) 0.97   37350.5   11000.00
      1     9815.19  129.18    0.422  0.50( 0.48) 0.97   44155.7   13000.00
      1     8726.63  147.01    0.401  0.50( 0.49) 0.97   51401.6   11130.00
      1     8209.95  155.61    0.391  0.50( 0.49) 0.97   54097.5   13510.00
      1     6898.98  176.25    0.366  0.50( 0.49) 0.97   59788.9   12400.00
      1     6170.95  186.59    0.358  0.50( 0.49) 0.97   61736.2   13500.00
      1     5415.82  198.76    0.352  0.50( 0.49) 0.97   63401.8   12111.00
      1     4482.92  216.09    0.343  0.50( 0.49) 0.97   65328.8   12261.00
      1     4010.41  226.42    0.337  0.50( 0.49) 0.97   66140.6   10200.00
      1     3442.07  243.15    0.328  0.50( 0.49) 0.98   67377.9   10300.00
      1     3208.94  250.62    0.324  0.50( 0.49) 0.98   67729.0   12010.00
      1     2723.56  272.74    0.312  0.50( 0.49) 0.98   68058.4   12000.00
      1     1718.70  346.26    0.272  0.50( 0.49) 0.98   68728.6   10100.00
      2       71.87   31.60    0.849  0.50( 0.45) 0.90     200.3   13870.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    15025.58   25.76    0.950  0.50( 0.48) 0.96    5713.3   13810.00
      2    15020.45   27.58    0.915  0.50( 0.48) 0.96    6149.9   13850.00
      3    15001.93   31.60    0.849  0.50( 0.48) 0.96    7092.0   13870.00
      4    14989.15   33.44    0.825  0.50( 0.48) 0.96    7513.5   10300.00
      5    14767.31   42.09    0.724  0.50( 0.48) 0.97   10535.9   10400.00
      6    14700.83   43.96    0.708  0.50( 0.48) 0.97   11270.7   13830.00
      7    14333.11   53.35    0.638  0.50( 0.49) 0.97   14817.2   50300.00
      8    13362.88   67.54    0.571  0.50( 0.49) 0.97   20861.0   20400.00
      9    12742.03   75.23    0.544  0.50( 0.48) 0.97   23776.7   20100.00
     10    11785.46   89.71    0.494  0.50( 0.48) 0.97   28880.5   11801.00
     11    11171.63  101.62    0.470  0.50( 0.48) 0.96   32882.1   11500.00
     12    10521.73  114.16    0.445  0.50( 0.48) 0.97   37550.9   11000.00
     13     9822.84  129.18    0.422  0.50( 0.48) 0.97   44356.1   13000.00
     14     8733.89  147.01    0.401  0.50( 0.49) 0.97   51601.9   11130.00
     15     8217.03  155.61    0.391  0.50( 0.49) 0.97   54297.9   13510.00
     16     6905.61  176.25    0.366  0.50( 0.49) 0.97   59989.2   12400.00
     17     6177.44  186.59    0.358  0.50( 0.49) 0.97   61936.5   13500.00
     18     5422.19  198.76    0.352  0.50( 0.49) 0.97   63602.2   12111.00
     19     4489.12  216.09    0.343  0.50( 0.49) 0.97   65529.1   12261.00
     20     4016.51  226.42    0.337  0.50( 0.49) 0.97   66340.9   10200.00
     21     3448.01  243.15    0.328  0.50( 0.49) 0.98   67578.3   10300.00
     22     3214.80  250.62    0.324  0.50( 0.49) 0.98   67929.4   12010.00
     23     2729.21  272.74    0.312  0.50( 0.49) 0.98   68258.7   12000.00
     24     1723.63  346.26    0.272  0.50( 0.49) 0.98   68928.9   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   15025.58    Tc(MIN.) =    25.76
  EFFECTIVE AREA(ACRES) =    5713.32   AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.96
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  TOTAL AREA(ACRES) =    68928.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13880.00 =  134069.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    120.57  DOWNSTREAM(FEET) =    119.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1190.21   CHANNEL SLOPE =  0.0007
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.920
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.69      0.50     0.724     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.724
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   15055.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.55
  AVERAGE FLOW DEPTH(FEET) =  20.00   TRAVEL TIME(MIN.) =   1.58
  Tc(MIN.) =   27.34
  SUBAREA AREA(ACRES) =   117.69       SUBAREA RUNOFF(CFS) =   59.10
  EFFECTIVE AREA(ACRES) =   5831.01     AREA-AVERAGED Fm(INCH/HR) =   0.48
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =    69046.6         PEAK FLOW RATE(CFS) =   15025.58
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.


  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 20.00   FLOW VELOCITY(FEET/SEC.) =  12.52

  ==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13910.00 =  135259.69 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    15025.58   27.34    0.920  0.50( 0.48) 0.96    5831.0   13810.00
      2    15020.45   29.16    0.885  0.50( 0.48) 0.96    6267.6   13850.00
      3    15001.93   33.18    0.828  0.50( 0.48) 0.96    7209.7   13870.00
      4    14989.15   35.03    0.805  0.50( 0.48) 0.96    7631.2   10300.00
```



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      5    14767.31   43.70    0.711  0.50( 0.48) 0.96   10653.6   10400.00
      6    14700.83   45.58    0.695  0.50( 0.48) 0.97   11388.4   13830.00
      7    14333.11   55.01    0.628  0.50( 0.48) 0.97   14934.9   50300.00
      8    13362.88   69.32    0.565  0.50( 0.48) 0.97   20978.7   20400.00
      9    12742.03   77.10    0.538  0.50( 0.48) 0.97   23894.4   20100.00
     10    11785.46   91.73    0.490  0.50( 0.48) 0.96   28998.2   11801.00
     11    11171.63  103.74    0.466  0.50( 0.48) 0.96   32999.8   11500.00
     12    10521.73  116.43    0.440  0.50( 0.48) 0.97   37668.6   11000.00
     13     9822.84  131.60    0.419  0.50( 0.48) 0.97   44473.8   13000.00
     14     8733.89  149.74    0.398  0.50( 0.49) 0.97   51719.6   11130.00
     15     8217.03  158.51    0.387  0.50( 0.49) 0.97   54415.6   13510.00
     16     6905.61  179.59    0.362  0.50( 0.49) 0.97   60106.9   12400.00
     17     6177.44  190.02    0.357  0.50( 0.49) 0.97   62054.2   13500.00
     18     5422.19  202.31    0.350  0.50( 0.49) 0.97   63719.9   12111.00
     19     4489.12  219.80    0.341  0.50( 0.49) 0.97   65646.8   12261.00
     20     4016.51  230.24    0.335  0.50( 0.49) 0.97   66458.6   10200.00
     21     3448.01  247.12    0.326  0.50( 0.49) 0.97   67695.9   10300.00
     22     3214.80  254.66    0.322  0.50( 0.49) 0.97   68047.1   12010.00
     23     2729.21  276.95    0.310  0.50( 0.49) 0.97   68376.4   12000.00
     24     1723.63  350.99    0.270  0.50( 0.49) 0.98   69046.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   15025.58  Tc(MIN.) =   27.34
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    5831.01

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.34
  RAINFALL INTENSITY(INCH/HR) =   0.92
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.96
  EFFECTIVE STREAM AREA(ACRES) =    5831.01
  TOTAL STREAM AREA(ACRES) =   69046.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   15025.58

****************************************************************************
  FLOW PROCESS FROM NODE  13889.00 TO NODE  13890.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   447.89
  ELEVATION DATA: UPSTREAM(FEET) =    564.89  DOWNSTREAM(FEET) =    421.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.976
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.250
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                -        3.03      0.50     0.960     0    6.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
```

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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.960
  SUBAREA RUNOFF(CFS) =      4.83
  TOTAL AREA(ACRES) =      3.03   PEAK FLOW RATE(CFS) =      4.83

****************************************************************************
  FLOW PROCESS FROM NODE  13890.00 TO NODE  13891.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    421.92  DOWNSTREAM(FEET) =    392.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   435.33   CHANNEL SLOPE =  0.0673
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.008
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.12      0.50     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.13
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   1.41
  Tc(MIN.) =    8.39
  SUBAREA AREA(ACRES) =     8.12       SUBAREA RUNOFF(CFS) =   11.07
  EFFECTIVE AREA(ACRES) =     11.15     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       11.1         PEAK FLOW RATE(CFS) =      15.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   5.64
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13891.00 =     883.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13891.00 TO NODE  13892.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    392.64  DOWNSTREAM(FEET) =    324.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =   662.40   CHANNEL SLOPE =  0.1029
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.748
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       12.50      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.28
  AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   1.52
  Tc(MIN.) =    9.91
  SUBAREA AREA(ACRES) =    12.50       SUBAREA RUNOFF(CFS) =   14.04
  EFFECTIVE AREA(ACRES) =     23.65     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
```



```
  TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =      26.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   7.64
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13892.00 =    1545.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13892.00 TO NODE  13893.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    324.46  DOWNSTREAM(FEET) =    240.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   980.03   CHANNEL SLOPE =  0.0853
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.551
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.87      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.59
  AVERAGE FLOW DEPTH(FEET) =   1.23   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   12.06
  SUBAREA AREA(ACRES) =    15.87       SUBAREA RUNOFF(CFS) =   15.00
  EFFECTIVE AREA(ACRES) =     39.52     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       39.5         PEAK FLOW RATE(CFS) =      37.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.27   FLOW VELOCITY(FEET/SEC.) =   7.75
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13893.00 =    2525.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13893.00 TO NODE  13894.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.82  DOWNSTREAM(FEET) =    163.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1144.35   CHANNEL SLOPE =  0.0680
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.330
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.41      0.50     0.985     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.985
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.60
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   14.57
  SUBAREA AREA(ACRES) =    28.41       SUBAREA RUNOFF(CFS) =   21.40
```

```
  EFFECTIVE AREA(ACRES) =     67.93     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =      51.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.49   FLOW VELOCITY(FEET/SEC.) =   7.65
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13894.00 =    3670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   163.04  DOWNSTREAM(FEET) =   119.70
  FLOW LENGTH(FEET) =  1899.01   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  18.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.74
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      51.02
  PIPE TRAVEL TIME(MIN.) =   2.30    Tc(MIN.) =   16.87
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13910.00 =    5569.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.87
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.222
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.69      0.50     0.634     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.634
  SUBAREA AREA(ACRES) =   11.69      SUBAREA RUNOFF(CFS) =    9.52
  EFFECTIVE AREA(ACRES) =     79.62   AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.94
  TOTAL AREA(ACRES) =       79.6       PEAK FLOW RATE(CFS) =      53.94

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.87
  RAINFALL INTENSITY(INCH/HR) =   1.22
  AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.50
  AREA-AVERAGED Ap =  0.94
  EFFECTIVE STREAM AREA(ACRES) =      79.62
  TOTAL STREAM AREA(ACRES) =      79.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      53.94
```



```
** CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1    15025.58   27.34    0.920  0.50( 0.48) 0.96    5831.0   13810.00
    1    15020.45   29.16    0.885  0.50( 0.48) 0.96    6267.6   13850.00
    1    15001.93   33.18    0.828  0.50( 0.48) 0.96    7209.7   13870.00
    1    14989.15   35.03    0.805  0.50( 0.48) 0.96    7631.2   10300.00
    1    14767.31   43.70    0.711  0.50( 0.48) 0.96   10653.6   10400.00
    1    14700.83   45.58    0.695  0.50( 0.48) 0.97   11388.4   13830.00
    1    14333.11   55.01    0.628  0.50( 0.48) 0.97   14934.9   50300.00
    1    13362.88   69.32    0.565  0.50( 0.48) 0.97   20978.7   20400.00
    1    12742.03   77.10    0.538  0.50( 0.48) 0.97   23894.4   20100.00
    1    11785.46   91.73    0.490  0.50( 0.48) 0.96   28998.2   11801.00
    1    11171.63  103.74    0.466  0.50( 0.48) 0.96   32999.8   11500.00
    1    10521.73  116.43    0.440  0.50( 0.48) 0.97   37668.6   11000.00
    1     9822.84  131.60    0.419  0.50( 0.48) 0.97   44473.8   13000.00
    1     8733.89  149.74    0.398  0.50( 0.49) 0.97   51719.6   11130.00
    1     8217.03  158.51    0.387  0.50( 0.49) 0.97   54415.6   13510.00
    1     6905.61  179.59    0.362  0.50( 0.49) 0.97   60106.9   12400.00
    1     6177.44  190.02    0.357  0.50( 0.49) 0.97   62054.2   13500.00
    1     5422.19  202.31    0.350  0.50( 0.49) 0.97   63719.9   12111.00
    1     4489.12  219.80    0.341  0.50( 0.49) 0.97   65646.8   12261.00
    1     4016.51  230.24    0.335  0.50( 0.49) 0.97   66458.6   10200.00
    1     3448.01  247.12    0.326  0.50( 0.49) 0.97   67695.9   10300.00
    1     3214.80  254.66    0.322  0.50( 0.49) 0.97   68047.1   12010.00
    1     2729.21  276.95    0.310  0.50( 0.49) 0.97   68376.4   12000.00
    1     1723.63  350.99    0.270  0.50( 0.49) 0.98   69046.6   10100.00
    2       53.94   16.87    1.222  0.50( 0.47) 0.94      79.6   13889.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1    15079.52   16.87    1.222  0.50( 0.48) 0.96    3678.4   13889.00
    2    15057.89   27.34    0.920  0.50( 0.48) 0.96    5910.6   13810.00
    3    15050.25   29.16    0.885  0.50( 0.48) 0.96    6347.2   13850.00
    4    15027.66   33.18    0.828  0.50( 0.48) 0.96    7289.3   13870.00
    5    15013.19   35.03    0.805  0.50( 0.48) 0.96    7710.8   10300.00
    6    14784.62   43.70    0.711  0.50( 0.48) 0.96   10733.2   10400.00
    7    14717.03   45.58    0.695  0.50( 0.48) 0.97   11468.0   13830.00
    8    14344.49   55.01    0.628  0.50( 0.48) 0.97   15014.5   50300.00
    9    13369.73   69.32    0.565  0.50( 0.48) 0.97   21058.3   20400.00
   10    12746.94   77.10    0.538  0.50( 0.48) 0.97   23974.0   20100.00
   11    11787.64   91.73    0.490  0.50( 0.48) 0.96   29077.8   11801.00
   12    11173.70  103.74    0.466  0.50( 0.48) 0.96   33079.4   11500.00
   13    10523.69  116.43    0.440  0.50( 0.48) 0.97   37748.2   11000.00
   14     9824.70  131.60    0.419  0.50( 0.48) 0.97   44553.4   13000.00
   15     8735.66  149.74    0.398  0.50( 0.49) 0.97   51799.3   11130.00
   16     8218.75  158.51    0.387  0.50( 0.49) 0.97   54495.2   13510.00
   17     6907.22  179.59    0.362  0.50( 0.49) 0.97   60186.5   12400.00
   18     6179.03  190.02    0.357  0.50( 0.49) 0.97   62133.8   13500.00
   19     5423.75  202.31    0.350  0.50( 0.49) 0.97   63799.5   12111.00
   20     4490.64  219.80    0.341  0.50( 0.49) 0.97   65726.4   12261.00
   21     4018.00  230.24    0.335  0.50( 0.49) 0.97   66538.2   10200.00
   22     3449.46  247.12    0.326  0.50( 0.49) 0.97   67775.6   10300.00
```

23	3216.23	254.66	0.322	0.50(0.49)	0.97	68126.7	12010.00
24	2730.59	276.95	0.310	0.50(0.49)	0.97	68456.0	12000.00
25	1724.83	350.99	0.270	0.50(0.49)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 15079.52 Tc(MIN.) = 16.87
EFFECTIVE AREA(ACRES) = 3678.42 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 69126.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 69126.2 TC(MIN.) = 16.87
EFFECTIVE AREA(ACRES) = 3678.42 AREA-AVERAGED Fm(INCH/HR)= 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.956
PEAK FLOW RATE(CFS) = 15079.52

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15079.52	16.87	1.222	0.50(0.48)	0.96	3678.4	13889.00
2	15057.89	27.34	0.920	0.50(0.48)	0.96	5910.6	13810.00
3	15050.25	29.16	0.885	0.50(0.48)	0.96	6347.2	13850.00
4	15027.66	33.18	0.828	0.50(0.48)	0.96	7289.3	13870.00
5	15013.19	35.03	0.805	0.50(0.48)	0.96	7710.8	10300.00
6	14784.62	43.70	0.711	0.50(0.48)	0.96	10733.2	10400.00
7	14717.03	45.58	0.695	0.50(0.48)	0.97	11468.0	13830.00
8	14344.49	55.01	0.628	0.50(0.48)	0.97	15014.5	50300.00
9	13369.73	69.32	0.565	0.50(0.48)	0.97	21058.3	20400.00
10	12746.94	77.10	0.538	0.50(0.48)	0.97	23974.0	20100.00
11	11787.64	91.73	0.490	0.50(0.48)	0.96	29077.8	11801.00
12	11173.70	103.74	0.466	0.50(0.48)	0.96	33079.4	11500.00
13	10523.69	116.43	0.440	0.50(0.48)	0.97	37748.2	11000.00
14	9824.70	131.60	0.419	0.50(0.48)	0.97	44553.4	13000.00
15	8735.66	149.74	0.398	0.50(0.49)	0.97	51799.3	11130.00
16	8218.75	158.51	0.387	0.50(0.49)	0.97	54495.2	13510.00
17	6907.22	179.59	0.362	0.50(0.49)	0.97	60186.5	12400.00
18	6179.03	190.02	0.357	0.50(0.49)	0.97	62133.8	13500.00
19	5423.75	202.31	0.350	0.50(0.49)	0.97	63799.5	12111.00
20	4490.64	219.80	0.341	0.50(0.49)	0.97	65726.4	12261.00
21	4018.00	230.24	0.335	0.50(0.49)	0.97	66538.2	10200.00
22	3449.46	247.12	0.326	0.50(0.49)	0.97	67775.6	10300.00
23	3216.23	254.66	0.322	0.50(0.49)	0.97	68126.7	12010.00
24	2730.59	276.95	0.310	0.50(0.49)	0.97	68456.0	12000.00
25	1724.83	350.99	0.270	0.50(0.49)	0.98	69126.2	10100.00

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END OF RATIONAL METHOD ANALYSIS

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******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

------------------------------------------------------------------------------
  FILE NAME: S39.DAT
  TIME/DATE OF STUDY: 07:32 07/20/2018
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  2.586
   2)   10.00;  1.731
   3)   15.00;  1.292
   4)   20.00;  1.104
   5)   25.00;  0.965
   6)   30.00;  0.869
   7)   40.00;  0.741
   8)   50.00;  0.658
   9)   60.00;  0.596
  10)   90.00;  0.493
  11)  120.00;  0.433
  12)  180.00;  0.362
  13)  360.00;  0.264
  14) 1200.00;  0.115
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
******************************************************************************
  FLOW PROCESS FROM NODE  13900.00 TO NODE  13901.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   600.65
  ELEVATION DATA: UPSTREAM(FEET) =    442.40  DOWNSTREAM(FEET) =    385.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.859
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.656
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  AGRICULTURAL POOR COVER
  "FALLOW"                   -        4.00      0.50     1.000     0   10.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.16
  TOTAL AREA(ACRES) =      4.00   PEAK FLOW RATE(CFS) =      4.16

******************************************************************************
  FLOW PROCESS FROM NODE  13901.00 TO NODE  13902.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    385.16  DOWNSTREAM(FEET) =    288.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   647.42   CHANNEL SLOPE =  0.1497
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.509
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.47      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.45
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   1.67
  Tc(MIN.) =   12.53
  SUBAREA AREA(ACRES) =     8.47       SUBAREA RUNOFF(CFS) =    7.69
  EFFECTIVE AREA(ACRES) =     12.47     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.5          PEAK FLOW RATE(CFS) =      11.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.73   FLOW VELOCITY(FEET/SEC.) =   7.09
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13902.00 =    1248.07 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  13902.00 TO NODE  13903.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    288.21  DOWNSTREAM(FEET) =    184.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   669.27   CHANNEL SLOPE =  0.1544
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.392
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.85      0.50     0.982     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.982
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.40
  AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =   1.33
  Tc(MIN.) =   13.86
  SUBAREA AREA(ACRES) =    23.85       SUBAREA RUNOFF(CFS) =   19.34
  EFFECTIVE AREA(ACRES) =     36.32     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       36.3         PEAK FLOW RATE(CFS) =      29.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   9.14
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13903.00 =    1917.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   184.89  DOWNSTREAM(FEET) =   155.08
  FLOW LENGTH(FEET) =   876.66   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  12.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.74
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.35
  PIPE TRAVEL TIME(MIN.) =   1.06    Tc(MIN.) =   14.92
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13904.00 =    2794.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.92
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.299
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.29      0.50     0.996     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.996
  SUBAREA AREA(ACRES) =   21.29      SUBAREA RUNOFF(CFS) =   15.34
  EFFECTIVE AREA(ACRES) =     57.61   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =       57.6       PEAK FLOW RATE(CFS) =      41.63
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.08  DOWNSTREAM(FEET) =   118.00
  FLOW LENGTH(FEET) =  1961.38   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  17.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.17
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.63
  PIPE TRAVEL TIME(MIN.) =   2.69    Tc(MIN.) =   17.61
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.61
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.194
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.53      0.50     0.649     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.649
  SUBAREA AREA(ACRES) =   43.53      SUBAREA RUNOFF(CFS) =   34.06
  EFFECTIVE AREA(ACRES) =    101.14   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =      101.1       PEAK FLOW RATE(CFS) =      70.25

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S38.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    15079.52   16.87  0.50( 0.48) 0.96    3678.4   13889.00
      2    15057.89   27.34  0.50( 0.48) 0.96    5910.6   13810.00
      3    14784.62   43.70  0.50( 0.48) 0.96   10733.2   10400.00
      4    14344.49   55.01  0.50( 0.48) 0.97   15014.5   50300.00
      5    13369.73   69.32  0.50( 0.48) 0.97   21058.3   20400.00
      6    11787.64   91.73  0.50( 0.48) 0.96   29077.8   11801.00
      7    11173.70  103.74  0.50( 0.48) 0.96   33079.4   11500.00
      8    10523.69  116.43  0.50( 0.48) 0.97   37748.2   11000.00
      9     9824.70  131.60  0.50( 0.48) 0.97   44553.4   13000.00
```

```
     10     8735.66  149.74  0.50( 0.49) 0.97   51799.3   11130.00
     11     8218.75  158.51  0.50( 0.49) 0.97   54495.2   13510.00
     12     6907.22  179.59  0.50( 0.49) 0.97   60186.5   12400.00
     13     6179.03  190.02  0.50( 0.49) 0.97   62133.8   13500.00
     14     5423.75  202.31  0.50( 0.49) 0.97   63799.5   12111.00
     15     4490.64  219.80  0.50( 0.49) 0.97   65726.4   12261.00
     16     4018.00  230.24  0.50( 0.49) 0.97   66538.2   10200.00
     17     3449.46  247.12  0.50( 0.49) 0.97   67775.6   10300.00
     18     3216.23  254.66  0.50( 0.49) 0.97   68126.7   12010.00
     19     2730.59  276.95  0.50( 0.49) 0.97   68456.0   12000.00
     20     1724.83  350.99  0.50( 0.49) 0.98   69126.2   10100.00
    TOTAL AREA(ACRES) =    69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    15079.52   16.87  0.50( 0.48) 0.96    3678.4   13889.00
      2    15057.89   27.34  0.50( 0.48) 0.96    5910.6   13810.00
      3    14784.62   43.70  0.50( 0.48) 0.96   10733.2   10400.00
      4    14344.49   55.01  0.50( 0.48) 0.97   15014.5   50300.00
      5    13369.73   69.32  0.50( 0.48) 0.97   21058.3   20400.00
      6    11787.64   91.73  0.50( 0.48) 0.96   29077.8   11801.00
      7    11173.70  103.74  0.50( 0.48) 0.96   33079.4   11500.00
      8    10523.69  116.43  0.50( 0.48) 0.97   37748.2   11000.00
      9     9824.70  131.60  0.50( 0.48) 0.97   44553.4   13000.00
     10     8735.66  149.74  0.50( 0.49) 0.97   51799.3   11130.00
     11     8218.75  158.51  0.50( 0.49) 0.97   54495.2   13510.00
     12     6907.22  179.59  0.50( 0.49) 0.97   60186.5   12400.00
     13     6179.03  190.02  0.50( 0.49) 0.97   62133.8   13500.00
     14     5423.75  202.31  0.50( 0.49) 0.97   63799.5   12111.00
     15     4490.64  219.80  0.50( 0.49) 0.97   65726.4   12261.00
     16     4018.00  230.24  0.50( 0.49) 0.97   66538.2   10200.00
     17     3449.46  247.12  0.50( 0.49) 0.97   67775.6   10300.00
     18     3216.23  254.66  0.50( 0.49) 0.97   68126.7   12010.00
     19     2730.59  276.95  0.50( 0.49) 0.97   68456.0   12000.00
     20     1724.83  350.99  0.50( 0.49) 0.98   69126.2   10100.00
    TOTAL AREA(ACRES) =     69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13920.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    119.70  DOWNSTREAM(FEET) =    118.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1376.26   CHANNEL SLOPE =  0.0012
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
```



```
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.153
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.09      0.50     0.535     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.535
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   15117.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.60
  AVERAGE FLOW DEPTH(FEET) =  20.00   TRAVEL TIME(MIN.) =   1.82
  Tc(MIN.) =   18.69
  SUBAREA AREA(ACRES) =    96.09       SUBAREA RUNOFF(CFS) =   76.58
  EFFECTIVE AREA(ACRES) =   3774.51     AREA-AVERAGED Fm(INCH/HR) =   0.47
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =    69222.3         PEAK FLOW RATE(CFS) =   15079.52
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.


  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 20.00   FLOW VELOCITY(FEET/SEC.) =  12.57

  ==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    15079.52   18.69    1.153  0.50( 0.47) 0.95    3774.5   13889.00
      2    15057.89   29.16    0.885  0.50( 0.47) 0.95    6006.7   13810.00
      3    14784.62   45.56    0.695  0.50( 0.48) 0.96   10829.3   10400.00
      4    14344.49   56.92    0.615  0.50( 0.48) 0.97   15110.6   50300.00
      5    13369.73   71.38    0.557  0.50( 0.48) 0.97   21154.4   20400.00
      6    11787.64   94.06    0.485  0.50( 0.48) 0.96   29173.9   11801.00
      7    11173.70  106.21    0.461  0.50( 0.48) 0.96   33175.5   11500.00
      8    10523.69  119.04    0.435  0.50( 0.48) 0.96   37844.3   11000.00
      9     9824.70  134.40    0.416  0.50( 0.48) 0.97   44649.5   13000.00
     10     8735.66  152.73    0.394  0.50( 0.49) 0.97   51895.4   11130.00
     11     8218.75  161.54    0.384  0.50( 0.49) 0.97   54591.3   13510.00
     12     6907.22  182.76    0.360  0.50( 0.49) 0.97   60282.6   12400.00
     13     6179.03  193.29    0.355  0.50( 0.49) 0.97   62229.9   13500.00
     14     5423.75  205.68    0.348  0.50( 0.49) 0.97   63895.6   12111.00
     15     4490.64  223.34    0.338  0.50( 0.49) 0.97   65822.5   12261.00
```

```
   16     4018.00  233.87    0.333  0.50( 0.49) 0.97   66634.3   10200.00
   17     3449.46  250.89    0.323  0.50( 0.49) 0.97   67871.7   10300.00
   18     3216.23  258.50    0.319  0.50( 0.49) 0.97   68222.8   12010.00
   19     2730.59  280.94    0.307  0.50( 0.49) 0.97   68552.1   12000.00
   20     1724.83  355.47    0.266  0.50( 0.49) 0.97   69222.3   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       70.25   17.61    1.194  0.50( 0.42) 0.84     101.1   13900.00
 LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    15126.22   17.61    1.194  0.50( 0.47) 0.94    3656.6   13900.00
     2    15146.06   18.69    1.153  0.50( 0.47) 0.94    3875.6   13889.00
     3    15100.03   29.16    0.885  0.50( 0.47) 0.95    6107.9   13810.00
     4    14809.45   45.56    0.695  0.50( 0.48) 0.96   10930.5   10400.00
     5    14362.06   56.92    0.615  0.50( 0.48) 0.97   15211.7   50300.00
     6    13382.00   71.38    0.557  0.50( 0.48) 0.97   21255.6   20400.00
     7    11794.53   94.06    0.485  0.50( 0.48) 0.96   29275.1   11801.00
     8    11180.25  106.21    0.461  0.50( 0.48) 0.96   33276.6   11500.00
     9    10529.87  119.04    0.435  0.50( 0.48) 0.96   37945.4   11000.00
    10     9830.61  134.40    0.416  0.50( 0.48) 0.97   44750.6   13000.00
    11     8741.26  152.73    0.394  0.50( 0.49) 0.97   51996.5   11130.00
    12     8224.21  161.54    0.384  0.50( 0.49) 0.97   54692.4   13510.00
    13     6912.35  182.76    0.360  0.50( 0.49) 0.97   60383.7   12400.00
    14     6184.07  193.29    0.355  0.50( 0.49) 0.97   62331.0   13500.00
    15     5428.69  205.68    0.348  0.50( 0.49) 0.97   63996.7   12111.00
    16     4495.45  223.34    0.338  0.50( 0.49) 0.97   65923.7   12261.00
    17     4022.73  233.87    0.333  0.50( 0.49) 0.97   66735.4   10200.00
    18     3454.06  250.89    0.323  0.50( 0.49) 0.97   67972.8   10300.00
    19     3220.77  258.50    0.319  0.50( 0.49) 0.97   68323.9   12010.00
    20     2734.95  280.94    0.307  0.50( 0.49) 0.97   68653.2   12000.00
    21     1728.62  355.47    0.266  0.50( 0.49) 0.97   69323.4   10100.00
   TOTAL AREA(ACRES) =     69323.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    15146.06  Tc(MIN.) =   18.694
 EFFECTIVE AREA(ACRES) =   3875.65  AREA-AVERAGED Fm(INCH/HR) =  0.47
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.94
 TOTAL AREA(ACRES) =    69323.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13920.00 TO NODE  13921.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    118.00  DOWNSTREAM(FEET) =    115.28
 CHANNEL LENGTH THRU SUBAREA(FEET) =   335.44   CHANNEL SLOPE =  0.0081
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.141
 SUBAREA LOSS RATE DATA(AMC  II):
```



```
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      134.30      0.50      0.658     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.658
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   15195.15
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.84
 AVERAGE FLOW DEPTH(FEET) =  16.85   TRAVEL TIME(MIN.) =   0.31
 Tc(MIN.) =   19.01
 SUBAREA AREA(ACRES) =   134.30       SUBAREA RUNOFF(CFS) =   98.17
 EFFECTIVE AREA(ACRES) =   4009.95     AREA-AVERAGED Fm(INCH/HR) =   0.47
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.93
 TOTAL AREA(ACRES) =    69457.7         PEAK FLOW RATE(CFS) =   15146.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 16.83   FLOW VELOCITY(FEET/SEC.) =  17.82
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13921.00 =  136971.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13921.00 TO NODE  14010.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    115.28  DOWNSTREAM(FEET) =    100.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1396.08   CHANNEL SLOPE =  0.0109
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  20.00
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.099
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       96.27      0.50      0.723     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.723
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   15178.02
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.95
 AVERAGE FLOW DEPTH(FEET) =  15.93   TRAVEL TIME(MIN.) =   1.17
 Tc(MIN.) =   20.17
 SUBAREA AREA(ACRES) =    96.27       SUBAREA RUNOFF(CFS) =   63.90
 EFFECTIVE AREA(ACRES) =   4106.22     AREA-AVERAGED Fm(INCH/HR) =   0.46
 AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.93
 TOTAL AREA(ACRES) =    69554.0         PEAK FLOW RATE(CFS) =   15146.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 15.91   FLOW VELOCITY(FEET/SEC.) =  19.94
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  14010.00 =  138367.47 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    69554.0  TC(MIN.) =     20.17
 EFFECTIVE AREA(ACRES) =   4106.22  AREA-AVERAGED Fm(INCH/HR)=  0.46
 AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.928
 PEAK FLOW RATE(CFS)   =   15146.06

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	15126.22	19.09	1.138	0.50(0.46)	0.93	3887.2	13900.00
2	15146.06	20.17	1.099	0.50(0.46)	0.93	4106.2	13889.00
3	15100.03	30.64	0.861	0.50(0.47)	0.94	6338.4	13810.00
4	14809.45	47.04	0.683	0.50(0.48)	0.95	11161.0	10400.00
5	14362.06	58.42	0.606	0.50(0.48)	0.96	15442.3	50300.00
6	13382.00	72.90	0.552	0.50(0.48)	0.96	21486.1	20400.00
7	11794.53	95.64	0.482	0.50(0.48)	0.96	29505.6	11801.00
8	11180.25	107.80	0.457	0.50(0.48)	0.96	33507.2	11500.00
9	10529.87	120.66	0.432	0.50(0.48)	0.96	38176.0	11000.00
10	9830.61	136.05	0.414	0.50(0.48)	0.96	44981.2	13000.00
11	8741.26	154.43	0.392	0.50(0.48)	0.97	52227.1	11130.00
12	8224.21	163.27	0.382	0.50(0.49)	0.97	54923.0	13510.00
13	6912.35	184.56	0.360	0.50(0.49)	0.97	60614.3	12400.00
14	6184.07	195.14	0.354	0.50(0.49)	0.97	62561.6	13500.00
15	5428.69	207.59	0.347	0.50(0.49)	0.97	64227.3	12111.00
16	4495.45	225.34	0.337	0.50(0.49)	0.97	66154.2	12261.00
17	4022.73	235.93	0.332	0.50(0.49)	0.97	66966.0	10200.00
18	3454.06	253.03	0.322	0.50(0.49)	0.97	68203.4	10300.00
19	3220.77	260.68	0.318	0.50(0.49)	0.97	68554.5	12010.00
20	2734.95	283.21	0.306	0.50(0.49)	0.97	68883.8	12000.00
21	1728.62	358.01	0.265	0.50(0.49)	0.97	69554.0	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S1.DAT
  TIME/DATE OF STUDY: 10:21 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.728
   2)   10.00;  3.040
   3)   15.00;  2.074
   4)   20.00;  1.785
   5)   25.00;  1.539
   6)   30.00;  1.352
   7)   40.00;  1.181
   8)   50.00;  1.062
   9)   60.00;  0.981
  10)   90.00;  0.840
  11)  120.00;  0.769
  12)  180.00;  0.660
  13)  360.00;  0.514
  14) 1440.00;  0.233
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10100.00 TO NODE  10101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   934.06
  ELEVATION DATA: UPSTREAM(FEET) =   3351.52  DOWNSTREAM(FEET) =   3172.56

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.065
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        3.55      0.30     1.000     0   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.64
  TOTAL AREA(ACRES) =      3.55   PEAK FLOW RATE(CFS) =      5.64

**************************************************************************
  FLOW PROCESS FROM NODE  10101.00 TO NODE  10102.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3172.56  DOWNSTREAM(FEET) =   3090.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   942.40   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.47
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.836
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       19.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.97
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   19.11
  SUBAREA AREA(ACRES) =    19.22       SUBAREA RUNOFF(CFS) =   26.58
  EFFECTIVE AREA(ACRES) =     22.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.8          PEAK FLOW RATE(CFS) =      31.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   4.75
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10102.00 =    1876.46 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10102.00 TO NODE  10103.00 IS CODE =  56
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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3090.55  DOWNSTREAM(FEET) =   3022.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   920.65   CHANNEL SLOPE =  0.0740
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.680
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.08
  AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =   3.02
  Tc(MIN.) =   22.13
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   26.73
  EFFECTIVE AREA(ACRES) =     44.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       44.3         PEAK FLOW RATE(CFS) =      55.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   5.46
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10103.00 =    2797.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10103.00 TO NODE  10104.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3022.44  DOWNSTREAM(FEET) =   2962.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.87   CHANNEL SLOPE =  0.0612
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.560
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      126.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     127.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.69
  AVERAGE FLOW DEPTH(FEET) =   1.47   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =   24.56
  SUBAREA AREA(ACRES) =   126.78       SUBAREA RUNOFF(CFS) =  143.82
  EFFECTIVE AREA(ACRES) =    171.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.1         PEAK FLOW RATE(CFS) =     194.07
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.86   FLOW VELOCITY(FEET/SEC.) =   7.62
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10104.00 =    3774.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10104.00 TO NODE  10105.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.57  DOWNSTREAM(FEET) =   2917.85
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.94   CHANNEL SLOPE =  0.0240
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.79
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.358
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.68      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     247.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.88
  AVERAGE FLOW DEPTH(FEET) =   2.73   TRAVEL TIME(MIN.) =   5.28
  Tc(MIN.) =   29.85
  SUBAREA AREA(ACRES) =   112.68       SUBAREA RUNOFF(CFS) =  107.26
  EFFECTIVE AREA(ACRES) =    283.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      283.8         PEAK FLOW RATE(CFS) =     270.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.86   FLOW VELOCITY(FEET/SEC.) =   6.02
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.00 =    5639.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.00 TO NODE  10105.50 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2917.85  DOWNSTREAM(FEET) =   2880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1406.97   CHANNEL SLOPE =  0.0269
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.295
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      183.39      0.30     1.000     -
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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     352.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.76
  AVERAGE FLOW DEPTH(FEET) =   3.18   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   33.32
  SUBAREA AREA(ACRES) =   183.39       SUBAREA RUNOFF(CFS) =  164.28
  EFFECTIVE AREA(ACRES) =    467.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      467.1          PEAK FLOW RATE(CFS) =     418.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.48   FLOW VELOCITY(FEET/SEC.) =   7.10
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.50 =    7046.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.50 TO NODE  10106.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2880.00  DOWNSTREAM(FEET) =   2868.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1701.11   CHANNEL SLOPE =  0.0070
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.03
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.185
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     442.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.40
  AVERAGE FLOW DEPTH(FEET) =   5.02   TRAVEL TIME(MIN.) =   6.44
  Tc(MIN.) =   39.76
  SUBAREA AREA(ACRES) =    60.63       SUBAREA RUNOFF(CFS) =   48.30
  EFFECTIVE AREA(ACRES) =    527.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      527.8          PEAK FLOW RATE(CFS) =     420.47
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.89   FLOW VELOCITY(FEET/SEC.) =   4.34
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10106.00 =    8748.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10106.00 TO NODE  10107.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   2868.10  DOWNSTREAM(FEET) =   2781.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2951.00   CHANNEL SLOPE =  0.0294
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.61
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.106
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     465.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.55
  AVERAGE FLOW DEPTH(FEET) =   3.59   TRAVEL TIME(MIN.) =   6.52
  Tc(MIN.) =   46.28
  SUBAREA AREA(ACRES) =   123.11       SUBAREA RUNOFF(CFS) =   89.35
  EFFECTIVE AREA(ACRES) =    650.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.9          PEAK FLOW RATE(CFS) =     472.37
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.62   FLOW VELOCITY(FEET/SEC.) =   7.57
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10107.00 =   11699.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10107.00 TO NODE  10108.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2781.28  DOWNSTREAM(FEET) =   2725.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2630.56   CHANNEL SLOPE =  0.0213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.20
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.041
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      186.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     534.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.97
  AVERAGE FLOW DEPTH(FEET) =   4.18   TRAVEL TIME(MIN.) =   6.29
  Tc(MIN.) =   52.57
  SUBAREA AREA(ACRES) =   186.62       SUBAREA RUNOFF(CFS) =  124.51
  EFFECTIVE AREA(ACRES) =    837.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      837.5          PEAK FLOW RATE(CFS) =     558.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.28
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.28   FLOW VELOCITY(FEET/SEC.) =   7.05
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10108.00 =   14329.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10108.00 TO NODE  10109.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2725.20  DOWNSTREAM(FEET) =   2581.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2890.52   CHANNEL SLOPE =  0.0496
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.57
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.001
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     594.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.76
  AVERAGE FLOW DEPTH(FEET) =   3.56   TRAVEL TIME(MIN.) =   4.94
  Tc(MIN.) =   57.50
  SUBAREA AREA(ACRES) =   112.07       SUBAREA RUNOFF(CFS) =   70.73
  EFFECTIVE AREA(ACRES) =    949.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      949.6         PEAK FLOW RATE(CFS) =     599.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.57   FLOW VELOCITY(FEET/SEC.) =   9.78
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10109.00 =   17220.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10109.00 TO NODE  10110.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.72  DOWNSTREAM(FEET) =   2367.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2877.15   CHANNEL SLOPE =  0.0744
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.973
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     643.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.55
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  AVERAGE FLOW DEPTH(FEET) =   3.34   TRAVEL TIME(MIN.) =   4.15
  Tc(MIN.) =   61.65
  SUBAREA AREA(ACRES) =   145.21       SUBAREA RUNOFF(CFS) =   87.99
  EFFECTIVE AREA(ACRES) =   1094.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1094.8         PEAK FLOW RATE(CFS) =     663.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.39   FLOW VELOCITY(FEET/SEC.) =  11.65
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10110.00 =   20097.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10110.00 TO NODE  10111.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2367.59  DOWNSTREAM(FEET) =   2075.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2802.04   CHANNEL SLOPE =  0.1041
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.35
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.957
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     763.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.67
  AVERAGE FLOW DEPTH(FEET) =   3.35   TRAVEL TIME(MIN.) =   3.42
  Tc(MIN.) =   65.07
  SUBAREA AREA(ACRES) =   339.01       SUBAREA RUNOFF(CFS) =  200.53
  EFFECTIVE AREA(ACRES) =   1433.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1433.8         PEAK FLOW RATE(CFS) =     848.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.53   FLOW VELOCITY(FEET/SEC.) =  14.09
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10111.00 =   22899.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10111.00 TO NODE  10112.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2075.82  DOWNSTREAM(FEET) =   2004.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3782.59   CHANNEL SLOPE =  0.0190
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.64
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.919
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      265.32      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     922.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.71
  AVERAGE FLOW DEPTH(FEET) =   5.63   TRAVEL TIME(MIN.) =   8.17
  Tc(MIN.) =   73.25
  SUBAREA AREA(ACRES) =   265.32       SUBAREA RUNOFF(CFS) =  147.77
  EFFECTIVE AREA(ACRES) =   1699.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1699.1         PEAK FLOW RATE(CFS) =     946.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.70   FLOW VELOCITY(FEET/SEC.) =   7.77
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.00 =   26681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10112.00 TO NODE  10112.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.03  DOWNSTREAM(FEET) =   1982.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1479.53   CHANNEL SLOPE =  0.0149
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.903
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      307.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1029.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.25
  AVERAGE FLOW DEPTH(FEET) =   6.29   TRAVEL TIME(MIN.) =   3.40
  Tc(MIN.) =   76.65
  SUBAREA AREA(ACRES) =   307.63       SUBAREA RUNOFF(CFS) =  166.90
  EFFECTIVE AREA(ACRES) =   2006.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.7         PEAK FLOW RATE(CFS) =    1088.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.46   FLOW VELOCITY(FEET/SEC.) =   7.36
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.50 =   28161.39 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1982.04  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3416.13   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.868
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1121.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.70
  AVERAGE FLOW DEPTH(FEET) =   6.39   TRAVEL TIME(MIN.) =   7.39
  Tc(MIN.) =   84.04
  SUBAREA AREA(ACRES) =   127.40       SUBAREA RUNOFF(CFS) =   65.14
  EFFECTIVE AREA(ACRES) =   2134.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2134.1         PEAK FLOW RATE(CFS) =    1091.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.31   FLOW VELOCITY(FEET/SEC.) =   7.65
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     2134.1  TC(MIN.) =     84.04
  EFFECTIVE AREA(ACRES) =   2134.14  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1091.15
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S2.DAT
  TIME/DATE OF STUDY: 10:21 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.743
   2)   10.00;  3.049
   3)   15.00;  2.077
   4)   20.00;  1.789
   5)   25.00;  1.541
   6)   30.00;  1.354
   7)   40.00;  1.183
   8)   50.00;  1.063
   9)   60.00;  0.983
  10)   90.00;  0.843
  11)  120.00;  0.772
  12)  180.00;  0.662
  13)  360.00;  0.516
  14) 1440.00;  0.234
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10200.00 TO NODE  10201.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   301.66
  ELEVATION DATA: UPSTREAM(FEET) =   3087.44  DOWNSTREAM(FEET) =   3031.53

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.149
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.09      0.30     1.000     0    9.71
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.79
  TOTAL AREA(ACRES) =      1.09   PEAK FLOW RATE(CFS) =      2.79

************************************************************************
  FLOW PROCESS FROM NODE  10201.00 TO NODE  10202.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3031.53  DOWNSTREAM(FEET) =   2903.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   538.03   CHANNEL SLOPE =  0.2382
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.20
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.649
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.81
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   2.35
  Tc(MIN.) =   12.06
  SUBAREA AREA(ACRES) =     4.06       SUBAREA RUNOFF(CFS) =    8.58
  EFFECTIVE AREA(ACRES) =      5.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2          PEAK FLOW RATE(CFS) =      10.89
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   4.45
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10202.00 =     839.69 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10202.00 TO NODE  10203.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.38  DOWNSTREAM(FEET) =   2639.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1124.98   CHANNEL SLOPE =  0.2344
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.141
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.17
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   2.61
  Tc(MIN.) =   14.67
  SUBAREA AREA(ACRES) =    36.13       SUBAREA RUNOFF(CFS) =   59.85
  EFFECTIVE AREA(ACRES) =     41.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.3         PEAK FLOW RATE(CFS) =      68.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   8.58
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10203.00 =    1964.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10203.00 TO NODE  10204.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2639.65  DOWNSTREAM(FEET) =   2444.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.75   CHANNEL SLOPE =  0.1026
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.856
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     107.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.58
  AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   4.17
  Tc(MIN.) =   18.84
  SUBAREA AREA(ACRES) =    56.14       SUBAREA RUNOFF(CFS) =   78.60
  EFFECTIVE AREA(ACRES) =     97.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =     136.40
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   8.20
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10204.00 =    3862.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10204.00 TO NODE  10205.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2444.90  DOWNSTREAM(FEET) =   2245.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1973.02   CHANNEL SLOPE =  0.1010
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.13
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.689
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      264.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     302.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.37
  AVERAGE FLOW DEPTH(FEET) =   2.06   TRAVEL TIME(MIN.) =   3.17
  Tc(MIN.) =   22.02
  SUBAREA AREA(ACRES) =   264.47       SUBAREA RUNOFF(CFS) =  330.64
  EFFECTIVE AREA(ACRES) =    361.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      361.9         PEAK FLOW RATE(CFS) =     452.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.56   FLOW VELOCITY(FEET/SEC.) =  11.68
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10205.00 =    5835.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10205.00 TO NODE  10206.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2245.64  DOWNSTREAM(FEET) =   2157.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1870.92   CHANNEL SLOPE =  0.0469
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.67
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.531
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      255.55      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     594.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.55
  AVERAGE FLOW DEPTH(FEET) =   3.61   TRAVEL TIME(MIN.) =   3.26
  Tc(MIN.) =   25.28
  SUBAREA AREA(ACRES) =   255.55       SUBAREA RUNOFF(CFS) =  283.03
  EFFECTIVE AREA(ACRES) =    617.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      617.4          PEAK FLOW RATE(CFS) =     683.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.88   FLOW VELOCITY(FEET/SEC.) =   9.93
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.00 =    7706.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.00 TO NODE  10206.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2157.91  DOWNSTREAM(FEET) =   2119.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1453.59   CHANNEL SLOPE =  0.0266
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.72
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.421
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     755.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.28
  AVERAGE FLOW DEPTH(FEET) =   4.70   TRAVEL TIME(MIN.) =   2.93
  Tc(MIN.) =   28.21
  SUBAREA AREA(ACRES) =   141.47       SUBAREA RUNOFF(CFS) =  142.74
  EFFECTIVE AREA(ACRES) =    758.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      758.9          PEAK FLOW RATE(CFS) =     765.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.73   FLOW VELOCITY(FEET/SEC.) =   8.31
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.50 =    9159.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   2119.30  DOWNSTREAM(FEET) =   2093.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2020.48   CHANNEL SLOPE =  0.0129
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.296
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     812.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.47
  AVERAGE FLOW DEPTH(FEET) =   5.81   TRAVEL TIME(MIN.) =   5.20
  Tc(MIN.) =   33.41
  SUBAREA AREA(ACRES) =   105.39       SUBAREA RUNOFF(CFS) =   94.45
  EFFECTIVE AREA(ACRES) =    864.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      864.3          PEAK FLOW RATE(CFS) =     774.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.68   FLOW VELOCITY(FEET/SEC.) =   6.39
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10220.00 =   11180.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.41
  RAINFALL INTENSITY(INCH/HR) =   1.30
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     864.30
  TOTAL STREAM AREA(ACRES) =     864.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     774.54

****************************************************************************
  FLOW PROCESS FROM NODE  10210.00 TO NODE  10211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   890.82
  ELEVATION DATA: UPSTREAM(FEET) =   2966.08  DOWNSTREAM(FEET) =   2867.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.601
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.985
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -       7.25      0.30      1.000     0   16.60
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.99
  TOTAL AREA(ACRES) =      7.25   PEAK FLOW RATE(CFS) =     10.99

****************************************************************************
  FLOW PROCESS FROM NODE  10211.00 TO NODE  10212.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2867.74  DOWNSTREAM(FEET) =   2763.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1682.06   CHANNEL SLOPE =  0.0618
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.627
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       33.02      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.21
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   6.66
  Tc(MIN.) =   23.26
  SUBAREA AREA(ACRES) =    33.02       SUBAREA RUNOFF(CFS) =   39.45
  EFFECTIVE AREA(ACRES) =     40.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.3         PEAK FLOW RATE(CFS) =      48.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) =   4.93
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10212.00 =    2572.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10212.00 TO NODE  10213.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2763.75  DOWNSTREAM(FEET) =   2662.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1206.59   CHANNEL SLOPE =  0.0842
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.492
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       71.89      0.30      1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      86.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.62
  AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   26.30
  SUBAREA AREA(ACRES) =    71.89       SUBAREA RUNOFF(CFS) =   77.16
  EFFECTIVE AREA(ACRES) =    112.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      112.2          PEAK FLOW RATE(CFS) =     120.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =   7.35
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10213.00 =    3779.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10213.00 TO NODE  10214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2662.20  DOWNSTREAM(FEET) =   2520.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1783.17   CHANNEL SLOPE =  0.0793
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.84
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.362
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      182.61      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     207.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.51
  AVERAGE FLOW DEPTH(FEET) =   1.80   TRAVEL TIME(MIN.) =   3.49
  Tc(MIN.) =   29.79
  SUBAREA AREA(ACRES) =   182.61       SUBAREA RUNOFF(CFS) =  174.53
  EFFECTIVE AREA(ACRES) =    294.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      294.8          PEAK FLOW RATE(CFS) =     281.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.12   FLOW VELOCITY(FEET/SEC.) =   9.34
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10214.00 =    5562.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10214.00 TO NODE  10215.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   2520.73  DOWNSTREAM(FEET) =   2270.71
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2774.20   CHANNEL SLOPE =  0.0901
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.282
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      156.94      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     351.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.41
 AVERAGE FLOW DEPTH(FEET) =   2.31   TRAVEL TIME(MIN.) =   4.44
 Tc(MIN.) =   34.23
 SUBAREA AREA(ACRES) =   156.94       SUBAREA RUNOFF(CFS) =  138.67
 EFFECTIVE AREA(ACRES) =    451.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      451.7         PEAK FLOW RATE(CFS) =     399.12
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.47   FLOW VELOCITY(FEET/SEC.) =  10.82
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10215.00 =    8336.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10215.00 TO NODE  10216.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2270.71  DOWNSTREAM(FEET) =   2151.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.75   CHANNEL SLOPE =  0.0592
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.96
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.222
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      130.62      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     453.33
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.64
 AVERAGE FLOW DEPTH(FEET) =   2.96   TRAVEL TIME(MIN.) =   3.49
 Tc(MIN.) =   37.72
 SUBAREA AREA(ACRES) =   130.62       SUBAREA RUNOFF(CFS) =  108.39
 EFFECTIVE AREA(ACRES) =    582.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      582.3         PEAK FLOW RATE(CFS) =     483.24
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.05
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.05   FLOW VELOCITY(FEET/SEC.) =   9.82
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.00 =   10356.59 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10216.00 TO NODE  10216.50 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2151.20  DOWNSTREAM(FEET) =   2120.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1242.42   CHANNEL SLOPE =  0.0246
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.92
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.176
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       51.25      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     503.44
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.22
 AVERAGE FLOW DEPTH(FEET) =   3.91   TRAVEL TIME(MIN.) =   2.87
 Tc(MIN.) =   40.59
 SUBAREA AREA(ACRES) =    51.25       SUBAREA RUNOFF(CFS) =   40.41
 EFFECTIVE AREA(ACRES) =    633.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      633.6         PEAK FLOW RATE(CFS) =     499.52
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.90

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.90   FLOW VELOCITY(FEET/SEC.) =   7.21
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.50 =   11599.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2120.63  DOWNSTREAM(FEET) =   2093.25
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1301.06   CHANNEL SLOPE =  0.0210
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.09
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.138
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       26.16      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     509.39
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.85
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  AVERAGE FLOW DEPTH(FEET) =   4.09   TRAVEL TIME(MIN.) =   3.17
  Tc(MIN.) =   43.76
  SUBAREA AREA(ACRES) =    26.16       SUBAREA RUNOFF(CFS) =   19.73
  EFFECTIVE AREA(ACRES) =    659.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      659.7         PEAK FLOW RATE(CFS) =     499.52
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.05   FLOW VELOCITY(FEET/SEC.) =   6.80
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   43.76
  RAINFALL INTENSITY(INCH/HR) =   1.14
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     659.74
  TOTAL STREAM AREA(ACRES) =     659.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     499.52

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      774.54   33.41    1.296  0.30( 0.30) 1.00     864.3   10200.00
      2      499.52   43.76    1.138  0.30( 0.30) 1.00     659.7   10210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1227.77   33.41    1.296  0.30( 0.30) 1.00    1368.1   10200.00
      2     1151.38   43.76    1.138  0.30( 0.30) 1.00    1524.0   10210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1227.77    Tc(MIN.) =    33.41
  EFFECTIVE AREA(ACRES) =    1368.08   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1524.0
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10220.00 TO NODE  10221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2093.25  DOWNSTREAM(FEET) =   1965.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2966.11   CHANNEL SLOPE =  0.0430
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.221
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      104.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1271.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.34
  AVERAGE FLOW DEPTH(FEET) =   5.39   TRAVEL TIME(MIN.) =   4.36
  Tc(MIN.) =   37.77
  SUBAREA AREA(ACRES) =   104.45       SUBAREA RUNOFF(CFS) =   86.60
  EFFECTIVE AREA(ACRES) =   1472.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1628.5         PEAK FLOW RATE(CFS) =    1227.77
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.30   FLOW VELOCITY(FEET/SEC.) =  11.25
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.00 =   15866.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.00 TO NODE  10221.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1965.76  DOWNSTREAM(FEET) =   1950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1346.48   CHANNEL SLOPE =  0.0117
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.42
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.172
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      169.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1294.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.04
  AVERAGE FLOW DEPTH(FEET) =   7.41   TRAVEL TIME(MIN.) =   3.19
  Tc(MIN.) =   40.96
  SUBAREA AREA(ACRES) =   169.50       SUBAREA RUNOFF(CFS) =  132.96
  EFFECTIVE AREA(ACRES) =   1642.03     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1798.0         PEAK FLOW RATE(CFS) =    1288.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.39   FLOW VELOCITY(FEET/SEC.) =   7.03
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.50 =   17212.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1950.00  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1849.80   CHANNEL SLOPE =  0.0131
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.25
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.121
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1304.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.35
  AVERAGE FLOW DEPTH(FEET) =   7.24   TRAVEL TIME(MIN.) =   4.19
  Tc(MIN.) =   45.15
  SUBAREA AREA(ACRES) =    43.12       SUBAREA RUNOFF(CFS) =   31.87
  EFFECTIVE AREA(ACRES) =   1685.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1841.1         PEAK FLOW RATE(CFS) =    1288.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.20   FLOW VELOCITY(FEET/SEC.) =   7.33
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1841.1  TC(MIN.) =     45.15
  EFFECTIVE AREA(ACRES) =   1685.15  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1288.08

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1288.08   45.15    1.121  0.30( 0.30) 1.00    1685.2   10200.00
      2     1216.25   55.69    1.018  0.30( 0.30) 1.00    1841.1   10210.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S3.DAT
  TIME/DATE OF STUDY: 10:21 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.756
   2)   10.00;  3.056
   3)   15.00;  2.080
   4)   20.00;  1.791
   5)   25.00;  1.543
   6)   30.00;  1.355
   7)   40.00;  1.185
   8)   50.00;  1.065
   9)   60.00;  0.984
  10)   90.00;  0.844
  11)  120.00;  0.773
  12)  180.00;  0.664
  13)  360.00;  0.517
  14) 1440.00;  0.235
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10300.00 TO NODE  10301.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.52
  ELEVATION DATA: UPSTREAM(FEET) =   4227.21  DOWNSTREAM(FEET) =   4064.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.977
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.744
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.00      0.30     1.000     0    7.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.10
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      3.10

************************************************************************
  FLOW PROCESS FROM NODE  10301.00 TO NODE  10302.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4064.64  DOWNSTREAM(FEET) =   3797.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =   631.34   CHANNEL SLOPE =  0.4235
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.062
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.23      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.24
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =    9.98
  SUBAREA AREA(ACRES) =     6.23       SUBAREA RUNOFF(CFS) =   15.48
  EFFECTIVE AREA(ACRES) =      7.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2          PEAK FLOW RATE(CFS) =      17.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   6.46
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10302.00 =     941.86 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10302.00 TO NODE  10303.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3797.25  DOWNSTREAM(FEET) =   3447.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1908.89   CHANNEL SLOPE =  0.1834
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.69
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.165
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.94
  AVERAGE FLOW DEPTH(FEET) =   0.60   TRAVEL TIME(MIN.) =   4.58
  Tc(MIN.) =   14.57
  SUBAREA AREA(ACRES) =    32.83       SUBAREA RUNOFF(CFS) =   55.10
  EFFECTIVE AREA(ACRES) =     40.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =      67.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   7.88
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10303.00 =    2850.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10303.00 TO NODE  10304.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3447.07  DOWNSTREAM(FEET) =   3228.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.05   CHANNEL SLOPE =  0.1140
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.872
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     110.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.92
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   18.60
  SUBAREA AREA(ACRES) =    60.51       SUBAREA RUNOFF(CFS) =   85.60
  EFFECTIVE AREA(ACRES) =    100.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.6         PEAK FLOW RATE(CFS) =     142.28
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   8.61
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10304.00 =    4768.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10304.00 TO NODE  10305.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3228.48  DOWNSTREAM(FEET) =   3118.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1679.40   CHANNEL SLOPE =  0.0656
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.97
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.688
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     215.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.06
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   22.07
  SUBAREA AREA(ACRES) =   116.56       SUBAREA RUNOFF(CFS) =  145.62
  EFFECTIVE AREA(ACRES) =    217.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      217.1         PEAK FLOW RATE(CFS) =     271.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.19   FLOW VELOCITY(FEET/SEC.) =   8.63
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10305.00 =    6448.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10305.00 TO NODE  10306.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3118.37  DOWNSTREAM(FEET) =   2807.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2853.67   CHANNEL SLOPE =  0.1088
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.495
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      189.23      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     373.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.35
  AVERAGE FLOW DEPTH(FEET) =   2.26   TRAVEL TIME(MIN.) =   4.19
  Tc(MIN.) =   26.26
  SUBAREA AREA(ACRES) =   189.23       SUBAREA RUNOFF(CFS) =  203.61
  EFFECTIVE AREA(ACRES) =    406.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      406.4          PEAK FLOW RATE(CFS) =     437.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.47   FLOW VELOCITY(FEET/SEC.) =  11.87
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10306.00 =    9301.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10306.00 TO NODE  10307.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2807.99  DOWNSTREAM(FEET) =   2591.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2848.03   CHANNEL SLOPE =  0.0759
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.349
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      416.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     634.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.58
  AVERAGE FLOW DEPTH(FEET) =   3.30   TRAVEL TIME(MIN.) =   4.10
  Tc(MIN.) =   30.36
  SUBAREA AREA(ACRES) =   416.51       SUBAREA RUNOFF(CFS) =  393.19
  EFFECTIVE AREA(ACRES) =    822.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      822.9          PEAK FLOW RATE(CFS) =     776.80
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.66   FLOW VELOCITY(FEET/SEC.) =  12.26
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10307.00 =   12149.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10307.00 TO NODE  10308.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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```
  ELEVATION DATA: UPSTREAM(FEET) =   2591.87  DOWNSTREAM(FEET) =   2516.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.06   CHANNEL SLOPE =  0.0263
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.21
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.255
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.49      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     915.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.68
  AVERAGE FLOW DEPTH(FEET) =   5.18   TRAVEL TIME(MIN.) =   5.49
  Tc(MIN.) =   35.86
  SUBAREA AREA(ACRES) =   320.49       SUBAREA RUNOFF(CFS) =  276.83
  EFFECTIVE AREA(ACRES) =   1143.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1143.4          PEAK FLOW RATE(CFS) =     984.47
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.37   FLOW VELOCITY(FEET/SEC.) =   8.85
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.00 =   15011.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.00 TO NODE  10308.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2516.62  DOWNSTREAM(FEET) =   2462.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.32   CHANNEL SLOPE =  0.0288
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.46
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.198
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.88      0.30     0.966     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.966
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1062.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.33
  AVERAGE FLOW DEPTH(FEET) =   5.45   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   39.23
  SUBAREA AREA(ACRES) =   191.88       SUBAREA RUNOFF(CFS) =  156.87
  EFFECTIVE AREA(ACRES) =   1335.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1335.2          PEAK FLOW RATE(CFS) =    1082.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.50
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.50   FLOW VELOCITY(FEET/SEC.) =   9.38
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.50 =   16901.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.50 TO NODE  10309.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.25  DOWNSTREAM(FEET) =   2409.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1874.33   CHANNEL SLOPE =  0.0279
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.63
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.154
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1116.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.36
  AVERAGE FLOW DEPTH(FEET) =   5.62   TRAVEL TIME(MIN.) =   3.34
  Tc(MIN.) =   42.57
  SUBAREA AREA(ACRES) =    90.14       SUBAREA RUNOFF(CFS) =   69.30
  EFFECTIVE AREA(ACRES) =   1425.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1425.4         PEAK FLOW RATE(CFS) =    1098.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.57   FLOW VELOCITY(FEET/SEC.) =   9.32
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10309.00 =   18775.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2409.87  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2576.20   CHANNEL SLOPE =  0.0310
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.52
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.101
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1129.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.74
```



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  AVERAGE FLOW DEPTH(FEET) =   5.51   TRAVEL TIME(MIN.) =   4.41
  Tc(MIN.) =   46.97
  SUBAREA AREA(ACRES) =    83.83       SUBAREA RUNOFF(CFS) =   60.46
  EFFECTIVE AREA(ACRES) =   1509.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1509.2         PEAK FLOW RATE(CFS) =    1098.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.44   FLOW VELOCITY(FEET/SEC.) =   9.68
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   46.97
  RAINFALL INTENSITY(INCH/HR) =   1.10
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =    1509.21
  TOTAL STREAM AREA(ACRES) =    1509.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1098.84

****************************************************************************
  FLOW PROCESS FROM NODE  10320.00 TO NODE  10321.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.56
  ELEVATION DATA: UPSTREAM(FEET) =   3374.80  DOWNSTREAM(FEET) =   3300.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.959
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.410
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.24      0.30     1.000     0    8.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.27
  TOTAL AREA(ACRES) =      2.24   PEAK FLOW RATE(CFS) =      6.27

****************************************************************************
  FLOW PROCESS FROM NODE  10321.00 TO NODE  10322.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

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================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3300.24  DOWNSTREAM(FEET) =   3187.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   581.07   CHANNEL SLOPE =  0.1945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.821
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.31
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =   11.20
  SUBAREA AREA(ACRES) =     5.01       SUBAREA RUNOFF(CFS) =   11.37
  EFFECTIVE AREA(ACRES) =      7.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2         PEAK FLOW RATE(CFS) =      16.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   4.87
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10322.00 =     871.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10322.00 TO NODE  10323.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3187.21  DOWNSTREAM(FEET) =   3108.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.98   CHANNEL SLOPE =  0.0801
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.203
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.15
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   3.16
  Tc(MIN.) =   14.37
  SUBAREA AREA(ACRES) =    30.37       SUBAREA RUNOFF(CFS) =   52.02
  EFFECTIVE AREA(ACRES) =     37.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =      64.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.92
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.92   FLOW VELOCITY(FEET/SEC.) =   5.91
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10323.00 =    1849.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10323.00 TO NODE  10324.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3108.86  DOWNSTREAM(FEET) =   2923.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.11   CHANNEL SLOPE =  0.0966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.27
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.871
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     113.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.55
  AVERAGE FLOW DEPTH(FEET) =   1.21   TRAVEL TIME(MIN.) =   4.25
  Tc(MIN.) =   18.61
  SUBAREA AREA(ACRES) =    68.88       SUBAREA RUNOFF(CFS) =   97.40
  EFFECTIVE AREA(ACRES) =    106.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.5         PEAK FLOW RATE(CFS) =     150.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =   8.29
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10324.00 =    3773.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10324.00 TO NODE  10325.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2923.03  DOWNSTREAM(FEET) =   2675.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2788.58   CHANNEL SLOPE =  0.0889
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.94
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.611
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      146.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     237.12
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.25
  AVERAGE FLOW DEPTH(FEET) =   1.87   TRAVEL TIME(MIN.) =   5.02
  Tc(MIN.) =   23.64
  SUBAREA AREA(ACRES) =   146.19       SUBAREA RUNOFF(CFS) =  172.44
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =     298.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.12   FLOW VELOCITY(FEET/SEC.) =   9.88
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10325.00 =    6562.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10325.00 TO NODE  10326.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2675.11  DOWNSTREAM(FEET) =   2541.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.28   CHANNEL SLOPE =  0.0465
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.27
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.392
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      321.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     456.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.87
  AVERAGE FLOW DEPTH(FEET) =   3.16   TRAVEL TIME(MIN.) =   5.38
  Tc(MIN.) =   29.01
  SUBAREA AREA(ACRES) =   321.78       SUBAREA RUNOFF(CFS) =  316.29
  EFFECTIVE AREA(ACRES) =    574.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      574.5         PEAK FLOW RATE(CFS) =     564.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.52   FLOW VELOCITY(FEET/SEC.) =   9.41
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.00 =    9424.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10326.00 TO NODE  10326.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2541.92  DOWNSTREAM(FEET) =   2438.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2617.40   CHANNEL SLOPE =  0.0394
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```



```
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.97
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.291
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      187.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     648.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.18
  AVERAGE FLOW DEPTH(FEET) =   3.95   TRAVEL TIME(MIN.) =   4.75
  Tc(MIN.) =   33.77
  SUBAREA AREA(ACRES) =   187.06       SUBAREA RUNOFF(CFS) =  166.84
  EFFECTIVE AREA(ACRES) =    761.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      761.5         PEAK FLOW RATE(CFS) =     679.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.04   FLOW VELOCITY(FEET/SEC.) =   9.30
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.50 =   12041.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10326.50 TO NODE  10327.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2438.80  DOWNSTREAM(FEET) =   2414.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1181.79   CHANNEL SLOPE =  0.0204
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.89
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.246
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     714.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.41
  AVERAGE FLOW DEPTH(FEET) =   4.88   TRAVEL TIME(MIN.) =   2.66
  Tc(MIN.) =   36.43
  SUBAREA AREA(ACRES) =    82.27       SUBAREA RUNOFF(CFS) =   70.03
  EFFECTIVE AREA(ACRES) =    843.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      843.8         PEAK FLOW RATE(CFS) =     718.28
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.89   FLOW VELOCITY(FEET/SEC.) =   7.42
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.00 =   13223.77 FEET.
```

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****************************************************************************
  FLOW PROCESS FROM NODE  10327.00 TO NODE  10327.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2414.64  DOWNSTREAM(FEET) =   2389.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2431.92   CHANNEL SLOPE =  0.0102
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.17
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.146
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      243.69      0.30     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     811.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.94
  AVERAGE FLOW DEPTH(FEET) =   6.13   TRAVEL TIME(MIN.) =   6.82
  Tc(MIN.) =   43.25
  SUBAREA AREA(ACRES) =   243.69       SUBAREA RUNOFF(CFS) =  185.77
  EFFECTIVE AREA(ACRES) =   1087.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1087.5         PEAK FLOW RATE(CFS) =     828.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.19   FLOW VELOCITY(FEET/SEC.) =   5.98
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.50 =   15655.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2389.73  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.59   CHANNEL SLOPE =  0.0306
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.82
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.103
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     853.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.02
  AVERAGE FLOW DEPTH(FEET) =   4.82   TRAVEL TIME(MIN.) =   3.59
  Tc(MIN.) =   46.84
  SUBAREA AREA(ACRES) =    69.36       SUBAREA RUNOFF(CFS) =   50.13
```



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  EFFECTIVE AREA(ACRES) =   1156.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1156.8         PEAK FLOW RATE(CFS) =     836.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.77   FLOW VELOCITY(FEET/SEC.) =   8.97
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10330.00 =   17600.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   46.84
  RAINFALL INTENSITY(INCH/HR) =   1.10
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1156.85
  TOTAL STREAM AREA(ACRES) =    1156.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     836.24

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1098.84   46.97    1.101  0.30( 0.30) 0.99    1509.2   10300.00
      2      836.24   46.84    1.103  0.30( 0.30) 1.00    1156.8   10320.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1934.13   46.84    1.103  0.30( 0.30) 1.00    2661.7   10320.00
      2     1933.40   46.97    1.101  0.30( 0.30) 1.00    2666.1   10300.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1934.13    Tc(MIN.) =    46.84
  EFFECTIVE AREA(ACRES) =    2661.74   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2666.1
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10330.00 TO NODE  10331.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2330.13  DOWNSTREAM(FEET) =   2041.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3034.53   CHANNEL SLOPE =  0.0951
```

```
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.49
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.067
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       70.23      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1958.38
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.04
 AVERAGE FLOW DEPTH(FEET) =   5.48   TRAVEL TIME(MIN.) =   2.97
 Tc(MIN.) =   49.81
 SUBAREA AREA(ACRES) =    70.23       SUBAREA RUNOFF(CFS) =   48.50
 EFFECTIVE AREA(ACRES) =   2731.97     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2736.3         PEAK FLOW RATE(CFS) =    1934.13
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.45

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.45   FLOW VELOCITY(FEET/SEC.) =  16.98
 LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10331.00 =   24386.34 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2041.66  DOWNSTREAM(FEET) =   1739.96
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3264.87   CHANNEL SLOPE =  0.0924
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.54
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.040
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      104.94      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1969.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.88
 AVERAGE FLOW DEPTH(FEET) =   5.54   TRAVEL TIME(MIN.) =   3.22
 Tc(MIN.) =   53.03
 SUBAREA AREA(ACRES) =   104.94       SUBAREA RUNOFF(CFS) =   69.94
 EFFECTIVE AREA(ACRES) =   2836.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2841.2         PEAK FLOW RATE(CFS) =    1934.13
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.49
```



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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.49   FLOW VELOCITY(FEET/SEC.) =  16.80
 LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S1.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1091.15   84.04  0.30( 0.30) 1.00    2134.1   10100.00
   TOTAL AREA(ACRES) =     2134.1

****************************************************************************
 FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S2.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1288.08   45.15  0.30( 0.30) 1.00    1685.2   10200.00
     2     1216.25   55.69  0.30( 0.30) 1.00    1841.1   10210.00
   TOTAL AREA(ACRES) =     1841.1

****************************************************************************
 FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1288.08   45.15  0.30( 0.30) 1.00    1685.2   10200.00
     2     1216.25   55.69  0.30( 0.30) 1.00    1841.1   10210.00
   TOTAL AREA(ACRES) =      1841.1

****************************************************************************
 FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1288.08   45.15    1.123  0.30( 0.30) 1.00    1685.2   10200.00
```

```
    2     1216.25   55.69    1.019  0.30( 0.30) 1.00    1841.1   10210.00
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1091.15   84.04    0.872  0.30( 0.30) 1.00    2134.1   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     2131.98   45.15    1.123  0.30( 0.30) 1.00    2831.7   10200.00
    2     2125.28   55.69    1.019  0.30( 0.30) 1.00    3255.3   10210.00
    3     2058.55   84.04    0.872  0.30( 0.30) 1.00    3975.2   10100.00
   TOTAL AREA(ACRES) =      3975.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     2131.98  Tc(MIN.) =   45.148
 EFFECTIVE AREA(ACRES) =   2831.69  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3975.2
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10222.00 TO NODE  10332.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1925.82  DOWNSTREAM(FEET) =   1739.96
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1475.92   CHANNEL SLOPE =  0.1259
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.35
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.108
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       19.92      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2139.22
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.34
 AVERAGE FLOW DEPTH(FEET) =   5.35   TRAVEL TIME(MIN.) =   1.27
 Tc(MIN.) =   46.42
 SUBAREA AREA(ACRES) =    19.92       SUBAREA RUNOFF(CFS) =   14.49
 EFFECTIVE AREA(ACRES) =   2851.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3995.2          PEAK FLOW RATE(CFS) =    2131.98
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.34

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.34   FLOW VELOCITY(FEET/SEC.) =  19.32
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.
```



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****************************************************************************
 FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     2131.98   46.42    1.108  0.30( 0.30) 1.00    2851.6   10200.00
    2     2125.28   56.96    1.009  0.30( 0.30) 1.00    3275.2   10210.00
    3     2058.55   85.32    0.866  0.30( 0.30) 1.00    3995.2   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1934.13   53.03    1.040  0.30( 0.30) 1.00    2836.9   10320.00
    2     1933.40   53.17    1.039  0.30( 0.30) 1.00    2841.2   10300.00
 LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3979.07   46.42    1.108  0.30( 0.30) 1.00    5334.8   10200.00
    2     4061.91   53.03    1.040  0.30( 0.30) 1.00    5954.2   10320.00
    3     4061.09   53.17    1.039  0.30( 0.30) 1.00    5964.1   10300.00
    4     3978.51   56.96    1.009  0.30( 0.30) 1.00    6116.4   10210.00
    5     3539.03   85.32    0.866  0.30( 0.30) 1.00    6836.4   10100.00
   TOTAL AREA(ACRES) =      6836.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     4061.91  Tc(MIN.) =   53.032
 EFFECTIVE AREA(ACRES) =   5954.24  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     6836.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     6836.4  TC(MIN.) =     53.03
 EFFECTIVE AREA(ACRES) =   5954.24  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.998
 PEAK FLOW RATE(CFS)   =    4061.91

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3979.07   46.42    1.108  0.30( 0.30) 1.00    5334.8   10200.00
    2     4061.91   53.03    1.040  0.30( 0.30) 1.00    5954.2   10320.00
    3     4061.09   53.17    1.039  0.30( 0.30) 1.00    5964.1   10300.00
    4     3978.51   56.96    1.009  0.30( 0.30) 1.00    6116.4   10210.00
    5     3539.03   85.32    0.866  0.30( 0.30) 1.00    6836.4   10100.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S4.DAT
  TIME/DATE OF STUDY: 10:21 04/01/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.698
   2)   10.00;  3.024
   3)   15.00;  2.067
   4)   20.00;  1.780
   5)   25.00;  1.534
   6)   30.00;  1.349
   7)   40.00;  1.178
   8)   50.00;  1.058
   9)   60.00;  0.977
  10)   90.00;  0.837
  11)  120.00;  0.765
  12)  180.00;  0.656
  13)  360.00;  0.510
  14) 1440.00;  0.231
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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 ************************************************************************
  FLOW PROCESS FROM NODE  10400.00 TO NODE  10401.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.42
  ELEVATION DATA: UPSTREAM(FEET) =   2648.70  DOWNSTREAM(FEET) =   2536.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.799
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.964
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.89      0.30     1.000     0   16.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.82
  TOTAL AREA(ACRES) =      5.89   PEAK FLOW RATE(CFS) =      8.82

 ************************************************************************
  FLOW PROCESS FROM NODE  10401.00 TO NODE  10402.00 IS CODE =  56
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2536.15  DOWNSTREAM(FEET) =   2504.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   934.06   CHANNEL SLOPE =  0.0340
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.63
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.681
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.99
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   5.21
  Tc(MIN.) =   22.00
  SUBAREA AREA(ACRES) =    17.57       SUBAREA RUNOFF(CFS) =   21.85
  EFFECTIVE AREA(ACRES) =     23.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.5          PEAK FLOW RATE(CFS) =      29.17
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   3.41
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.00 =    1884.48 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  10402.00 TO NODE  10402.50 IS CODE =  56
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2504.36  DOWNSTREAM(FEET) =   2462.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.55   CHANNEL SLOPE =  0.0439
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.521
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.72
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   3.36
  Tc(MIN.) =   25.36
  SUBAREA AREA(ACRES) =    56.74       SUBAREA RUNOFF(CFS) =   62.34
  EFFECTIVE AREA(ACRES) =     80.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       80.2         PEAK FLOW RATE(CFS) =      88.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   5.33
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.50 =    2836.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10402.50 TO NODE  10403.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.54  DOWNSTREAM(FEET) =   2433.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.41   CHANNEL SLOPE =  0.0299
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.405
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.16
  AVERAGE FLOW DEPTH(FEET) =   1.75   TRAVEL TIME(MIN.) =   3.12
  Tc(MIN.) =   28.48
  SUBAREA AREA(ACRES) =    68.01       SUBAREA RUNOFF(CFS) =   67.65
  EFFECTIVE AREA(ACRES) =    148.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      148.2         PEAK FLOW RATE(CFS) =     147.41
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.94   FLOW VELOCITY(FEET/SEC.) =   5.47
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10403.00 =    3803.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10403.00 TO NODE  10404.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2433.59  DOWNSTREAM(FEET) =   2239.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2934.12   CHANNEL SLOPE =  0.0662
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.279
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      301.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     280.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.76
  AVERAGE FLOW DEPTH(FEET) =   2.22   TRAVEL TIME(MIN.) =   5.58
  Tc(MIN.) =   34.07
  SUBAREA AREA(ACRES) =   301.25       SUBAREA RUNOFF(CFS) =  265.58
  EFFECTIVE AREA(ACRES) =    449.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      449.5         PEAK FLOW RATE(CFS) =     396.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.67   FLOW VELOCITY(FEET/SEC.) =   9.66
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10404.00 =    6737.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10404.00 TO NODE  10405.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2239.33  DOWNSTREAM(FEET) =   2128.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.32   CHANNEL SLOPE =  0.0386
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.181
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      152.68      0.30     1.000     -
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     456.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.28
  AVERAGE FLOW DEPTH(FEET) =   3.32   TRAVEL TIME(MIN.) =   5.76
  Tc(MIN.) =   39.83
  SUBAREA AREA(ACRES) =   152.68       SUBAREA RUNOFF(CFS) =  121.07
  EFFECTIVE AREA(ACRES) =    602.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      602.1          PEAK FLOW RATE(CFS) =     477.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.39   FLOW VELOCITY(FEET/SEC.) =   8.39
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10405.00 =    9599.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2128.80  DOWNSTREAM(FEET) =   1759.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.12   CHANNEL SLOPE =  0.1878
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.154
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      139.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     531.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.27
  AVERAGE FLOW DEPTH(FEET) =   2.36   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   41.97
  SUBAREA AREA(ACRES) =   139.70       SUBAREA RUNOFF(CFS) =  107.43
  EFFECTIVE AREA(ACRES) =    741.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      741.8          PEAK FLOW RATE(CFS) =     570.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.46   FLOW VELOCITY(FEET/SEC.) =  15.55
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10420.00 =   11566.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.97
  RAINFALL INTENSITY(INCH/HR) =   1.15
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     741.84
  TOTAL STREAM AREA(ACRES) =     741.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     570.45

****************************************************************************
  FLOW PROCESS FROM NODE  10410.00 TO NODE  10411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   413.10
  ELEVATION DATA: UPSTREAM(FEET) =   3217.26  DOWNSTREAM(FEET) =   3058.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.517
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.186
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        3.06      0.30     1.000     0    9.52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.95
  TOTAL AREA(ACRES) =      3.06   PEAK FLOW RATE(CFS) =      7.95

****************************************************************************
  FLOW PROCESS FROM NODE  10411.00 TO NODE  10412.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3058.86  DOWNSTREAM(FEET) =   2879.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.18   CHANNEL SLOPE =  0.3495
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.806
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.25
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   1.62
  Tc(MIN.) =   11.14
  SUBAREA AREA(ACRES) =     4.24       SUBAREA RUNOFF(CFS) =    9.56
  EFFECTIVE AREA(ACRES) =      7.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.3          PEAK FLOW RATE(CFS) =      16.46
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.27   FLOW VELOCITY(FEET/SEC.) =   5.79
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10412.00 =     925.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10412.00 TO NODE  10413.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.84  DOWNSTREAM(FEET) =   2644.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.24   CHANNEL SLOPE =  0.1208
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.996
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.35
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   5.10
  Tc(MIN.) =   16.24
  SUBAREA AREA(ACRES) =    47.95       SUBAREA RUNOFF(CFS) =   73.18
  EFFECTIVE AREA(ACRES) =     55.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.2         PEAK FLOW RATE(CFS) =      84.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   7.40
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10413.00 =    2869.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10413.00 TO NODE  10414.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2644.97  DOWNSTREAM(FEET) =   2550.42
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.61   CHANNEL SLOPE =  0.0468
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.03
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.722
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.60      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     181.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.82
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   4.94
  Tc(MIN.) =   21.18
  SUBAREA AREA(ACRES) =   151.60       SUBAREA RUNOFF(CFS) =  194.02
  EFFECTIVE AREA(ACRES) =    206.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.9          PEAK FLOW RATE(CFS) =     264.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.36   FLOW VELOCITY(FEET/SEC.) =   7.61
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10414.00 =    4889.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10414.00 TO NODE  10415.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2550.42  DOWNSTREAM(FEET) =   2391.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.76   CHANNEL SLOPE =  0.0830
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.51
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.570
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      206.03      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     382.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.38
  AVERAGE FLOW DEPTH(FEET) =   2.47   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   24.26
  SUBAREA AREA(ACRES) =   206.03       SUBAREA RUNOFF(CFS) =  235.60
  EFFECTIVE AREA(ACRES) =    412.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      412.9          PEAK FLOW RATE(CFS) =     472.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.76   FLOW VELOCITY(FEET/SEC.) =  11.03
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10415.00 =    6805.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10415.00 TO NODE  10416.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   2391.31  DOWNSTREAM(FEET) =   2092.16
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2843.10   CHANNEL SLOPE =  0.1052
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.79
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.420
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      122.38      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     533.86
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.42
 AVERAGE FLOW DEPTH(FEET) =   2.77   TRAVEL TIME(MIN.) =   3.81
 Tc(MIN.) =   28.07
 SUBAREA AREA(ACRES) =   122.38       SUBAREA RUNOFF(CFS) =  123.40
 EFFECTIVE AREA(ACRES) =    535.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      535.3         PEAK FLOW RATE(CFS) =     539.73
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.78

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.78   FLOW VELOCITY(FEET/SEC.) =  12.47
 LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10416.00 =    9648.99 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2092.16  DOWNSTREAM(FEET) =   1759.52
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2151.95   CHANNEL SLOPE =  0.1546
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.59
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.340
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       59.94      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     567.77
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.50
 AVERAGE FLOW DEPTH(FEET) =   2.58   TRAVEL TIME(MIN.) =   2.47
 Tc(MIN.) =   30.55
 SUBAREA AREA(ACRES) =    59.94       SUBAREA RUNOFF(CFS) =   56.09
 EFFECTIVE AREA(ACRES) =    595.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      595.2         PEAK FLOW RATE(CFS) =     556.97
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.55
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.55   FLOW VELOCITY(FEET/SEC.) =  14.44
 LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   30.55
 RAINFALL INTENSITY(INCH/HR) =   1.34
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     595.20
 TOTAL STREAM AREA(ACRES) =     595.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     556.97

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      570.45   41.97    1.154  0.30( 0.30) 1.00     741.8   10400.00
     2      556.97   30.55    1.340  0.30( 0.30) 1.00     595.2   10410.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1062.18   30.55    1.340  0.30( 0.30) 1.00    1135.1   10410.00
     2     1028.14   41.97    1.154  0.30( 0.30) 1.00    1337.0   10400.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1062.18    Tc(MIN.) =    30.55
 EFFECTIVE AREA(ACRES) =    1135.08   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1337.0
 LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1759.52  DOWNSTREAM(FEET) =   1688.35
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2477.21   CHANNEL SLOPE =  0.0287
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.53
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.265
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED                -       72.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1093.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.40
  AVERAGE FLOW DEPTH(FEET) =   5.53   TRAVEL TIME(MIN.) =   4.39
  Tc(MIN.) =   34.94
  SUBAREA AREA(ACRES) =    72.64       SUBAREA RUNOFF(CFS) =   63.06
  EFFECTIVE AREA(ACRES) =   1207.72     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1409.7          PEAK FLOW RATE(CFS) =    1062.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.45   FLOW VELOCITY(FEET/SEC.) =   9.32
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S3.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     3979.07   46.42  0.30( 0.30) 1.00    5334.8   10200.00
      2     4061.91   53.03  0.30( 0.30) 1.00    5954.2   10320.00
      3     4061.09   53.17  0.30( 0.30) 1.00    5964.1   10300.00
      4     3978.51   56.96  0.30( 0.30) 1.00    6116.4   10210.00
      5     3539.03   85.32  0.30( 0.30) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =     6836.4

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     3979.07   46.42  0.30( 0.30) 1.00    5334.8   10200.00
      2     4061.91   53.03  0.30( 0.30) 1.00    5954.2   10320.00
      3     4061.09   53.17  0.30( 0.30) 1.00    5964.1   10300.00
      4     3978.51   56.96  0.30( 0.30) 1.00    6116.4   10210.00
      5     3539.03   85.32  0.30( 0.30) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =      6836.4
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1739.96  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2238.93   CHANNEL SLOPE =  0.0231
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.24
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.006
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       61.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4081.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.91
  AVERAGE FLOW DEPTH(FEET) =   7.24   TRAVEL TIME(MIN.) =   3.42
  Tc(MIN.) =   56.45
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =   39.34
  EFFECTIVE AREA(ACRES) =   6016.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6898.3          PEAK FLOW RATE(CFS) =    4061.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.22   FLOW VELOCITY(FEET/SEC.) =  10.89
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3979.07   49.86    1.060  0.30( 0.30) 1.00    5396.7   10200.00
      2     4061.91   56.45    1.006  0.30( 0.30) 1.00    6016.2   10320.00
      3     4061.09   56.59    1.005  0.30( 0.30) 1.00    6026.0   10300.00
      4     3978.51   60.40    0.975  0.30( 0.30) 1.00    6178.4   10210.00
      5     3539.03   88.88    0.842  0.30( 0.30) 1.00    6898.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1062.18   34.94    1.265  0.30( 0.30) 1.00    1207.7   10410.00
      2     1028.14   46.41    1.101  0.30( 0.30) 1.00    1409.7   10400.00
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4601.72	34.94	1.265	0.30(0.30)	1.00	4989.3	10410.00
2	4933.47	46.41	1.101	0.30(0.30)	1.00	6432.7	10400.00
3	4954.04	49.86	1.060	0.30(0.30)	1.00	6806.4	10200.00
4	4967.63	56.45	1.006	0.30(0.30)	1.00	7425.9	10320.00
5	4965.39	56.59	1.005	0.30(0.30)	1.00	7435.7	10300.00
6	4844.96	60.40	0.975	0.30(0.30)	1.00	7588.0	10210.00
7	4234.96	88.88	0.842	0.30(0.30)	1.00	8308.0	10100.00

TOTAL AREA(ACRES) = 8308.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4967.63 Tc(MIN.) = 56.454
EFFECTIVE AREA(ACRES) = 7425.85 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 8308.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 8308.0 TC(MIN.) = 56.45
EFFECTIVE AREA(ACRES) = 7425.85 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998
PEAK FLOW RATE(CFS) = 4967.63

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4601.72	34.94	1.265	0.30(0.30)	1.00	4989.3	10410.00
2	4933.47	46.41	1.101	0.30(0.30)	1.00	6432.7	10400.00
3	4954.04	49.86	1.060	0.30(0.30)	1.00	6806.4	10200.00
4	4967.63	56.45	1.006	0.30(0.30)	1.00	7425.9	10320.00
5	4965.39	56.59	1.005	0.30(0.30)	1.00	7435.7	10300.00
6	4844.96	60.40	0.975	0.30(0.30)	1.00	7588.0	10210.00
7	4234.96	88.88	0.842	0.30(0.30)	1.00	8308.0	10100.00

==========

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END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S5.DAT
  TIME/DATE OF STUDY: 10:21 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.698
   2)   10.00;  3.024
   3)   15.00;  2.067
   4)   20.00;  1.780
   5)   25.00;  1.534
   6)   30.00;  1.349
   7)   40.00;  1.178
   8)   50.00;  1.058
   9)   60.00;  0.977
  10)   90.00;  0.837
  11)  120.00;  0.765
  12)  180.00;  0.656
  13)  360.00;  0.510
  14) 1440.00;  0.231
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10500.00 TO NODE  10501.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.64
  ELEVATION DATA: UPSTREAM(FEET) =   3108.31  DOWNSTREAM(FEET) =   3060.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.565
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  4.174
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          -        1.54      0.30      0.910     0    6.57
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
  SUBAREA RUNOFF(CFS) =      5.41
  TOTAL AREA(ACRES) =      1.54   PEAK FLOW RATE(CFS) =      5.41

************************************************************************
  FLOW PROCESS FROM NODE  10501.00 TO NODE  10502.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3060.24  DOWNSTREAM(FEET) =   2942.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.48   CHANNEL SLOPE =  0.1703
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.356
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.27      0.30      0.943     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.943
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.71
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =    9.01
  SUBAREA AREA(ACRES) =     8.27       SUBAREA RUNOFF(CFS) =   22.87
  EFFECTIVE AREA(ACRES) =      9.81     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =        9.8          PEAK FLOW RATE(CFS) =      27.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   5.60
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10502.00 =     986.12 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10502.00 TO NODE  10503.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2942.64  DOWNSTREAM(FEET) =   2815.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   957.31   CHANNEL SLOPE =  0.1331
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.731
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.33
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   2.52
  Tc(MIN.) =   11.53
  SUBAREA AREA(ACRES) =    18.91       SUBAREA RUNOFF(CFS) =   41.38
  EFFECTIVE AREA(ACRES) =     28.72     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       28.7         PEAK FLOW RATE(CFS) =      63.01
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   6.96
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10503.00 =    1943.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10503.00 TO NODE  10504.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2815.24  DOWNSTREAM(FEET) =   2202.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2096.20   CHANNEL SLOPE =  0.2923
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.02
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.144
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.49      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     126.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.39
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   3.07
  Tc(MIN.) =   14.60
  SUBAREA AREA(ACRES) =    75.49       SUBAREA RUNOFF(CFS) =  125.29
  EFFECTIVE AREA(ACRES) =    104.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =     173.12
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =  12.65
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10504.00 =    4039.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10504.00 TO NODE  10505.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2202.44  DOWNSTREAM(FEET) =   1969.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.32   CHANNEL SLOPE =  0.0834
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.54
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.829
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      278.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     365.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.26
  AVERAGE FLOW DEPTH(FEET) =   2.41   TRAVEL TIME(MIN.) =   4.55
  Tc(MIN.) =   19.15
  SUBAREA AREA(ACRES) =   278.21       SUBAREA RUNOFF(CFS) =  382.83
  EFFECTIVE AREA(ACRES) =    382.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      382.4         PEAK FLOW RATE(CFS) =     526.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.92   FLOW VELOCITY(FEET/SEC.) =  11.39
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10505.00 =    6839.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10505.00 TO NODE  10506.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1969.00  DOWNSTREAM(FEET) =   1759.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.99   CHANNEL SLOPE =  0.0725
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.64
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.621
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      323.47      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     718.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.80
  AVERAGE FLOW DEPTH(FEET) =   3.56   TRAVEL TIME(MIN.) =   4.09
  Tc(MIN.) =   23.24
  SUBAREA AREA(ACRES) =   323.47       SUBAREA RUNOFF(CFS) =  384.54
  EFFECTIVE AREA(ACRES) =    705.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      705.9         PEAK FLOW RATE(CFS) =     839.32
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.86   FLOW VELOCITY(FEET/SEC.) =  12.29
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10506.00 =    9732.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1759.23  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2597.28   CHANNEL SLOPE =  0.0273
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.27
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.419
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.34      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     946.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.88
  AVERAGE FLOW DEPTH(FEET) =   5.22   TRAVEL TIME(MIN.) =   4.87
  Tc(MIN.) =   28.11
  SUBAREA AREA(ACRES) =   212.34       SUBAREA RUNOFF(CFS) =  213.85
  EFFECTIVE AREA(ACRES) =    918.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      918.2         PEAK FLOW RATE(CFS) =     924.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.16   FLOW VELOCITY(FEET/SEC.) =   8.82
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      918.2  TC(MIN.) =     28.11
  EFFECTIVE AREA(ACRES) =    918.23  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =     924.91
============================================================================
```



```
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S6.DAT
  TIME/DATE OF STUDY: 10:21 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.635
   2)   10.00;  2.989
   3)   15.00;  2.053
   4)   20.00;  1.767
   5)   25.00;  1.524
   6)   30.00;  1.342
   7)   40.00;  1.170
   8)   50.00;  1.051
   9)   60.00;  0.969
  10)   90.00;  0.828
  11)  120.00;  0.756
  12)  180.00;  0.647
  13)  360.00;  0.502
  14) 1440.00;  0.227
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10600.00 TO NODE  10601.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   312.13
  ELEVATION DATA: UPSTREAM(FEET) =   3250.51  DOWNSTREAM(FEET) =   3126.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.451
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.499
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.47      0.30     1.000     0    8.45
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.11
  TOTAL AREA(ACRES) =      2.47   PEAK FLOW RATE(CFS) =      7.11

************************************************************************
  FLOW PROCESS FROM NODE  10601.00 TO NODE  10602.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3126.78  DOWNSTREAM(FEET) =   2951.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.40   CHANNEL SLOPE =  0.2828
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.909
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        6.58      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.23
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   1.98
  Tc(MIN.) =   10.43
  SUBAREA AREA(ACRES) =     6.58       SUBAREA RUNOFF(CFS) =   15.45
  EFFECTIVE AREA(ACRES) =      9.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =      21.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   6.02
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10602.00 =     932.53 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10602.00 TO NODE  10603.00 IS CODE =  56
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2951.30  DOWNSTREAM(FEET) =   2641.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1930.18   CHANNEL SLOPE =  0.1606
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.131
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      73.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.74
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   4.15
  Tc(MIN.) =   14.58
  SUBAREA AREA(ACRES) =    60.78       SUBAREA RUNOFF(CFS) =  100.18
  EFFECTIVE AREA(ACRES) =     69.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.8         PEAK FLOW RATE(CFS) =     115.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   9.00
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10603.00 =    2862.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10603.00 TO NODE  10604.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2641.28  DOWNSTREAM(FEET) =   2318.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.90   CHANNEL SLOPE =  0.1640
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.893
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     164.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.19
  AVERAGE FLOW DEPTH(FEET) =   1.28   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =   17.80
  SUBAREA AREA(ACRES) =    68.78       SUBAREA RUNOFF(CFS) =   98.61
  EFFECTIVE AREA(ACRES) =    138.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      138.6         PEAK FLOW RATE(CFS) =     198.72
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOW VELOCITY(FEET/SEC.) =  10.81
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10604.00 =    4829.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10604.00 TO NODE  10605.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2318.61  DOWNSTREAM(FEET) =   1983.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2601.81   CHANNEL SLOPE =  0.1286
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.01
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.689
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      178.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     310.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.39
  AVERAGE FLOW DEPTH(FEET) =   1.96   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   21.61
  SUBAREA AREA(ACRES) =   178.16       SUBAREA RUNOFF(CFS) =  222.71
  EFFECTIVE AREA(ACRES) =    316.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      316.8         PEAK FLOW RATE(CFS) =     395.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.24   FLOW VELOCITY(FEET/SEC.) =  12.22
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10605.00 =    7431.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1983.94  DOWNSTREAM(FEET) =   1655.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2439.06   CHANNEL SLOPE =  0.1348
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.534
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.31      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     430.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.74
  AVERAGE FLOW DEPTH(FEET) =   2.31   TRAVEL TIME(MIN.) =   3.19
  Tc(MIN.) =   24.80
  SUBAREA AREA(ACRES) =    61.31       SUBAREA RUNOFF(CFS) =   68.09
  EFFECTIVE AREA(ACRES) =    378.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      378.1          PEAK FLOW RATE(CFS) =     419.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.28   FLOW VELOCITY(FEET/SEC.) =  12.66
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S4.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     4601.72   34.94  0.30( 0.30) 1.00    4989.3   10410.00
      2     4933.47   46.41  0.30( 0.30) 1.00    6432.7   10400.00
      3     4954.04   49.86  0.30( 0.30) 1.00    6806.4   10200.00
      4     4967.63   56.45  0.30( 0.30) 1.00    7425.9   10320.00
      5     4965.39   56.59  0.30( 0.30) 1.00    7435.7   10300.00
      6     4844.96   60.40  0.30( 0.30) 1.00    7588.0   10210.00
      7     4234.96   88.88  0.30( 0.30) 1.00    8308.0   10100.00
    TOTAL AREA(ACRES) =     8308.0

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S5.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      924.91   28.11  0.30( 0.30) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =      918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
```



```
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      924.91   28.11  0.30( 0.30) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =      918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      924.91   28.11    1.411  0.30( 0.30) 1.00     918.2   10500.00
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4601.72   34.94    1.257  0.30( 0.30) 1.00    4989.3   10410.00
      2     4933.47   46.41    1.094  0.30( 0.30) 1.00    6432.7   10400.00
      3     4954.04   49.86    1.053  0.30( 0.30) 1.00    6806.4   10200.00
      4     4967.63   56.45    0.998  0.30( 0.30) 1.00    7425.9   10320.00
      5     4965.39   56.59    0.997  0.30( 0.30) 1.00    7435.7   10300.00
      6     4844.96   60.40    0.967  0.30( 0.30) 1.00    7588.0   10210.00
      7     4234.96   88.88    0.833  0.30( 0.30) 1.00    8308.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5221.73   28.11    1.411  0.30( 0.30) 1.00    4932.6   10500.00
      2     5398.67   34.94    1.257  0.30( 0.30) 1.00    5907.6   10410.00
      3     5594.47   46.41    1.094  0.30( 0.30) 1.00    7350.9   10400.00
      4     5580.83   49.86    1.053  0.30( 0.30) 1.00    7724.7   10200.00
      5     5548.97   56.45    0.998  0.30( 0.30) 1.00    8344.1   10320.00
      6     5545.80   56.59    0.997  0.30( 0.30) 1.00    8353.9   10300.00
      7     5400.52   60.40    0.967  0.30( 0.30) 1.00    8506.3   10210.00
      8     4679.11   88.88    0.833  0.30( 0.30) 1.00    9226.2   10100.00
    TOTAL AREA(ACRES) =      9226.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5594.47  Tc(MIN.) =   46.406
  EFFECTIVE AREA(ACRES) =   7350.89  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     9226.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10507.00 TO NODE  10620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1688.35  DOWNSTREAM(FEET) =   1655.24
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2570.61   CHANNEL SLOPE =  0.0129
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.82
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.044
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       83.74      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5622.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.63
 AVERAGE FLOW DEPTH(FEET) =   9.82   TRAVEL TIME(MIN.) =   4.45
 Tc(MIN.) =   50.86
 SUBAREA AREA(ACRES) =    83.74       SUBAREA RUNOFF(CFS) =   56.08
 EFFECTIVE AREA(ACRES) =   7434.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     9310.0         PEAK FLOW RATE(CFS) =    5594.47
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.80

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.80   FLOW VELOCITY(FEET/SEC.) =   9.61
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     5221.73   32.64    1.297  0.30( 0.30) 1.00    5016.3   10500.00
     2     5398.67   39.43    1.180  0.30( 0.30) 1.00    5991.3   10410.00
     3     5594.47   50.86    1.044  0.30( 0.30) 1.00    7434.6   10400.00
     4     5580.83   54.31    1.016  0.30( 0.30) 1.00    7808.4   10200.00
     5     5548.97   60.91    0.965  0.30( 0.30) 1.00    8427.8   10320.00
     6     5545.80   61.05    0.964  0.30( 0.30) 1.00    8437.6   10300.00
     7     5400.52   64.89    0.946  0.30( 0.30) 1.00    8590.0   10210.00
     8     4679.11   93.55    0.819  0.30( 0.30) 1.00    9310.0   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      419.87   24.80    1.534  0.30( 0.30) 1.00     378.1   10600.00
 LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     5330.95   24.80    1.534  0.30( 0.30) 1.00    4189.1   10600.00
```



```
     2     5560.86   32.64    1.297  0.30( 0.30) 1.00    5394.4   10500.00
     3     5698.08   39.43    1.180  0.30( 0.30) 1.00    6369.4   10410.00
     4     5847.65   50.86    1.044  0.30( 0.30) 1.00    7812.7   10400.00
     5     5824.37   54.31    1.016  0.30( 0.30) 1.00    8186.5   10200.00
     6     5775.18   60.91    0.965  0.30( 0.30) 1.00    8805.9   10320.00
     7     5771.78   61.05    0.964  0.30( 0.30) 1.00    8815.7   10300.00
     8     5620.36   64.89    0.946  0.30( 0.30) 1.00    8968.1   10210.00
     9     4855.90   93.55    0.819  0.30( 0.30) 1.00    9688.1   10100.00
   TOTAL AREA(ACRES) =      9688.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     5847.65  Tc(MIN.) =   50.857
 EFFECTIVE AREA(ACRES) =   7812.71  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     9688.1
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10620.00 TO NODE  10621.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1655.24  DOWNSTREAM(FEET) =   1584.84
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2294.47   CHANNEL SLOPE =  0.0307
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.16
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.021
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      342.43      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5958.71
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.43
 AVERAGE FLOW DEPTH(FEET) =   8.15   TRAVEL TIME(MIN.) =   2.85
 Tc(MIN.) =   53.71
 SUBAREA AREA(ACRES) =   342.43       SUBAREA RUNOFF(CFS) =  222.11
 EFFECTIVE AREA(ACRES) =   8155.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    10030.5         PEAK FLOW RATE(CFS) =    5847.65
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.07

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.07   FLOW VELOCITY(FEET/SEC.) =  13.36
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10621.00 =   40157.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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```
  ELEVATION DATA: UPSTREAM(FEET) =   1584.84  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2923.79   CHANNEL SLOPE =  0.0482
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.24
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.995
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      160.90      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5898.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.76
  AVERAGE FLOW DEPTH(FEET) =   7.24   TRAVEL TIME(MIN.) =   3.09
  Tc(MIN.) =   56.80
  SUBAREA AREA(ACRES) =   160.90       SUBAREA RUNOFF(CFS) =  100.69
  EFFECTIVE AREA(ACRES) =   8316.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10191.4         PEAK FLOW RATE(CFS) =    5847.65
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.21   FLOW VELOCITY(FEET/SEC.) =  15.72
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   56.80
  RAINFALL INTENSITY(INCH/HR) =   1.00
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    8316.04
  TOTAL STREAM AREA(ACRES) =   10191.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    5847.65

****************************************************************************
  FLOW PROCESS FROM NODE  10630.00 TO NODE  10631.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.79
  ELEVATION DATA: UPSTREAM(FEET) =   3257.00  DOWNSTREAM(FEET) =   3147.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.430
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.506
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
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```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.25      0.30     1.000     0    8.43
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.61
  TOTAL AREA(ACRES) =      1.25   PEAK FLOW RATE(CFS) =      3.61

****************************************************************************
  FLOW PROCESS FROM NODE  10631.00 TO NODE  10632.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3147.13  DOWNSTREAM(FEET) =   2774.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   640.96   CHANNEL SLOPE =  0.5817
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.17
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.919
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.75      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.49
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   1.94
  Tc(MIN.) =   10.37
  SUBAREA AREA(ACRES) =     4.75       SUBAREA RUNOFF(CFS) =   11.20
  EFFECTIVE AREA(ACRES) =      6.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      14.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   6.44
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10632.00 =     939.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10632.00 TO NODE  10633.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2774.29  DOWNSTREAM(FEET) =   2004.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.65   CHANNEL SLOPE =  0.4039
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.394
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED                -       79.75      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      90.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.33
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   13.18
  SUBAREA AREA(ACRES) =    79.75       SUBAREA RUNOFF(CFS) =  150.32
  EFFECTIVE AREA(ACRES) =     85.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       85.8          PEAK FLOW RATE(CFS) =     161.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =  13.77
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10633.00 =    2845.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10633.00 TO NODE  10634.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.58  DOWNSTREAM(FEET) =   1714.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1868.05   CHANNEL SLOPE =  0.1550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.75
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.002
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      124.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     257.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.50
  AVERAGE FLOW DEPTH(FEET) =   1.68   TRAVEL TIME(MIN.) =   2.71
  Tc(MIN.) =   15.89
  SUBAREA AREA(ACRES) =   124.45       SUBAREA RUNOFF(CFS) =  190.68
  EFFECTIVE AREA(ACRES) =    210.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      210.2         PEAK FLOW RATE(CFS) =     322.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.90   FLOW VELOCITY(FEET/SEC.) =  12.31
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10634.00 =    4713.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1714.99  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.34   CHANNEL SLOPE =  0.1609
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.98
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.877
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       42.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     351.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.79
  AVERAGE FLOW DEPTH(FEET) =   1.97   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =   18.08
  SUBAREA AREA(ACRES) =    42.00       SUBAREA RUNOFF(CFS) =   59.60
  EFFECTIVE AREA(ACRES) =    252.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.2         PEAK FLOW RATE(CFS) =     357.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.99   FLOW VELOCITY(FEET/SEC.) =  12.88
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10640.00 =    6398.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.08
  RAINFALL INTENSITY(INCH/HR) =   1.88
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     252.20
  TOTAL STREAM AREA(ACRES) =     252.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     357.90

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5330.95   30.87    1.327  0.30( 0.30) 1.00    4692.4   10600.00
      1     5560.86   38.65    1.193  0.30( 0.30) 1.00    5897.7   10500.00
      1     5698.08   45.41    1.106  0.30( 0.30) 1.00    6872.7   10410.00
      1     5847.65   56.80    0.995  0.30( 0.30) 1.00    8316.0   10400.00
      1     5824.37   60.26    0.968  0.30( 0.30) 1.00    8689.8   10200.00
      1     5775.18   66.87    0.937  0.30( 0.30) 1.00    9309.2   10320.00
      1     5771.78   67.01    0.936  0.30( 0.30) 1.00    9319.1   10300.00
      1     5620.36   70.90    0.918  0.30( 0.30) 1.00    9471.4   10210.00
      1     4855.90   99.80    0.804  0.30( 0.30) 1.00   10191.4   10100.00
```

```
    2      357.90   18.08    1.877  0.30( 0.30) 1.00     252.2   10630.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5150.82   18.08    1.877  0.30( 0.30) 1.00    3000.5   10630.00
      2     5564.07   30.87    1.327  0.30( 0.30) 1.00    4944.6   10600.00
      3     5763.61   38.65    1.193  0.30( 0.30) 1.00    6149.9   10500.00
      4     5880.96   45.41    1.106  0.30( 0.30) 1.00    7124.9   10410.00
      5     6005.48   56.80    0.995  0.30( 0.30) 1.00    8568.2   10400.00
      6     5975.96   60.26    0.968  0.30( 0.30) 1.00    8942.0   10200.00
      7     5919.71   66.87    0.937  0.30( 0.30) 1.00    9561.4   10320.00
      8     5916.17   67.01    0.936  0.30( 0.30) 1.00    9571.3   10300.00
      9     5760.60   70.90    0.918  0.30( 0.30) 1.00    9723.6   10210.00
     10     4970.42   99.80    0.804  0.30( 0.30) 1.00   10443.6   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    6005.48    Tc(MIN.) =    56.80
  EFFECTIVE AREA(ACRES) =    8568.24   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    10443.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1443.87  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2254.45   CHANNEL SLOPE =  0.0548
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.08
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.977
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6034.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.62
  AVERAGE FLOW DEPTH(FEET) =   7.08   TRAVEL TIME(MIN.) =   2.26
  Tc(MIN.) =   59.06
  SUBAREA AREA(ACRES) =    94.37       SUBAREA RUNOFF(CFS) =   57.48
  EFFECTIVE AREA(ACRES) =   8662.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10538.0         PEAK FLOW RATE(CFS) =    6005.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
  DEPTH(FEET) =  7.07   FLOW VELOCITY(FEET/SEC.) =  16.59
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    10538.0  TC(MIN.) =     59.06
  EFFECTIVE AREA(ACRES) =   8662.61  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    6005.48

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5150.82   20.44    1.746  0.30( 0.30) 1.00    3094.8   10630.00
      2     5564.07   33.18    1.287  0.30( 0.30) 1.00    5039.0   10600.00
      3     5763.61   40.94    1.159  0.30( 0.30) 1.00    6244.3   10500.00
      4     5880.96   47.68    1.079  0.30( 0.30) 1.00    7219.3   10410.00
      5     6005.48   59.06    0.977  0.30( 0.30) 1.00    8662.6   10400.00
      6     5975.96   62.52    0.957  0.30( 0.30) 1.00    9036.4   10200.00
      7     5919.71   69.14    0.926  0.30( 0.30) 1.00    9655.8   10320.00
      8     5916.17   69.28    0.925  0.30( 0.30) 1.00    9665.6   10300.00
      9     5760.60   73.19    0.907  0.30( 0.30) 1.00    9818.0   10210.00
     10     4970.42  102.19    0.799  0.30( 0.30) 1.00   10538.0   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S7.DAT
  TIME/DATE OF STUDY: 10:21 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.635
   2)   10.00;  2.989
   3)   15.00;  2.053
   4)   20.00;  1.767
   5)   25.00;  1.524
   6)   30.00;  1.342
   7)   40.00;  1.170
   8)   50.00;  1.051
   9)   60.00;  0.969
  10)   90.00;  0.828
  11)  120.00;  0.756
  12)  180.00;  0.647
  13)  360.00;  0.502
  14) 1440.00;  0.227
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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************************************************************************
  FLOW PROCESS FROM NODE  10700.00 TO NODE  10701.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   281.18
  ELEVATION DATA: UPSTREAM(FEET) =   3512.68  DOWNSTREAM(FEET) =   3444.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.938
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.339
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.30      0.30     1.000      0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.56
  TOTAL AREA(ACRES) =      1.30   PEAK FLOW RATE(CFS) =      3.56

************************************************************************
  FLOW PROCESS FROM NODE  10701.00 TO NODE  10702.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3444.33  DOWNSTREAM(FEET) =   3246.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   700.05   CHANNEL SLOPE =  0.2823
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.722
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.49      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.69
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   11.43
  SUBAREA AREA(ACRES) =     6.49       SUBAREA RUNOFF(CFS) =   14.15
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8          PEAK FLOW RATE(CFS) =      16.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   5.48
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10702.00 =     981.23 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10702.00 TO NODE  10703.00 IS CODE =  56
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3246.68  DOWNSTREAM(FEET) =   3075.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1893.56   CHANNEL SLOPE =  0.0906
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.913
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.98      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.24
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   6.02
  Tc(MIN.) =   17.45
  SUBAREA AREA(ACRES) =    31.98       SUBAREA RUNOFF(CFS) =   46.43
  EFFECTIVE AREA(ACRES) =     39.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       39.8         PEAK FLOW RATE(CFS) =      57.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   5.93
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.00 =    2874.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.00 TO NODE  10703.50 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3075.14  DOWNSTREAM(FEET) =   2952.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2060.61   CHANNEL SLOPE =  0.0597
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.599
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.58      0.30     0.872     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.872
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      78.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.71
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   6.02
  Tc(MIN.) =   23.46
  SUBAREA AREA(ACRES) =    34.58       SUBAREA RUNOFF(CFS) =   41.62
  EFFECTIVE AREA(ACRES) =     74.35     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       74.4         PEAK FLOW RATE(CFS) =      88.10
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOW VELOCITY(FEET/SEC.) =   5.92
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.50 =    4935.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.50 TO NODE  10704.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2952.03  DOWNSTREAM(FEET) =   2895.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.70   CHANNEL SLOPE =  0.0606
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.490
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.69      0.30     0.951     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     104.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.30
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   25.93
  SUBAREA AREA(ACRES) =    30.69       SUBAREA RUNOFF(CFS) =   33.28
  EFFECTIVE AREA(ACRES) =    105.04     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      105.0         PEAK FLOW RATE(CFS) =     114.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   6.46
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10704.00 =    5866.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2895.59  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2585.44   CHANNEL SLOPE =  0.1217
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.65
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.337
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.40      0.30     0.977     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     207.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.91
  AVERAGE FLOW DEPTH(FEET) =   1.59   TRAVEL TIME(MIN.) =   4.35
  Tc(MIN.) =   30.27
  SUBAREA AREA(ACRES) =   199.40       SUBAREA RUNOFF(CFS) =  187.40
  EFFECTIVE AREA(ACRES) =    304.44     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      304.4          PEAK FLOW RATE(CFS) =     287.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.90   FLOW VELOCITY(FEET/SEC.) =  10.92
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.27
  RAINFALL INTENSITY(INCH/HR) =   1.34
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     304.44
  TOTAL STREAM AREA(ACRES) =     304.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     287.07

****************************************************************************
  FLOW PROCESS FROM NODE  10710.00 TO NODE  10711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.64
  ELEVATION DATA: UPSTREAM(FEET) =   3389.13  DOWNSTREAM(FEET) =   3276.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.438
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.720
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK               -        7.76      0.30     0.981     0   11.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.981
  SUBAREA RUNOFF(CFS) =     16.94
  TOTAL AREA(ACRES) =      7.76   PEAK FLOW RATE(CFS) =     16.94

****************************************************************************
  FLOW PROCESS FROM NODE  10711.00 TO NODE  10712.00 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3276.30  DOWNSTREAM(FEET) =   3152.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   950.69   CHANNEL SLOPE =  0.1305
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.197
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       22.39      0.30     0.988     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.988
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.67
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   14.23
  SUBAREA AREA(ACRES) =    22.39       SUBAREA RUNOFF(CFS) =   38.30
  EFFECTIVE AREA(ACRES) =     30.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       30.1          PEAK FLOW RATE(CFS) =      51.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   6.42
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10712.00 =    1894.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10712.00 TO NODE  10713.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3152.26  DOWNSTREAM(FEET) =   2879.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.77   CHANNEL SLOPE =  0.1431
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.861
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       42.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.73
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   4.12
  Tc(MIN.) =   18.35
  SUBAREA AREA(ACRES) =    42.59       SUBAREA RUNOFF(CFS) =   59.86
  EFFECTIVE AREA(ACRES) =     72.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       72.7          PEAK FLOW RATE(CFS) =     102.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.02   FLOW VELOCITY(FEET/SEC.) =   8.36
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10713.00 =    3804.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.03  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2621.96   CHANNEL SLOPE =  0.1136
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.64
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.624
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      156.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     196.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.51
  AVERAGE FLOW DEPTH(FEET) =   1.57   TRAVEL TIME(MIN.) =   4.59
  Tc(MIN.) =   22.94
  SUBAREA AREA(ACRES) =   156.72       SUBAREA RUNOFF(CFS) =  186.76
  EFFECTIVE AREA(ACRES) =    229.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      229.5         PEAK FLOW RATE(CFS) =     273.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.89   FLOW VELOCITY(FEET/SEC.) =  10.51
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10720.00 =    6426.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.94
  RAINFALL INTENSITY(INCH/HR) =   1.62
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     229.46
  TOTAL STREAM AREA(ACRES) =     229.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     273.56
```



```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      287.07   30.27    1.337  0.30( 0.29) 0.97      304.4   10700.00
      2      273.56   22.94    1.624  0.30( 0.30) 1.00      229.5   10710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      550.64   22.94    1.624  0.30( 0.29) 0.98      460.2   10710.00
      2      501.41   30.27    1.337  0.30( 0.29) 0.98      533.9   10700.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     550.64    Tc(MIN.) =    22.94
  EFFECTIVE AREA(ACRES) =     460.16   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =      533.9
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.00 TO NODE  10720.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.07  DOWNSTREAM(FEET) =   2523.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.13   CHANNEL SLOPE =  0.0339
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.01
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.479
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     612.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.57
  AVERAGE FLOW DEPTH(FEET) =   3.98   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   26.25
  SUBAREA AREA(ACRES) =   116.31       SUBAREA RUNOFF(CFS) =  123.38
  EFFECTIVE AREA(ACRES) =    576.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      650.2         PEAK FLOW RATE(CFS) =     613.80
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.99   FLOW VELOCITY(FEET/SEC.) =   8.56
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.50 =   10150.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.50 TO NODE  10721.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2523.48  DOWNSTREAM(FEET) =   2488.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1575.08   CHANNEL SLOPE =  0.0221
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.59
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.350
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     652.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.45
  AVERAGE FLOW DEPTH(FEET) =   4.57   TRAVEL TIME(MIN.) =   3.52
  Tc(MIN.) =   29.77
  SUBAREA AREA(ACRES) =    82.28       SUBAREA RUNOFF(CFS) =   77.79
  EFFECTIVE AREA(ACRES) =    658.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      732.5         PEAK FLOW RATE(CFS) =     625.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.48   FLOW VELOCITY(FEET/SEC.) =   7.37
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.00 =   11725.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.00 TO NODE  10721.50 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2488.66  DOWNSTREAM(FEET) =   2453.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2032.11   CHANNEL SLOPE =  0.0174
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.19
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.263
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      259.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     737.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.05
  AVERAGE FLOW DEPTH(FEET) =   5.15   TRAVEL TIME(MIN.) =   4.81
  Tc(MIN.) =   34.58
  SUBAREA AREA(ACRES) =   259.52       SUBAREA RUNOFF(CFS) =  225.00
  EFFECTIVE AREA(ACRES) =    918.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      992.0         PEAK FLOW RATE(CFS) =     798.41
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.36   FLOW VELOCITY(FEET/SEC.) =   7.19
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.50 =   13757.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.50 TO NODE  10722.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.35  DOWNSTREAM(FEET) =   2384.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1842.37   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.209
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      229.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     892.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.82
  AVERAGE FLOW DEPTH(FEET) =   4.69   TRAVEL TIME(MIN.) =   3.13
  Tc(MIN.) =   37.70
  SUBAREA AREA(ACRES) =   229.78       SUBAREA RUNOFF(CFS) =  188.10
  EFFECTIVE AREA(ACRES) =   1148.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1221.8         PEAK FLOW RATE(CFS) =     942.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.82   FLOW VELOCITY(FEET/SEC.) =   9.95
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10722.00 =   15600.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10722.00 TO NODE  10723.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2384.52  DOWNSTREAM(FEET) =   1925.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3780.37   CHANNEL SLOPE =  0.1214
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.82
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      308.58      0.30     1.000     -
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1060.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.83
  AVERAGE FLOW DEPTH(FEET) =   3.80   TRAVEL TIME(MIN.) =   3.98
  Tc(MIN.) =   41.68
  SUBAREA AREA(ACRES) =   308.58       SUBAREA RUNOFF(CFS) =  236.07
  EFFECTIVE AREA(ACRES) =   1456.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1530.4          PEAK FLOW RATE(CFS) =    1116.61
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.91   FLOW VELOCITY(FEET/SEC.) =  16.03
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10723.00 =   19380.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1925.64  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3826.73   CHANNEL SLOPE =  0.1582
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.92
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.108
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      434.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1274.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.30
  AVERAGE FLOW DEPTH(FEET) =   3.91   TRAVEL TIME(MIN.) =   3.49
  Tc(MIN.) =   45.17
  SUBAREA AREA(ACRES) =   434.11       SUBAREA RUNOFF(CFS) =  315.90
  EFFECTIVE AREA(ACRES) =   1890.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1964.5          PEAK FLOW RATE(CFS) =    1378.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.06   FLOW VELOCITY(FEET/SEC.) =  18.71
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1964.5  TC(MIN.) =     45.17
  EFFECTIVE AREA(ACRES) =   1890.74  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.996
  PEAK FLOW RATE(CFS)   =    1378.13
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     1378.13   45.17    1.108  0.30( 0.30) 1.00    1890.7   10710.00
      2     1288.72   52.91    1.027  0.30( 0.30) 0.99    1964.5   10700.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S8.DAT
  TIME/DATE OF STUDY: 10:21 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.493
   2)   10.00;  2.912
   3)   15.00;  2.022
   4)   20.00;  1.738
   5)   25.00;  1.502
   6)   30.00;  1.327
   7)   40.00;  1.153
   8)   50.00;  1.034
   9)   60.00;  0.952
  10)   90.00;  0.809
  11)  120.00;  0.735
  12)  180.00;  0.627
  13)  360.00;  0.483
  14) 1440.00;  0.218
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10800.00 TO NODE  10801.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.93
  ELEVATION DATA: UPSTREAM(FEET) =   2617.19  DOWNSTREAM(FEET) =   2506.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.540
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.690
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.83      0.30     1.000     0    7.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.53
  TOTAL AREA(ACRES) =      0.83   PEAK FLOW RATE(CFS) =      2.53

**************************************************************************
  FLOW PROCESS FROM NODE  10801.00 TO NODE  10802.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2506.15  DOWNSTREAM(FEET) =   2237.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.01   CHANNEL SLOPE =  0.3968
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.20
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.953
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.84
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   2.33
  Tc(MIN.) =    9.87
  SUBAREA AREA(ACRES) =     5.30       SUBAREA RUNOFF(CFS) =   12.65
  EFFECTIVE AREA(ACRES) =      6.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =      14.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   5.83
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10802.00 =     925.94 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10802.00 TO NODE  10803.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2237.54  DOWNSTREAM(FEET) =   1920.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =   954.74   CHANNEL SLOPE =  0.3325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.44
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.552
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.40
  AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   12.02
  SUBAREA AREA(ACRES) =    18.25       SUBAREA RUNOFF(CFS) =   36.99
  EFFECTIVE AREA(ACRES) =     24.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.4         PEAK FLOW RATE(CFS) =      49.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   8.58
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10803.00 =    1880.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1920.11  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2201.18   CHANNEL SLOPE =  0.2865
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.999
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.99      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     110.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.83
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   3.39
  Tc(MIN.) =   15.41
  SUBAREA AREA(ACRES) =    78.99       SUBAREA RUNOFF(CFS) =  120.77
  EFFECTIVE AREA(ACRES) =    103.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      103.4         PEAK FLOW RATE(CFS) =     158.04
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =  12.15
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S6.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     5150.82   20.44  0.30( 0.30) 1.00    3094.8   10630.00
      2     5564.07   33.18  0.30( 0.30) 1.00    5039.0   10600.00
      3     5763.61   40.94  0.30( 0.30) 1.00    6244.3   10500.00
      4     5880.96   47.68  0.30( 0.30) 1.00    7219.3   10410.00
      5     6005.48   59.06  0.30( 0.30) 1.00    8662.6   10400.00
      6     5975.96   62.52  0.30( 0.30) 1.00    9036.4   10200.00
      7     5919.71   69.14  0.30( 0.30) 1.00    9655.8   10320.00
      8     5916.17   69.28  0.30( 0.30) 1.00    9665.6   10300.00
      9     5760.60   73.19  0.30( 0.30) 1.00    9818.0   10210.00
     10     4970.42  102.19  0.30( 0.30) 1.00   10538.0   10100.00
    TOTAL AREA(ACRES) =    10538.0

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S7.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1378.13   45.17  0.30( 0.30) 1.00    1890.7   10710.00
      2     1288.72   52.91  0.30( 0.30) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =     1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1378.13   45.17  0.30( 0.30) 1.00    1890.7   10710.00
```

```
      2     1288.72   52.91  0.30( 0.30) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =      1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1378.13   45.17    1.091  0.30( 0.30) 1.00    1890.7   10710.00
      2     1288.72   52.91    1.010  0.30( 0.30) 0.99    1964.5   10700.00
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5150.82   20.44    1.717  0.30( 0.30) 1.00    3094.8   10630.00
      2     5564.07   33.18    1.272  0.30( 0.30) 1.00    5039.0   10600.00
      3     5763.61   40.94    1.142  0.30( 0.30) 1.00    6244.3   10500.00
      4     5880.96   47.68    1.062  0.30( 0.30) 1.00    7219.3   10410.00
      5     6005.48   59.06    0.960  0.30( 0.30) 1.00    8662.6   10400.00
      6     5975.96   62.52    0.940  0.30( 0.30) 1.00    9036.4   10200.00
      7     5919.71   69.14    0.908  0.30( 0.30) 1.00    9655.8   10320.00
      8     5916.17   69.28    0.908  0.30( 0.30) 1.00    9665.6   10300.00
      9     5760.60   73.19    0.889  0.30( 0.30) 1.00    9818.0   10210.00
     10     4970.42  102.19    0.779  0.30( 0.30) 1.00   10538.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6266.57   20.44    1.717  0.30( 0.30) 1.00    3950.3   10630.00
      2     6806.47   33.18    1.272  0.30( 0.30) 1.00    6427.9   10600.00
      3     7091.95   40.94    1.142  0.30( 0.30) 1.00    7957.9   10500.00
      4     7215.43   45.17    1.091  0.30( 0.30) 1.00    8747.3   10710.00
      5     7230.11   47.68    1.062  0.30( 0.30) 1.00    9133.9   10410.00
      6     7226.90   52.91    1.010  0.30( 0.30) 1.00    9847.0   10700.00
      7     7202.91   59.06    0.960  0.30( 0.30) 1.00   10627.1   10400.00
      8     7137.61   62.52    0.940  0.30( 0.30) 1.00   11000.9   10200.00
      9     7024.25   69.14    0.908  0.30( 0.30) 1.00   11620.3   10320.00
     10     7019.49   69.28    0.908  0.30( 0.30) 1.00   11630.1   10300.00
     11     6830.25   73.19    0.889  0.30( 0.30) 1.00   11782.5   10210.00
     12     5840.57  102.19    0.779  0.30( 0.30) 1.00   12502.4   10100.00
    TOTAL AREA(ACRES) =     12502.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     7230.11  Tc(MIN.) =   47.678
  EFFECTIVE AREA(ACRES) =   9133.94  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12502.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10724.00 TO NODE  10820.00 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1320.32  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1341.06   CHANNEL SLOPE =  0.0231
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.64
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.041
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7246.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.76
  AVERAGE FLOW DEPTH(FEET) =   9.64   TRAVEL TIME(MIN.) =   1.75
  Tc(MIN.) =   49.43
  SUBAREA AREA(ACRES) =    47.66       SUBAREA RUNOFF(CFS) =   31.78
  EFFECTIVE AREA(ACRES) =   9181.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12550.1          PEAK FLOW RATE(CFS) =    7230.11
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.63   FLOW VELOCITY(FEET/SEC.) =  12.75
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6266.57   22.26    1.632  0.30( 0.30) 1.00    3997.9   10630.00
      2     6806.47   34.96    1.241  0.30( 0.30) 1.00    6475.6   10600.00
      3     7091.95   42.70    1.121  0.30( 0.30) 1.00    8005.5   10500.00
      4     7215.43   46.92    1.071  0.30( 0.30) 1.00    8794.9   10710.00
      5     7230.11   49.43    1.041  0.30( 0.30) 1.00    9181.6   10410.00
      6     7226.90   54.66    0.996  0.30( 0.30) 1.00    9894.7   10700.00
      7     7202.91   60.81    0.948  0.30( 0.30) 1.00   10674.8   10400.00
      8     7137.61   64.28    0.932  0.30( 0.30) 1.00   11048.5   10200.00
      9     7024.25   70.91    0.900  0.30( 0.30) 1.00   11667.9   10320.00
     10     7019.49   71.05    0.899  0.30( 0.30) 1.00   11677.8   10300.00
     11     6830.25   74.97    0.881  0.30( 0.30) 1.00   11830.1   10210.00
     12     5840.57  104.04    0.774  0.30( 0.30) 1.00   12550.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
      1      158.04   15.41    1.999  0.30( 0.30) 1.00     103.4   10800.00
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5693.13   15.41    1.999  0.30( 0.30) 1.00    2871.6   10800.00
      2     6390.45   22.26    1.632  0.30( 0.30) 1.00    4101.3   10630.00
      3     6893.99   34.96    1.241  0.30( 0.30) 1.00    6579.0   10600.00
      4     7168.33   42.70    1.121  0.30( 0.30) 1.00    8108.9   10500.00
      5     7287.13   46.92    1.071  0.30( 0.30) 1.00    8898.3   10710.00
      6     7299.03   49.43    1.041  0.30( 0.30) 1.00    9285.0   10410.00
      7     7291.64   54.66    0.996  0.30( 0.30) 1.00    9998.1   10700.00
      8     7263.22   60.81    0.948  0.30( 0.30) 1.00   10778.1   10400.00
      9     7196.38   64.28    0.932  0.30( 0.30) 1.00   11151.9   10200.00
     10     7080.08   70.91    0.900  0.30( 0.30) 1.00   11771.3   10320.00
     11     7075.25   71.05    0.899  0.30( 0.30) 1.00   11781.1   10300.00
     12     6884.28   74.97    0.881  0.30( 0.30) 1.00   11933.5   10210.00
     13     5884.71  104.04    0.774  0.30( 0.30) 1.00   12653.5   10100.00
    TOTAL AREA(ACRES) =     12653.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     7299.03  Tc(MIN.) =   49.431
  EFFECTIVE AREA(ACRES) =   9284.97  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12653.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1289.38  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2450.84   CHANNEL SLOPE =  0.0332
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.88
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.016
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7346.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.62
  AVERAGE FLOW DEPTH(FEET) =   8.88   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   52.23
  SUBAREA AREA(ACRES) =   147.19       SUBAREA RUNOFF(CFS) =   94.83
  EFFECTIVE AREA(ACRES) =   9432.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12800.7         PEAK FLOW RATE(CFS) =    7299.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.85
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.85   FLOW VELOCITY(FEET/SEC.) =  14.60
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   52.23
  RAINFALL INTENSITY(INCH/HR) =   1.02
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    9432.16
  TOTAL STREAM AREA(ACRES) =   12800.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    7299.03

****************************************************************************
  FLOW PROCESS FROM NODE  10830.00 TO NODE  10831.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.89
  ELEVATION DATA: UPSTREAM(FEET) =   3249.56  DOWNSTREAM(FEET) =   3166.67

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.939
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.248
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.88      0.30     1.000     0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.33
  TOTAL AREA(ACRES) =      0.88   PEAK FLOW RATE(CFS) =      2.33

****************************************************************************
  FLOW PROCESS FROM NODE  10831.00 TO NODE  10832.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3166.67  DOWNSTREAM(FEET) =   2954.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.65   CHANNEL SLOPE =  0.3126
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.545
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -        2.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.62
  AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =   3.12
  Tc(MIN.) =   12.06
  SUBAREA AREA(ACRES) =     2.82       SUBAREA RUNOFF(CFS) =    5.70
  EFFECTIVE AREA(ACRES) =      3.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =       7.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.17   FLOW VELOCITY(FEET/SEC.) =   4.19
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10832.00 =     977.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10832.00 TO NODE  10833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2954.84  DOWNSTREAM(FEET) =   2765.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.35   CHANNEL SLOPE =  0.1995
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.51
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.091
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       29.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.22
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   2.55
  Tc(MIN.) =   14.61
  SUBAREA AREA(ACRES) =    29.25       SUBAREA RUNOFF(CFS) =   47.16
  EFFECTIVE AREA(ACRES) =     32.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      53.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.63   FLOW VELOCITY(FEET/SEC.) =   7.48
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10833.00 =    1928.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10833.00 TO NODE  10834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2765.08  DOWNSTREAM(FEET) =   2446.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.29   CHANNEL SLOPE =  0.1628
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.836
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     109.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.91
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   3.67
  Tc(MIN.) =   18.28
  SUBAREA AREA(ACRES) =    80.66       SUBAREA RUNOFF(CFS) =  111.50
  EFFECTIVE AREA(ACRES) =    113.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.6         PEAK FLOW RATE(CFS) =     157.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) =  10.01
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10834.00 =    3888.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10834.00 TO NODE  10835.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2446.09  DOWNSTREAM(FEET) =   1797.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2083.04   CHANNEL SLOPE =  0.3113
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.710
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      196.68      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     282.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.05
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   2.31
  Tc(MIN.) =   20.58
  SUBAREA AREA(ACRES) =   196.68       SUBAREA RUNOFF(CFS) =  249.68
  EFFECTIVE AREA(ACRES) =    310.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      310.3         PEAK FLOW RATE(CFS) =     393.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.75
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.75   FLOW VELOCITY(FEET/SEC.) =  16.67
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10835.00 =    5971.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1797.70  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3213.25   CHANNEL SLOPE =  0.1835
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.38
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.542
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      218.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     516.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.99
  AVERAGE FLOW DEPTH(FEET) =   2.35   TRAVEL TIME(MIN.) =   3.57
  Tc(MIN.) =   24.16
  SUBAREA AREA(ACRES) =   218.82       SUBAREA RUNOFF(CFS) =  244.57
  EFFECTIVE AREA(ACRES) =    529.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      529.1         PEAK FLOW RATE(CFS) =     591.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.52   FLOW VELOCITY(FEET/SEC.) =  15.60
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10840.00 =    9184.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.16
  RAINFALL INTENSITY(INCH/HR) =   1.54
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     529.11
  TOTAL STREAM AREA(ACRES) =     529.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     591.38

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5693.13   18.39    1.829  0.30( 0.30) 1.00    3018.8   10800.00
      1     6390.45   25.15    1.497  0.30( 0.30) 1.00    4248.5   10630.00
      1     6893.99   37.80    1.191  0.30( 0.30) 1.00    6726.1   10600.00
      1     7168.33   45.51    1.087  0.30( 0.30) 1.00    8256.1   10500.00
      1     7287.13   49.72    1.037  0.30( 0.30) 1.00    9045.5   10710.00
      1     7299.03   52.23    1.016  0.30( 0.30) 1.00    9432.2   10410.00
      1     7291.64   57.45    0.973  0.30( 0.30) 1.00   10145.2   10700.00
      1     7263.22   63.61    0.935  0.30( 0.30) 1.00   10925.3   10400.00
      1     7196.38   67.09    0.918  0.30( 0.30) 1.00   11299.1   10200.00
      1     7080.08   73.73    0.887  0.30( 0.30) 1.00   11918.5   10320.00
      1     7075.25   73.87    0.886  0.30( 0.30) 1.00   11928.3   10300.00
      1     6884.28   77.80    0.867  0.30( 0.30) 1.00   12080.7   10210.00
      1     5884.71  107.00    0.767  0.30( 0.30) 1.00   12800.7   10100.00
      2      591.38   24.16    1.542  0.30( 0.30) 1.00     529.1   10830.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6247.63   18.39    1.829  0.30( 0.30) 1.00    3421.7   10800.00
      2     6879.58   24.16    1.542  0.30( 0.30) 1.00    4597.3   10830.00
      3     6960.42   25.15    1.497  0.30( 0.30) 1.00    4777.6   10630.00
      4     7318.47   37.80    1.191  0.30( 0.30) 1.00    7255.3   10600.00
      5     7543.36   45.51    1.087  0.30( 0.30) 1.00    8785.2   10500.00
      6     7638.29   49.72    1.037  0.30( 0.30) 1.00    9574.6   10710.00
      7     7639.91   52.23    1.016  0.30( 0.30) 1.00    9961.3   10410.00
      8     7612.09   57.45    0.973  0.30( 0.30) 1.00   10674.4   10700.00
      9     7565.54   63.61    0.935  0.30( 0.30) 1.00   11454.4   10400.00
     10     7490.81   67.09    0.918  0.30( 0.30) 1.00   11828.2   10200.00
     11     7359.44   73.73    0.887  0.30( 0.30) 1.00   12447.6   10320.00
     12     7354.29   73.87    0.886  0.30( 0.30) 1.00   12457.4   10300.00
     13     7154.38   77.80    0.867  0.30( 0.30) 1.00   12609.8   10210.00
     14     6107.15  107.00    0.767  0.30( 0.30) 1.00   13329.8   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    7639.91    Tc(MIN.) =    52.23
  EFFECTIVE AREA(ACRES) =    9961.27   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    13329.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10840.00 TO NODE  10841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1208.07  DOWNSTREAM(FEET) =   1119.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3050.12   CHANNEL SLOPE =  0.0292
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.986
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      222.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7708.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.14
  AVERAGE FLOW DEPTH(FEET) =   9.38   TRAVEL TIME(MIN.) =   3.60
  Tc(MIN.) =   55.82
  SUBAREA AREA(ACRES) =   222.84       SUBAREA RUNOFF(CFS) =  137.65
  EFFECTIVE AREA(ACRES) =  10184.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13552.6         PEAK FLOW RATE(CFS) =    7639.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.34   FLOW VELOCITY(FEET/SEC.) =  14.11
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10841.00 =   52177.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1119.03  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.14   CHANNEL SLOPE =  0.0238
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.88
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.973
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      265.26      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7720.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.12
  AVERAGE FLOW DEPTH(FEET) =   9.87   TRAVEL TIME(MIN.) =   1.67
  Tc(MIN.) =   57.50
  SUBAREA AREA(ACRES) =   265.26       SUBAREA RUNOFF(CFS) =  160.57
  EFFECTIVE AREA(ACRES) =  10449.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13817.9         PEAK FLOW RATE(CFS) =    7639.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.82   FLOW VELOCITY(FEET/SEC.) =  13.08
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =   1
```



```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   57.50
  RAINFALL INTENSITY(INCH/HR) =   0.97
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   10449.37
  TOTAL STREAM AREA(ACRES) =   13817.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    7639.91

****************************************************************************
  FLOW PROCESS FROM NODE  10850.00 TO NODE  10851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   311.88
  ELEVATION DATA: UPSTREAM(FEET) =   3029.66  DOWNSTREAM(FEET) =   2922.38

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.691
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.326
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.73      0.30     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.43
  TOTAL AREA(ACRES) =      2.73   PEAK FLOW RATE(CFS) =      7.43

****************************************************************************
  FLOW PROCESS FROM NODE  10851.00 TO NODE  10852.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2922.38  DOWNSTREAM(FEET) =   2684.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =   687.05   CHANNEL SLOPE =  0.3461
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.765
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -        5.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.37
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =   10.82
```

```
  SUBAREA AREA(ACRES) =     5.11       SUBAREA RUNOFF(CFS) =   11.34
  EFFECTIVE AREA(ACRES) =      7.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      17.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   5.94
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10852.00 =     998.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10852.00 TO NODE  10853.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2684.61  DOWNSTREAM(FEET) =   2306.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.58   CHANNEL SLOPE =  0.1966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.053
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      66.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.02
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   4.00
  Tc(MIN.) =   14.82
  SUBAREA AREA(ACRES) =    60.02       SUBAREA RUNOFF(CFS) =   94.71
  EFFECTIVE AREA(ACRES) =     67.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =     107.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   9.46
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10853.00 =    2923.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10853.00 TO NODE  10854.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2306.25  DOWNSTREAM(FEET) =   1555.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3225.53   CHANNEL SLOPE =  0.2329
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.61
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.804
```



```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      235.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     267.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.39
  AVERAGE FLOW DEPTH(FEET) =   1.53   TRAVEL TIME(MIN.) =   4.01
  Tc(MIN.) =   18.84
  SUBAREA AREA(ACRES) =   235.82       SUBAREA RUNOFF(CFS) =  319.21
  EFFECTIVE AREA(ACRES) =    303.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.7         PEAK FLOW RATE(CFS) =     411.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.94   FLOW VELOCITY(FEET/SEC.) =  15.26
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10854.00 =    6149.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1555.12  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3294.22   CHANNEL SLOPE =  0.1419
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.67
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.608
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      247.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     557.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.99
  AVERAGE FLOW DEPTH(FEET) =   2.61   TRAVEL TIME(MIN.) =   3.92
  Tc(MIN.) =   22.76
  SUBAREA AREA(ACRES) =   247.64       SUBAREA RUNOFF(CFS) =  291.45
  EFFECTIVE AREA(ACRES) =    551.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      551.3         PEAK FLOW RATE(CFS) =     648.85
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.84   FLOW VELOCITY(FEET/SEC.) =  14.60
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10860.00 =    9443.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =   1
```

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--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.76
  RAINFALL INTENSITY(INCH/HR) =   1.61
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     551.32
  TOTAL STREAM AREA(ACRES) =     551.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     648.85

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     6247.63   23.94    1.552  0.30( 0.30) 1.00    3909.8   10800.00
      1     6879.58   29.57    1.342  0.30( 0.30) 1.00    5085.4   10830.00
      1     6960.42   30.54    1.318  0.30( 0.30) 1.00    5265.7   10630.00
      1     7318.47   43.13    1.116  0.30( 0.30) 1.00    7743.4   10600.00
      1     7543.36   50.79    1.027  0.30( 0.30) 1.00    9273.3   10500.00
      1     7638.29   54.99    0.993  0.30( 0.30) 1.00   10062.7   10710.00
      1     7639.91   57.50    0.973  0.30( 0.30) 1.00   10449.4   10410.00
      1     7612.09   62.73    0.939  0.30( 0.30) 1.00   11162.5   10700.00
      1     7565.54   68.90    0.910  0.30( 0.30) 1.00   11942.5   10400.00
      1     7490.81   72.39    0.893  0.30( 0.30) 1.00   12316.3   10200.00
      1     7359.44   79.05    0.861  0.30( 0.30) 1.00   12935.7   10320.00
      1     7354.29   79.20    0.861  0.30( 0.30) 1.00   12945.5   10300.00
      1     7154.38   83.17    0.842  0.30( 0.30) 1.00   13097.9   10210.00
      1     6107.15  112.61    0.753  0.30( 0.30) 1.00   13817.9   10100.00
      2      648.85   22.76    1.608  0.30( 0.30) 1.00     551.3   10850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     6852.82   22.76    1.608  0.30( 0.30) 1.00    4268.9   10850.00
      2     6868.93   23.94    1.552  0.30( 0.30) 1.00    4461.1   10800.00
      3     7396.70   29.57    1.342  0.30( 0.30) 1.00    5636.7   10830.00
      4     7465.36   30.54    1.318  0.30( 0.30) 1.00    5817.0   10630.00
      5     7723.28   43.13    1.116  0.30( 0.30) 1.00    8294.7   10600.00
      6     7904.36   50.79    1.027  0.30( 0.30) 1.00    9824.6   10500.00
      7     7982.22   54.99    0.993  0.30( 0.30) 1.00   10614.0   10710.00
      8     7973.65   57.50    0.973  0.30( 0.30) 1.00   11000.7   10410.00
      9     7929.18   62.73    0.939  0.30( 0.30) 1.00   11713.8   10700.00
     10     7868.05   68.90    0.910  0.30( 0.30) 1.00   12493.8   10400.00
     11     7785.06   72.39    0.893  0.30( 0.30) 1.00   12867.6   10200.00
     12     7637.92   79.05    0.861  0.30( 0.30) 1.00   13487.0   10320.00
     13     7632.44   79.20    0.861  0.30( 0.30) 1.00   13496.9   10300.00
     14     7423.12   83.17    0.842  0.30( 0.30) 1.00   13649.2   10210.00
     15     6332.08  112.61    0.753  0.30( 0.30) 1.00   14369.2   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    7982.22    Tc(MIN.) =    54.99
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  EFFECTIVE AREA(ACRES) =   10614.01   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    14369.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1087.70  DOWNSTREAM(FEET) =    961.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4791.22   CHANNEL SLOPE =  0.0264
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.87
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.948
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      402.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    8099.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.82
  AVERAGE FLOW DEPTH(FEET) =   9.85   TRAVEL TIME(MIN.) =   5.78
  Tc(MIN.) =   60.77
  SUBAREA AREA(ACRES) =   402.51       SUBAREA RUNOFF(CFS) =  234.89
  EFFECTIVE AREA(ACRES) =  11016.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    14771.7          PEAK FLOW RATE(CFS) =    7982.22
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.78   FLOW VELOCITY(FEET/SEC.) =  13.76
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    14771.7  TC(MIN.) =     60.77
  EFFECTIVE AREA(ACRES) =  11016.52  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    7982.22

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     6852.82   28.76    1.370  0.30( 0.30) 1.00    4671.4   10850.00
      2     6868.93   29.94    1.329  0.30( 0.30) 1.00    4863.6   10800.00
      3     7396.70   35.46    1.232  0.30( 0.30) 1.00    6039.2   10830.00
      4     7465.36   36.42    1.215  0.30( 0.30) 1.00    6219.5   10630.00
      5     7723.28   48.95    1.046  0.30( 0.30) 1.00    8697.2   10600.00
      6     7904.36   56.59    0.980  0.30( 0.30) 1.00   10227.1   10500.00
      7     7982.22   60.77    0.948  0.30( 0.30) 1.00   11016.5   10710.00
      8     7973.65   63.28    0.936  0.30( 0.30) 1.00   11403.2   10410.00
      9     7929.18   68.52    0.911  0.30( 0.30) 1.00   12116.3   10700.00
```

10	7868.05	74.70	0.882	0.30(0.30)	1.00	12896.4	10400.00
11	7785.06	78.21	0.865	0.30(0.30)	1.00	13270.1	10200.00
12	7637.92	84.90	0.833	0.30(0.30)	1.00	13889.5	10320.00
13	7632.44	85.05	0.833	0.30(0.30)	1.00	13899.4	10300.00
14	7423.12	89.07	0.813	0.30(0.30)	1.00	14051.7	10210.00
15	6332.08	118.76	0.738	0.30(0.30)	1.00	14771.7	10100.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S9.DAT
  TIME/DATE OF STUDY: 10:22 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.493
   2)   10.00;  2.912
   3)   15.00;  2.022
   4)   20.00;  1.738
   5)   25.00;  1.502
   6)   30.00;  1.327
   7)   40.00;  1.153
   8)   50.00;  1.034
   9)   60.00;  0.952
  10)   90.00;  0.809
  11)  120.00;  0.735
  12)  180.00;  0.627
  13)  360.00;  0.483
  14) 1440.00;  0.218
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10900.00 TO NODE  10901.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   305.17
  ELEVATION DATA: UPSTREAM(FEET) =   3291.76  DOWNSTREAM(FEET) =   3104.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.671
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.648
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.19      0.30     1.000      0    7.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.59
  TOTAL AREA(ACRES) =      1.19   PEAK FLOW RATE(CFS) =      3.59

************************************************************************
  FLOW PROCESS FROM NODE  10901.00 TO NODE  10902.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3104.08  DOWNSTREAM(FEET) =   2877.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   666.71   CHANNEL SLOPE =  0.3398
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.840
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        2.53      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.06
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   10.41
  SUBAREA AREA(ACRES) =     2.53       SUBAREA RUNOFF(CFS) =    5.78
  EFFECTIVE AREA(ACRES) =      3.72     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =       8.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   4.55
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10902.00 =     971.88 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10902.00 TO NODE  10903.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2877.50  DOWNSTREAM(FEET) =   2643.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.39   CHANNEL SLOPE =  0.1219
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.957
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.57
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   5.73
  Tc(MIN.) =   16.14
  SUBAREA AREA(ACRES) =    36.43       SUBAREA RUNOFF(CFS) =   54.34
  EFFECTIVE AREA(ACRES) =     40.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.2         PEAK FLOW RATE(CFS) =      59.89
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   6.61
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10903.00 =    2888.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10903.00 TO NODE  10904.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2643.95  DOWNSTREAM(FEET) =   2373.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.90   CHANNEL SLOPE =  0.1400
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.30
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.761
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     144.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.29
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   19.60
  SUBAREA AREA(ACRES) =   129.07       SUBAREA RUNOFF(CFS) =  169.67
  EFFECTIVE AREA(ACRES) =    169.22     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      169.2         PEAK FLOW RATE(CFS) =     222.45
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.59   FLOW VELOCITY(FEET/SEC.) =  10.62
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10904.00 =    4820.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10904.00 TO NODE  10905.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2373.49  DOWNSTREAM(FEET) =   1817.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2764.66   CHANNEL SLOPE =  0.2010
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.590
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     290.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.08
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   3.52
  Tc(MIN.) =   23.13
  SUBAREA AREA(ACRES) =   117.70       SUBAREA RUNOFF(CFS) =  136.70
  EFFECTIVE AREA(ACRES) =    286.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.9         PEAK FLOW RATE(CFS) =     333.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.80   FLOW VELOCITY(FEET/SEC.) =  13.63
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10905.00 =    7584.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10905.00 TO NODE  10906.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1817.76  DOWNSTREAM(FEET) =   1387.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2799.36   CHANNEL SLOPE =  0.1536
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.53
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.452
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      363.93      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     522.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.11
  AVERAGE FLOW DEPTH(FEET) =   2.47   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   26.43
  SUBAREA AREA(ACRES) =   363.93       SUBAREA RUNOFF(CFS) =  377.29
  EFFECTIVE AREA(ACRES) =    650.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.8          PEAK FLOW RATE(CFS) =     674.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.83   FLOW VELOCITY(FEET/SEC.) =  15.20
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10906.00 =   10384.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1387.73  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2484.63   CHANNEL SLOPE =  0.1103
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.346
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     701.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.64
  AVERAGE FLOW DEPTH(FEET) =   3.15   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   29.47
  SUBAREA AREA(ACRES) =    56.85       SUBAREA RUNOFF(CFS) =   53.50
  EFFECTIVE AREA(ACRES) =    707.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      707.7          PEAK FLOW RATE(CFS) =     674.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.09   FLOW VELOCITY(FEET/SEC.) =  13.48
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10920.00 =   12868.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
```



```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.47
  RAINFALL INTENSITY(INCH/HR) =   1.35
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     707.70
  TOTAL STREAM AREA(ACRES) =     707.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     674.75

****************************************************************************
  FLOW PROCESS FROM NODE  10910.00 TO NODE  10911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   287.29
  ELEVATION DATA: UPSTREAM(FEET) =   3119.43  DOWNSTREAM(FEET) =   3044.59

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.891
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.263
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.91      0.30     1.000     0    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.09
  TOTAL AREA(ACRES) =      1.91   PEAK FLOW RATE(CFS) =      5.09

****************************************************************************
  FLOW PROCESS FROM NODE  10911.00 TO NODE  10912.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3044.59  DOWNSTREAM(FEET) =   2980.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.50   CHANNEL SLOPE =  0.1015
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.30
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.524
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.18
  AVERAGE FLOW DEPTH(FEET) =   0.28   TRAVEL TIME(MIN.) =   3.29
  Tc(MIN.) =   12.18
  SUBAREA AREA(ACRES) =     4.16       SUBAREA RUNOFF(CFS) =    8.33
  EFFECTIVE AREA(ACRES) =      6.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =      12.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   3.53
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10912.00 =     914.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10912.00 TO NODE  10913.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2980.93  DOWNSTREAM(FEET) =   2876.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =   984.99   CHANNEL SLOPE =  0.1065
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.59
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.995
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.86      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.97
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   15.48
  SUBAREA AREA(ACRES) =    22.86       SUBAREA RUNOFF(CFS) =   34.87
  EFFECTIVE AREA(ACRES) =     28.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.9         PEAK FLOW RATE(CFS) =      44.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   5.69
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10913.00 =    1899.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10913.00 TO NODE  10914.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2876.01  DOWNSTREAM(FEET) =   2832.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   939.99   CHANNEL SLOPE =  0.0465
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.826
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       53.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      80.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.28
  AVERAGE FLOW DEPTH(FEET) =   1.23   TRAVEL TIME(MIN.) =   2.97
  Tc(MIN.) =   18.45
  SUBAREA AREA(ACRES) =    53.02       SUBAREA RUNOFF(CFS) =   72.83
  EFFECTIVE AREA(ACRES) =     81.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       81.9         PEAK FLOW RATE(CFS) =     112.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   5.88
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10914.00 =    2839.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10914.00 TO NODE  10915.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2832.29  DOWNSTREAM(FEET) =   2769.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1006.52   CHANNEL SLOPE =  0.0623
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.74
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.704
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.80      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     169.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.39
  AVERAGE FLOW DEPTH(FEET) =   1.71   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   20.72
  SUBAREA AREA(ACRES) =    90.80       SUBAREA RUNOFF(CFS) =  114.75
  EFFECTIVE AREA(ACRES) =    172.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      172.8         PEAK FLOW RATE(CFS) =     218.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.97   FLOW VELOCITY(FEET/SEC.) =   7.94
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10915.00 =    3846.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10915.00 TO NODE  10916.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

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==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2769.58  DOWNSTREAM(FEET) =   2453.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3003.36   CHANNEL SLOPE =  0.1053
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.42
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.497
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      311.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     386.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.33
  AVERAGE FLOW DEPTH(FEET) =   2.33   TRAVEL TIME(MIN.) =   4.42
  Tc(MIN.) =   25.14
  SUBAREA AREA(ACRES) =   311.96       SUBAREA RUNOFF(CFS) =  336.14
  EFFECTIVE AREA(ACRES) =    484.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      484.7         PEAK FLOW RATE(CFS) =     522.28
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.73   FLOW VELOCITY(FEET/SEC.) =  12.35
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10916.00 =    6849.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10916.00 TO NODE  10917.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.21  DOWNSTREAM(FEET) =   1787.18
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2846.14   CHANNEL SLOPE =  0.2340
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.402
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     640.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.39
  AVERAGE FLOW DEPTH(FEET) =   2.47   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   27.87
  SUBAREA AREA(ACRES) =   238.62       SUBAREA RUNOFF(CFS) =  236.61
  EFFECTIVE AREA(ACRES) =    723.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      723.3         PEAK FLOW RATE(CFS) =     717.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.62
```



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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.62   FLOW VELOCITY(FEET/SEC.) =  17.97
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10917.00 =    9695.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10917.00 TO NODE  10918.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1787.18  DOWNSTREAM(FEET) =   1279.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2918.23   CHANNEL SLOPE =  0.1741
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.99
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.313
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      150.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     785.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.60
  AVERAGE FLOW DEPTH(FEET) =   2.97   TRAVEL TIME(MIN.) =   2.93
  Tc(MIN.) =   30.80
  SUBAREA AREA(ACRES) =   150.63       SUBAREA RUNOFF(CFS) =  137.36
  EFFECTIVE AREA(ACRES) =    873.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      874.0         PEAK FLOW RATE(CFS) =     796.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.99   FLOW VELOCITY(FEET/SEC.) =  16.65
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10918.00 =   12614.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1279.22  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.50   CHANNEL SLOPE =  0.0995
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.52
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.278
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     823.42
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.73
  AVERAGE FLOW DEPTH(FEET) =   3.52   TRAVEL TIME(MIN.) =   2.02
  Tc(MIN.) =   32.82
  SUBAREA AREA(ACRES) =    60.16       SUBAREA RUNOFF(CFS) =   52.95
  EFFECTIVE AREA(ACRES) =    934.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      934.1         PEAK FLOW RATE(CFS) =     822.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.51   FLOW VELOCITY(FEET/SEC.) =  13.74
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   32.82
  RAINFALL INTENSITY(INCH/HR) =   1.28
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     934.12
  TOTAL STREAM AREA(ACRES) =     934.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     822.24

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      674.75   29.47    1.346  0.30( 0.30) 1.00     707.7   10900.00
      2      822.24   32.82    1.278  0.30( 0.30) 1.00     934.1   10910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1464.13   29.47    1.346  0.30( 0.30) 1.00    1546.5   10900.00
      2     1453.36   32.82    1.278  0.30( 0.30) 1.00    1641.8   10910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1464.13    Tc(MIN.) =    29.47
  EFFECTIVE AREA(ACRES) =    1546.49   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1641.8
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



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  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1113.60  DOWNSTREAM(FEET) =    961.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2282.16   CHANNEL SLOPE =  0.0668
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.289
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      185.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1546.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.05
  AVERAGE FLOW DEPTH(FEET) =   5.33   TRAVEL TIME(MIN.) =   2.71
  Tc(MIN.) =   32.18
  SUBAREA AREA(ACRES) =   185.67       SUBAREA RUNOFF(CFS) =  165.30
  EFFECTIVE AREA(ACRES) =   1732.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1827.5         PEAK FLOW RATE(CFS) =    1542.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.32   FLOW VELOCITY(FEET/SEC.) =  14.04
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10921.00 =   16560.68 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1827.5  TC(MIN.) =     32.18
  EFFECTIVE AREA(ACRES) =   1732.16  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1542.13

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1542.13   32.18    1.289  0.30( 0.30) 1.00    1732.2   10900.00
      2     1531.00   35.53    1.231  0.30( 0.30) 1.00    1827.5   10910.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                         Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S10.DAT
  TIME/DATE OF STUDY: 10:22 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.379
   2)   10.00;  2.849
   3)   15.00;  1.997
   4)   20.00;  1.715
   5)   25.00;  1.485
   6)   30.00;  1.315
   7)   40.00;  1.140
   8)   50.00;  1.021
   9)   60.00;  0.937
  10)   90.00;  0.794
  11)  120.00;  0.718
  12)  180.00;  0.611
  13)  360.00;  0.468
  14) 1440.00;  0.210
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11000.00 TO NODE  11001.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   362.38
  ELEVATION DATA: UPSTREAM(FEET) =   2528.19  DOWNSTREAM(FEET) =   2375.55

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.863
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.197
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        2.03      0.30     1.000      0    8.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.29
  TOTAL AREA(ACRES) =      2.03   PEAK FLOW RATE(CFS) =      5.29

**************************************************************************
  FLOW PROCESS FROM NODE  11001.00 TO NODE  11002.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2375.55  DOWNSTREAM(FEET) =   2005.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.45   CHANNEL SLOPE =  0.6438
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.744
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        3.14      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.47
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   1.75
  Tc(MIN.) =   10.62
  SUBAREA AREA(ACRES) =     3.14       SUBAREA RUNOFF(CFS) =    6.91
  EFFECTIVE AREA(ACRES) =      5.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2          PEAK FLOW RATE(CFS) =      11.37
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   6.16
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11002.00 =     937.83 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11002.00 TO NODE  11003.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2005.09  DOWNSTREAM(FEET) =   1450.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.43   CHANNEL SLOPE =  0.5763
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.413
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.25
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   1.94
  Tc(MIN.) =   12.56
  SUBAREA AREA(ACRES) =    16.53       SUBAREA RUNOFF(CFS) =   31.44
  EFFECTIVE AREA(ACRES) =     21.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.7         PEAK FLOW RATE(CFS) =      41.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   9.56
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11003.00 =    1900.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.44  DOWNSTREAM(FEET) =    939.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1351.71   CHANNEL SLOPE =  0.3779
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.024
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.99      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.88
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =   14.84
  SUBAREA AREA(ACRES) =    30.99       SUBAREA RUNOFF(CFS) =   48.10
  EFFECTIVE AREA(ACRES) =     52.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       52.7         PEAK FLOW RATE(CFS) =      81.78
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =  10.69
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S8.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     6852.82   28.76  0.30( 0.30) 1.00    4671.4   10850.00
      2     6868.93   29.94  0.30( 0.30) 1.00    4863.6   10800.00
      3     7396.70   35.46  0.30( 0.30) 1.00    6039.2   10830.00
      4     7465.36   36.42  0.30( 0.30) 1.00    6219.5   10630.00
      5     7723.28   48.95  0.30( 0.30) 1.00    8697.2   10600.00
      6     7904.36   56.59  0.30( 0.30) 1.00   10227.1   10500.00
      7     7982.22   60.77  0.30( 0.30) 1.00   11016.5   10710.00
      8     7973.65   63.28  0.30( 0.30) 1.00   11403.2   10410.00
      9     7929.18   68.52  0.30( 0.30) 1.00   12116.3   10700.00
     10     7868.05   74.70  0.30( 0.30) 1.00   12896.4   10400.00
     11     7785.06   78.21  0.30( 0.30) 1.00   13270.1   10200.00
     12     7637.92   84.90  0.30( 0.30) 1.00   13889.5   10320.00
     13     7632.44   85.05  0.30( 0.30) 1.00   13899.4   10300.00
     14     7423.12   89.07  0.30( 0.30) 1.00   14051.7   10210.00
     15     6332.08  118.76  0.30( 0.30) 1.00   14771.7   10100.00
    TOTAL AREA(ACRES) =    14771.7

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S9.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1542.13   32.18  0.30( 0.30) 1.00    1732.2   10900.00
      2     1531.00   35.53  0.30( 0.30) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =     1827.5

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================
```

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1542.13	32.18	0.30(0.30)	1.00	1732.2	10900.00
2	1531.00	35.53	0.30(0.30)	1.00	1827.5	10910.00

TOTAL AREA(ACRES) = 1827.5

****

FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1542.13	32.18	1.277	0.30(0.30)	1.00	1732.2	10900.00
2	1531.00	35.53	1.218	0.30(0.30)	1.00	1827.5	10910.00

LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6852.82	28.76	1.357	0.30(0.30)	1.00	4671.4	10850.00
2	6868.93	29.94	1.317	0.30(0.30)	1.00	4863.6	10800.00
3	7396.70	35.46	1.220	0.30(0.30)	1.00	6039.2	10830.00
4	7465.36	36.42	1.203	0.30(0.30)	1.00	6219.5	10630.00
5	7723.28	48.95	1.033	0.30(0.30)	1.00	8697.2	10600.00
6	7904.36	56.59	0.966	0.30(0.30)	1.00	10227.1	10500.00
7	7982.22	60.77	0.933	0.30(0.30)	1.00	11016.5	10710.00
8	7973.65	63.28	0.921	0.30(0.30)	1.00	11403.2	10410.00
9	7929.18	68.52	0.896	0.30(0.30)	1.00	12116.3	10700.00
10	7868.05	74.70	0.867	0.30(0.30)	1.00	12896.4	10400.00
11	7785.06	78.21	0.850	0.30(0.30)	1.00	13270.1	10200.00
12	7637.92	84.90	0.818	0.30(0.30)	1.00	13889.5	10320.00
13	7632.44	85.05	0.818	0.30(0.30)	1.00	13899.4	10300.00
14	7423.12	89.07	0.798	0.30(0.30)	1.00	14051.7	10210.00
15	6332.08	118.76	0.721	0.30(0.30)	1.00	14771.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8344.47	28.76	1.357	0.30(0.30)	1.00	6219.9	10850.00
2	8362.84	29.94	1.317	0.30(0.30)	1.00	6475.4	10800.00
3	8624.90	32.18	1.277	0.30(0.30)	1.00	7072.1	10900.00
4	8927.94	35.46	1.220	0.30(0.30)	1.00	7864.6	10830.00
5	8932.96	35.53	1.218	0.30(0.30)	1.00	7880.5	10910.00
6	8970.50	36.42	1.203	0.30(0.30)	1.00	8047.0	10630.00
7	8946.21	48.95	1.033	0.30(0.30)	1.00	10524.7	10600.00
8	9014.24	56.59	0.966	0.30(0.30)	1.00	12054.6	10500.00
9	9038.24	60.77	0.933	0.30(0.30)	1.00	12844.0	10710.00
10	9009.74	63.28	0.921	0.30(0.30)	1.00	13230.7	10410.00
11	8923.57	68.52	0.896	0.30(0.30)	1.00	13943.8	10700.00
12	8813.37	74.70	0.867	0.30(0.30)	1.00	14723.8	10400.00
13	8702.48	78.21	0.850	0.30(0.30)	1.00	15097.6	10200.00
14	8502.14	84.90	0.818	0.30(0.30)	1.00	15717.0	10320.00

15	8495.51	85.05	0.818	0.30(0.30)	1.00	15726.9	10300.00
16	8254.23	89.07	0.798	0.30(0.30)	1.00	15879.2	10210.00
17	7034.31	118.76	0.721	0.30(0.30)	1.00	16599.2	10100.00

TOTAL AREA(ACRES) = 16599.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9038.24 Tc(MIN.) = 60.770

EFFECTIVE AREA(ACRES) = 12844.01 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 16599.2

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

****

FLOW PROCESS FROM NODE 10921.00 TO NODE 11020.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 961.06 DOWNSTREAM(FEET) = 939.63

CHANNEL LENGTH THRU SUBAREA(FEET) = 601.65 CHANNEL SLOPE = 0.0356

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050

*ESTIMATED CHANNEL HEIGHT(FEET) = 8.83

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.931

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.29	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9043.43

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.13

AVERAGE FLOW DEPTH(FEET) = 8.83 TRAVEL TIME(MIN.) = 0.55

Tc(MIN.) = 61.32

SUBAREA AREA(ACRES) = 18.29 SUBAREA RUNOFF(CFS) = 10.38

EFFECTIVE AREA(ACRES) = 12862.30 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 16617.5 PEAK FLOW RATE(CFS) = 9038.24

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050

*ESTIMATED CHANNEL HEIGHT(FEET) = 8.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.83 FLOW VELOCITY(FEET/SEC.) = 18.12

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

****

FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8344.47	29.33	1.338	0.30(0.30)	1.00	6238.2	10850.00
2	8362.84	30.51	1.306	0.30(0.30)	1.00	6493.7	10800.00

```
      3     8624.90   32.74    1.267  0.30( 0.30) 1.00    7090.4   10900.00
      4     8927.94   36.01    1.210  0.30( 0.30) 1.00    7882.9   10830.00
      5     8932.96   36.08    1.209  0.30( 0.30) 1.00    7898.8   10910.00
      6     8970.50   36.97    1.193  0.30( 0.30) 1.00    8065.3   10630.00
      7     8946.21   49.51    1.027  0.30( 0.30) 1.00   10543.0   10600.00
      8     9014.24   57.14    0.961  0.30( 0.30) 1.00   12072.9   10500.00
      9     9038.24   61.32    0.931  0.30( 0.30) 1.00   12862.3   10710.00
     10     9009.74   63.83    0.919  0.30( 0.30) 1.00   13249.0   10410.00
     11     8923.57   69.08    0.894  0.30( 0.30) 1.00   13962.1   10700.00
     12     8813.37   75.26    0.864  0.30( 0.30) 1.00   14742.1   10400.00
     13     8702.48   78.77    0.848  0.30( 0.30) 1.00   15115.9   10200.00
     14     8502.14   85.47    0.816  0.30( 0.30) 1.00   15735.3   10320.00
     15     8495.51   85.61    0.815  0.30( 0.30) 1.00   15745.1   10300.00
     16     8254.23   89.64    0.796  0.30( 0.30) 1.00   15897.5   10210.00
     17     7034.31  119.36    0.720  0.30( 0.30) 1.00   16617.5   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       81.78   14.84    2.024  0.30( 0.30) 1.00      52.7   11000.00
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7096.15   14.84    2.024  0.30( 0.30) 1.00    3208.9   11000.00
      2     8393.69   29.33    1.338  0.30( 0.30) 1.00    6290.9   10850.00
      3     8410.55   30.51    1.306  0.30( 0.30) 1.00    6546.4   10800.00
      4     8670.77   32.74    1.267  0.30( 0.30) 1.00    7143.1   10900.00
      5     8971.09   36.01    1.210  0.30( 0.30) 1.00    7935.6   10830.00
      6     8976.04   36.08    1.209  0.30( 0.30) 1.00    7951.5   10910.00
      7     9012.86   36.97    1.193  0.30( 0.30) 1.00    8118.0   10630.00
      8     8980.68   49.51    1.027  0.30( 0.30) 1.00   10595.7   10600.00
      9     9045.59   57.14    0.961  0.30( 0.30) 1.00   12125.6   10500.00
     10     9068.15   61.32    0.931  0.30( 0.30) 1.00   12915.0   10710.00
     11     9039.09   63.83    0.919  0.30( 0.30) 1.00   13301.7   10410.00
     12     8951.73   69.08    0.894  0.30( 0.30) 1.00   14014.8   10700.00
     13     8840.13   75.26    0.864  0.30( 0.30) 1.00   14794.8   10400.00
     14     8728.45   78.77    0.848  0.30( 0.30) 1.00   15168.6   10200.00
     15     8526.59   85.47    0.816  0.30( 0.30) 1.00   15788.0   10320.00
     16     8519.93   85.61    0.815  0.30( 0.30) 1.00   15797.8   10300.00
     17     8277.74   89.64    0.796  0.30( 0.30) 1.00   15950.2   10210.00
     18     7054.21  119.36    0.720  0.30( 0.30) 1.00   16670.2   10100.00
    TOTAL AREA(ACRES) =     16670.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     9068.15  Tc(MIN.) =   61.323
  EFFECTIVE AREA(ACRES) =  12915.00  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    16670.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11020.00 TO NODE  11021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.63  DOWNSTREAM(FEET) =    865.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2876.19   CHANNEL SLOPE =  0.0259
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.60
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.917
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9121.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.17
  AVERAGE FLOW DEPTH(FEET) =   9.59   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   64.29
  SUBAREA AREA(ACRES) =   191.02       SUBAREA RUNOFF(CFS) =  106.01
  EFFECTIVE AREA(ACRES) =  13106.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    16861.2         PEAK FLOW RATE(CFS) =    9068.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.57   FLOW VELOCITY(FEET/SEC.) =  16.14
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11021.00 =   61764.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11021.00 TO NODE  11022.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    865.22  DOWNSTREAM(FEET) =    752.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.47   CHANNEL SLOPE =  0.0389
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.904
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9155.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.80
  AVERAGE FLOW DEPTH(FEET) =   8.69   TRAVEL TIME(MIN.) =   2.56
  Tc(MIN.) =   66.85
  SUBAREA AREA(ACRES) =   320.06       SUBAREA RUNOFF(CFS) =  174.10
  EFFECTIVE AREA(ACRES) =  13426.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17181.2         PEAK FLOW RATE(CFS) =    9068.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.65   FLOW VELOCITY(FEET/SEC.) =  18.74
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11022.00 =   64657.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11022.00 TO NODE  11023.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    752.60  DOWNSTREAM(FEET) =    737.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.15   CHANNEL SLOPE =  0.0081
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.890
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      226.98      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9128.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.56
  AVERAGE FLOW DEPTH(FEET) =  12.70   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   69.79
  SUBAREA AREA(ACRES) =   226.98       SUBAREA RUNOFF(CFS) =  121.46
  EFFECTIVE AREA(ACRES) =  13653.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17408.2         PEAK FLOW RATE(CFS) =    9068.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.66   FLOW VELOCITY(FEET/SEC.) =  10.54
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11023.00 =   66521.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    737.50  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2632.50   CHANNEL SLOPE =  0.0222
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.95
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.877
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.84      0.30     0.992     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9100.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.29
  AVERAGE FLOW DEPTH(FEET) =   9.95   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   72.66
  SUBAREA AREA(ACRES) =   124.84       SUBAREA RUNOFF(CFS) =   65.07
  EFFECTIVE AREA(ACRES) =  13777.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17533.1         PEAK FLOW RATE(CFS) =    9068.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.93   FLOW VELOCITY(FEET/SEC.) =  15.28
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11363.00 =   69154.02 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    17533.1  TC(MIN.) =     72.66
  EFFECTIVE AREA(ACRES) =  13777.89  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    9068.15

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     7096.15   26.91    1.420  0.30( 0.30) 1.00    4071.8   11000.00
      2     8393.69   40.90    1.129  0.30( 0.30) 1.00    7153.8   10850.00
      3     8410.55   42.07    1.115  0.30( 0.30) 1.00    7409.3   10800.00
      4     8670.77   44.21    1.090  0.30( 0.30) 1.00    8006.0   10900.00
      5     8971.09   47.38    1.052  0.30( 0.30) 1.00    8798.5   10830.00
      6     8976.04   47.45    1.051  0.30( 0.30) 1.00    8814.4   10910.00
      7     9012.86   48.33    1.041  0.30( 0.30) 1.00    8980.9   10630.00
      8     8980.68   60.88    0.933  0.30( 0.30) 1.00   11458.6   10600.00
      9     9045.59   68.49    0.897  0.30( 0.30) 1.00   12988.5   10500.00
     10     9068.15   72.66    0.877  0.30( 0.30) 1.00   13777.9   10710.00
     11     9039.09   75.18    0.865  0.30( 0.30) 1.00   14164.6   10410.00
     12     8951.73   80.46    0.839  0.30( 0.30) 1.00   14877.7   10700.00
     13     8840.13   86.68    0.810  0.30( 0.30) 1.00   15657.7   10400.00
     14     8728.45   90.23    0.793  0.30( 0.30) 1.00   16031.5   10200.00
     15     8526.59   97.00    0.776  0.30( 0.30) 1.00   16650.9   10320.00
     16     8519.93   97.15    0.776  0.30( 0.30) 1.00   16660.7   10300.00
     17     8277.74  101.26    0.765  0.30( 0.30) 1.00   16813.1   10210.00
     18     7054.21  131.50    0.698  0.30( 0.30) 1.00   17533.1   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S11.DAT
  TIME/DATE OF STUDY: 10:22 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.379
   2)   10.00;  2.849
   3)   15.00;  1.997
   4)   20.00;  1.715
   5)   25.00;  1.485
   6)   30.00;  1.315
   7)   40.00;  1.140
   8)   50.00;  1.021
   9)   60.00;  0.937
  10)   90.00;  0.794
  11)  120.00;  0.718
  12)  180.00;  0.611
  13)  360.00;  0.468
  14) 1440.00;  0.210
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11101.00 TO NODE  11102.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   920.30
  ELEVATION DATA: UPSTREAM(FEET) =   4391.58  DOWNSTREAM(FEET) =   4080.28

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.444
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.262
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.68      0.30     1.000     0   13.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.73
  TOTAL AREA(ACRES) =      2.68   PEAK FLOW RATE(CFS) =      4.73

************************************************************************
  FLOW PROCESS FROM NODE  11102.00 TO NODE  11103.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4080.28  DOWNSTREAM(FEET) =   3876.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.85   CHANNEL SLOPE =  0.2123
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.946
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.50
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   15.90
  SUBAREA AREA(ACRES) =    39.96       SUBAREA RUNOFF(CFS) =   59.20
  EFFECTIVE AREA(ACRES) =     42.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       42.6          PEAK FLOW RATE(CFS) =      63.17
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   8.13
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11103.00 =    1880.15 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11103.00 TO NODE  11104.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3876.52  DOWNSTREAM(FEET) =   3625.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1902.80   CHANNEL SLOPE =  0.1317
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.14
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.733
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     112.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.39
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   3.78
  Tc(MIN.) =   19.68
  SUBAREA AREA(ACRES) =    75.64       SUBAREA RUNOFF(CFS) =   97.54
  EFFECTIVE AREA(ACRES) =    118.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.3         PEAK FLOW RATE(CFS) =     152.53
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   9.23
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11104.00 =    3782.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11104.00 TO NODE  11105.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3625.86  DOWNSTREAM(FEET) =   3222.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2898.91   CHANNEL SLOPE =  0.1391
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.74
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.526
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      167.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     245.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.90
  AVERAGE FLOW DEPTH(FEET) =   1.68   TRAVEL TIME(MIN.) =   4.43
  Tc(MIN.) =   24.12
  SUBAREA AREA(ACRES) =   167.73       SUBAREA RUNOFF(CFS) =  185.03
  EFFECTIVE AREA(ACRES) =    286.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.0         PEAK FLOW RATE(CFS) =     315.51
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =  11.77
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11105.00 =    6681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3222.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2480.35   CHANNEL SLOPE =  0.1089
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.52
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.397
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      252.33      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     440.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.90
  AVERAGE FLOW DEPTH(FEET) =   2.47   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   27.59
  SUBAREA AREA(ACRES) =   252.33       SUBAREA RUNOFF(CFS) =  249.12
  EFFECTIVE AREA(ACRES) =    538.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      538.3         PEAK FLOW RATE(CFS) =     531.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.74   FLOW VELOCITY(FEET/SEC.) =  12.55
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11121.00 =    9162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.59
  RAINFALL INTENSITY(INCH/HR) =   1.40
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     538.34
  TOTAL STREAM AREA(ACRES) =     538.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     531.49
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11111.00 TO NODE  11112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   329.73
  ELEVATION DATA: UPSTREAM(FEET) =   4094.14  DOWNSTREAM(FEET) =   3956.68

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.552
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.292
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.49      0.30     1.000     0    8.55
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.01
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      4.01

****************************************************************************
  FLOW PROCESS FROM NODE  11112.00 TO NODE  11113.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3956.68  DOWNSTREAM(FEET) =   3752.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.35   CHANNEL SLOPE =  0.3066
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.746
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        9.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.40
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   2.05
  Tc(MIN.) =   10.60
  SUBAREA AREA(ACRES) =     9.55       SUBAREA RUNOFF(CFS) =   21.03
  EFFECTIVE AREA(ACRES) =     11.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       11.0         PEAK FLOW RATE(CFS) =      24.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   6.53
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11113.00 =     995.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11113.00 TO NODE  11114.00 IS CODE =  56
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3752.68  DOWNSTREAM(FEET) =   3541.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   955.83   CHANNEL SLOPE =  0.2209
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.384
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       26.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.49
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =   12.73
  SUBAREA AREA(ACRES) =    26.09       SUBAREA RUNOFF(CFS) =   48.93
  EFFECTIVE AREA(ACRES) =     37.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.1         PEAK FLOW RATE(CFS) =      69.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.72   FLOW VELOCITY(FEET/SEC.) =   8.45
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11114.00 =    1950.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11114.00 TO NODE  11115.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3541.57  DOWNSTREAM(FEET) =   3320.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.90   CHANNEL SLOPE =  0.1172
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.901
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       51.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     106.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.92
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   3.98
  Tc(MIN.) =   16.71
  SUBAREA AREA(ACRES) =    51.13       SUBAREA RUNOFF(CFS) =   73.66
  EFFECTIVE AREA(ACRES) =     88.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       88.3         PEAK FLOW RATE(CFS) =     127.14
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   8.40
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11115.00 =    3840.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11115.00 TO NODE  11116.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3320.00  DOWNSTREAM(FEET) =   3162.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.45   CHANNEL SLOPE =  0.0837
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.03
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.709
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     250.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.19
  AVERAGE FLOW DEPTH(FEET) =   1.96   TRAVEL TIME(MIN.) =   3.42
  Tc(MIN.) =   20.13
  SUBAREA AREA(ACRES) =   193.52       SUBAREA RUNOFF(CFS) =  245.46
  EFFECTIVE AREA(ACRES) =    281.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.8         PEAK FLOW RATE(CFS) =     357.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.38   FLOW VELOCITY(FEET/SEC.) =  10.20
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11116.00 =    5724.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11116.00 TO NODE  11117.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3162.36  DOWNSTREAM(FEET) =   3062.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.90   CHANNEL SLOPE =  0.0524
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.96
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.548
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.47      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     420.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.04
  AVERAGE FLOW DEPTH(FEET) =   2.93   TRAVEL TIME(MIN.) =   3.51
  Tc(MIN.) =   23.64
  SUBAREA AREA(ACRES) =   112.47       SUBAREA RUNOFF(CFS) =  126.31
  EFFECTIVE AREA(ACRES) =    394.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      394.2         PEAK FLOW RATE(CFS) =     442.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.01   FLOW VELOCITY(FEET/SEC.) =   9.18
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11117.00 =    7628.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1878.40   CHANNEL SLOPE =  0.0587
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.02
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.422
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     468.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.69
  AVERAGE FLOW DEPTH(FEET) =   3.02   TRAVEL TIME(MIN.) =   3.23
  Tc(MIN.) =   26.86
  SUBAREA AREA(ACRES) =    51.63       SUBAREA RUNOFF(CFS) =   52.12
  EFFECTIVE AREA(ACRES) =    445.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      445.9         PEAK FLOW RATE(CFS) =     450.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.95   FLOW VELOCITY(FEET/SEC.) =   9.60
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.86
  RAINFALL INTENSITY(INCH/HR) =   1.42
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     445.88
  TOTAL STREAM AREA(ACRES) =     445.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     450.11

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      531.49   27.59    1.397  0.30( 0.30) 1.00     538.3   11101.00
      2      450.11   26.86    1.422  0.30( 0.30) 1.00     445.9   11111.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      979.27   26.86    1.422  0.30( 0.30) 1.00     970.1   11111.00
      2      971.70   27.59    1.397  0.30( 0.30) 1.00     984.2   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     979.27    Tc(MIN.) =    26.86
  EFFECTIVE AREA(ACRES) =     970.06   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      984.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11121.00 TO NODE  11122.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2952.48  DOWNSTREAM(FEET) =   2639.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2687.92   CHANNEL SLOPE =  0.1165
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.324
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      170.98      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1058.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.57
  AVERAGE FLOW DEPTH(FEET) =   3.84   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   29.74
  SUBAREA AREA(ACRES) =   170.98       SUBAREA RUNOFF(CFS) =  157.55
  EFFECTIVE AREA(ACRES) =   1141.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
  TOTAL AREA(ACRES) =     1155.2         PEAK FLOW RATE(CFS) =    1051.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.83   FLOW VELOCITY(FEET/SEC.) =  15.53
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11122.00 =   12194.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2639.37  DOWNSTREAM(FEET) =   1954.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3696.53   CHANNEL SLOPE =  0.1854
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.49
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.262
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      114.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1101.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.64
  AVERAGE FLOW DEPTH(FEET) =   3.48   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   33.05
  SUBAREA AREA(ACRES) =   114.61       SUBAREA RUNOFF(CFS) =   99.20
  EFFECTIVE AREA(ACRES) =   1255.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1269.8         PEAK FLOW RATE(CFS) =    1086.85
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.46   FLOW VELOCITY(FEET/SEC.) =  18.57
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.05
  RAINFALL INTENSITY(INCH/HR) =   1.26
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1255.65
  TOTAL STREAM AREA(ACRES) =    1269.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1086.85
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11130.00 TO NODE  11131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   259.85
  ELEVATION DATA: UPSTREAM(FEET) =   3923.93  DOWNSTREAM(FEET) =   3765.35

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.204
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.704
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.27      0.30     1.000     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.89
  TOTAL AREA(ACRES) =      1.27   PEAK FLOW RATE(CFS) =      3.89

****************************************************************************
  FLOW PROCESS FROM NODE  11131.00 TO NODE  11132.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3765.35  DOWNSTREAM(FEET) =   3414.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   674.05   CHANNEL SLOPE =  0.5200
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.117
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.85
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   1.92
  Tc(MIN.) =    9.13
  SUBAREA AREA(ACRES) =     6.52       SUBAREA RUNOFF(CFS) =   16.53
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      19.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   7.10
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11132.00 =     933.90 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  11132.00 TO NODE  11133.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3414.86  DOWNSTREAM(FEET) =   2699.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1813.44   CHANNEL SLOPE =  0.3945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.471
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      61.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.76
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   3.10
  Tc(MIN.) =   12.22
  SUBAREA AREA(ACRES) =    41.63       SUBAREA RUNOFF(CFS) =   81.33
  EFFECTIVE AREA(ACRES) =     49.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       49.4         PEAK FLOW RATE(CFS) =      96.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =  11.45
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11133.00 =    2747.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11133.00 TO NODE  11134.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2699.51  DOWNSTREAM(FEET) =   2464.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1053.33   CHANNEL SLOPE =  0.2235
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.44
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.230
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      142.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     220.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.42
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   1.41
  Tc(MIN.) =   13.63
  SUBAREA AREA(ACRES) =   142.85       SUBAREA RUNOFF(CFS) =  248.10
  EFFECTIVE AREA(ACRES) =    192.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =      192.3         PEAK FLOW RATE(CFS) =     333.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.75   FLOW VELOCITY(FEET/SEC.) =  14.13
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11134.00 =    3800.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.06  DOWNSTREAM(FEET) =   1954.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1291.98   CHANNEL SLOPE =  0.3946
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.55
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.020
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.58      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     352.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.47
  AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   1.23
  Tc(MIN.) =   14.87
  SUBAREA AREA(ACRES) =    24.58       SUBAREA RUNOFF(CFS) =   38.04
  EFFECTIVE AREA(ACRES) =    216.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      216.9         PEAK FLOW RATE(CFS) =     335.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =  17.24
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11141.00 =    5092.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.87
  RAINFALL INTENSITY(INCH/HR) =   2.02
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     216.85
  TOTAL STREAM AREA(ACRES) =     216.85
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     335.62

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1086.85   33.05    1.262  0.30( 0.30) 1.00    1255.6   11111.00
      1     1084.36   33.78    1.249  0.30( 0.30) 1.00    1269.8   11101.00
      2      335.62   14.87    2.020  0.30( 0.30) 1.00     216.9   11130.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1209.91   14.87    2.020  0.30( 0.30) 1.00     781.7   11130.00
      2     1274.55   33.05    1.262  0.30( 0.30) 1.00    1472.5   11111.00
      3     1269.54   33.78    1.249  0.30( 0.30) 1.00    1486.7   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1274.55    Tc(MIN.) =    33.05
  EFFECTIVE AREA(ACRES) =    1472.50   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1486.7
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1486.7  TC(MIN.) =     33.05
  EFFECTIVE AREA(ACRES) =   1472.50  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1274.55

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1209.91   14.87    2.020  0.30( 0.30) 1.00     781.7   11130.00
      2     1274.55   33.05    1.262  0.30( 0.30) 1.00    1472.5   11111.00
      3     1269.54   33.78    1.249  0.30( 0.30) 1.00    1486.7   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S12.DAT
  TIME/DATE OF STUDY: 10:22 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.379
   2)   10.00;  2.849
   3)   15.00;  1.997
   4)   20.00;  1.715
   5)   25.00;  1.485
   6)   30.00;  1.315
   7)   40.00;  1.140
   8)   50.00;  1.021
   9)   60.00;  0.937
  10)   90.00;  0.794
  11)  120.00;  0.718
  12)  180.00;  0.611
  13)  360.00;  0.468
  14) 1440.00;  0.210
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11220.00 TO NODE  11221.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   762.39
  ELEVATION DATA: UPSTREAM(FEET) =   3797.72  DOWNSTREAM(FEET) =   3296.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.919
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.692
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        5.02      0.30     1.000     0   10.92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.81
  TOTAL AREA(ACRES) =      5.02   PEAK FLOW RATE(CFS) =     10.81

**************************************************************************
  FLOW PROCESS FROM NODE  11221.00 TO NODE  11223.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3296.86  DOWNSTREAM(FEET) =   2738.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   912.82   CHANNEL SLOPE =  0.6112
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.414
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.31
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   1.63
  Tc(MIN.) =   12.55
  SUBAREA AREA(ACRES) =    26.44       SUBAREA RUNOFF(CFS) =   50.31
  EFFECTIVE AREA(ACRES) =     31.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.5          PEAK FLOW RATE(CFS) =      59.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =  11.24
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11223.00 =    1675.21 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11223.00 TO NODE  11224.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2738.96  DOWNSTREAM(FEET) =   2370.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.79   CHANNEL SLOPE =  0.3843
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.198
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     130.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.60
  AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   1.27
  Tc(MIN.) =   13.82
  SUBAREA AREA(ACRES) =    82.44       SUBAREA RUNOFF(CFS) =  140.80
  EFFECTIVE AREA(ACRES) =    113.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.9         PEAK FLOW RATE(CFS) =     194.53
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.11   FLOW VELOCITY(FEET/SEC.) =  14.35
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11224.00 =    2635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2370.12  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.40   CHANNEL SLOPE =  0.2591
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.908
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     239.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.44
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   2.76
  Tc(MIN.) =   16.58
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =   89.62
  EFFECTIVE AREA(ACRES) =    175.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      175.8         PEAK FLOW RATE(CFS) =     254.45
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.44   FLOW VELOCITY(FEET/SEC.) =  13.66
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S11.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1209.91   14.87  0.30( 0.30) 1.00     781.7   11130.00
      2     1274.55   33.05  0.30( 0.30) 1.00    1472.5   11111.00
      3     1269.54   33.78  0.30( 0.30) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =     1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1209.91   14.87  0.30( 0.30) 1.00     781.7   11130.00
      2     1274.55   33.05  0.30( 0.30) 1.00    1472.5   11111.00
      3     1269.54   33.78  0.30( 0.30) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =      1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11231.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1954.20  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1435.64   CHANNEL SLOPE =  0.1116
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.236
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       89.78      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1312.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.25
  AVERAGE FLOW DEPTH(FEET) =   4.33   TRAVEL TIME(MIN.) =   1.47
  Tc(MIN.) =   34.52
  SUBAREA AREA(ACRES) =    89.78       SUBAREA RUNOFF(CFS) =   75.63
  EFFECTIVE AREA(ACRES) =   1562.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1576.4          PEAK FLOW RATE(CFS) =    1316.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.34   FLOW VELOCITY(FEET/SEC.) =  16.25
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1271.35   16.35    1.921  0.30( 0.30) 1.00     871.5   11130.00
      2     1316.03   34.52    1.236  0.30( 0.30) 1.00    1562.3   11111.00
      3     1309.59   35.26    1.223  0.30( 0.30) 1.00    1576.4   11101.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      254.45   16.58    1.908  0.30( 0.30) 1.00     175.8   11220.00
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1524.30   16.35    1.921  0.30( 0.30) 1.00    1044.9   11130.00
      2     1526.36   16.58    1.908  0.30( 0.30) 1.00    1056.1   11220.00
      3     1464.14   34.52    1.236  0.30( 0.30) 1.00    1738.1   11111.00
      4     1455.65   35.26    1.223  0.30( 0.30) 1.00    1752.3   11101.00
    TOTAL AREA(ACRES) =      1752.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1526.36  Tc(MIN.) =   16.581
  EFFECTIVE AREA(ACRES) =   1056.08  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1752.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.01  DOWNSTREAM(FEET) =   1680.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.84   CHANNEL SLOPE =  0.0585
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.54
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.772
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1565.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.42
  AVERAGE FLOW DEPTH(FEET) =   5.54   TRAVEL TIME(MIN.) =   2.40
  Tc(MIN.) =   18.98
  SUBAREA AREA(ACRES) =    59.78       SUBAREA RUNOFF(CFS) =   79.22
  EFFECTIVE AREA(ACRES) =   1115.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1812.1          PEAK FLOW RATE(CFS) =    1526.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.47   FLOW VELOCITY(FEET/SEC.) =  13.34
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.98
  RAINFALL INTENSITY(INCH/HR) =   1.77
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1115.86
  TOTAL STREAM AREA(ACRES) =    1812.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1526.36

****************************************************************************
  FLOW PROCESS FROM NODE  11201.00 TO NODE  11202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   986.34
  ELEVATION DATA: UPSTREAM(FEET) =   3383.22  DOWNSTREAM(FEET) =   3248.87

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.343
```

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  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.620
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                -       8.54      0.30     1.000     0   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     17.83
  TOTAL AREA(ACRES) =      8.54   PEAK FLOW RATE(CFS) =     17.83

****************************************************************************
  FLOW PROCESS FROM NODE  11202.00 TO NODE  11203.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3248.87  DOWNSTREAM(FEET) =   3198.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   922.69   CHANNEL SLOPE =  0.0550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.82
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.014
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.32
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   3.56
  Tc(MIN.) =   14.90
  SUBAREA AREA(ACRES) =    24.42       SUBAREA RUNOFF(CFS) =   37.67
  EFFECTIVE AREA(ACRES) =     32.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      50.85
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   4.82
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11203.00 =    1909.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11203.00 TO NODE  11204.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3198.08  DOWNSTREAM(FEET) =   3062.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1941.08   CHANNEL SLOPE =  0.0699
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.09
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.698
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       37.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.93
  AVERAGE FLOW DEPTH(FEET) =   1.04   TRAVEL TIME(MIN.) =   5.46
  Tc(MIN.) =   20.36
  SUBAREA AREA(ACRES) =    37.67       SUBAREA RUNOFF(CFS) =   47.41
  EFFECTIVE AREA(ACRES) =     70.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =      88.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =   6.25
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11204.00 =    3850.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11204.00 TO NODE  11205.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.48  DOWNSTREAM(FEET) =   2940.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.73   CHANNEL SLOPE =  0.0636
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.474
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     107.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.45
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   4.95
  Tc(MIN.) =   25.31
  SUBAREA AREA(ACRES) =    34.87       SUBAREA RUNOFF(CFS) =   36.86
  EFFECTIVE AREA(ACRES) =    105.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      105.5         PEAK FLOW RATE(CFS) =     111.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   6.52
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11205.00 =    5766.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11205.00 TO NODE  11206.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
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>>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2940.56  DOWNSTREAM(FEET) =   2581.93
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2865.58   CHANNEL SLOPE =  0.1252
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.27
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.302
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       56.17      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     136.86
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.77
 AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   5.44
 Tc(MIN.) =   30.76
 SUBAREA AREA(ACRES) =    56.17       SUBAREA RUNOFF(CFS) =   50.65
 EFFECTIVE AREA(ACRES) =    161.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      161.7         PEAK FLOW RATE(CFS) =     145.77
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.29   FLOW VELOCITY(FEET/SEC.) =   8.95
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11206.00 =    8632.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11206.00 TO NODE  11207.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2581.93  DOWNSTREAM(FEET) =   2317.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1985.44   CHANNEL SLOPE =  0.1333
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.20
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.254
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      546.87      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     380.80
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.24
 AVERAGE FLOW DEPTH(FEET) =   2.17   TRAVEL TIME(MIN.) =   2.70
 Tc(MIN.) =   33.46
 SUBAREA AREA(ACRES) =   546.87       SUBAREA RUNOFF(CFS) =  469.81
 EFFECTIVE AREA(ACRES) =    708.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      708.5         PEAK FLOW RATE(CFS) =     608.70
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
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 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.79

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.79   FLOW VELOCITY(FEET/SEC.) =  14.02
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11207.00 =   10617.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2317.20  DOWNSTREAM(FEET) =   1680.94
 CHANNEL LENGTH THRU SUBAREA(FEET) =  4085.95   CHANNEL SLOPE =  0.1557
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.04
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.179
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      389.75      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     762.95
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.82
 AVERAGE FLOW DEPTH(FEET) =   3.01   TRAVEL TIME(MIN.) =   4.31
 Tc(MIN.) =   37.76
 SUBAREA AREA(ACRES) =   389.75       SUBAREA RUNOFF(CFS) =  308.40
 EFFECTIVE AREA(ACRES) =   1098.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1098.3         PEAK FLOW RATE(CFS) =     869.05
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.22

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.22   FLOW VELOCITY(FEET/SEC.) =  16.39
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11241.00 =   14703.81 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   37.76
 RAINFALL INTENSITY(INCH/HR) =   1.18
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    1098.29
 TOTAL STREAM AREA(ACRES) =    1098.29
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     869.05

 ** CONFLUENCE DATA **
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 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1524.30   18.75    1.785  0.30( 0.30) 1.00    1104.7   11130.00
    1     1526.36   18.98    1.772  0.30( 0.30) 1.00    1115.9   11220.00
    1     1464.14   36.95    1.193  0.30( 0.30) 1.00    1797.9   11111.00
    1     1455.65   37.70    1.180  0.30( 0.30) 1.00    1812.1   11101.00
    2      869.05   37.76    1.179  0.30( 0.30) 1.00    1098.3   11201.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     2253.42   18.75    1.785  0.30( 0.30) 1.00    1650.1   11130.00
    2     2257.96   18.98    1.772  0.30( 0.30) 1.00    1667.9   11220.00
    3     2328.25   36.95    1.193  0.30( 0.30) 1.00    2872.5   11111.00
    4     2324.31   37.70    1.180  0.30( 0.30) 1.00    2908.3   11101.00
    5     2322.72   37.76    1.179  0.30( 0.30) 1.00    2910.3   11201.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2328.25    Tc(MIN.) =    36.95
  EFFECTIVE AREA(ACRES) =    2872.54   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2910.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11241.00 TO NODE  11242.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1680.94  DOWNSTREAM(FEET) =   1521.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1795.61   CHANNEL SLOPE =  0.0890
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.15
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.163
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      198.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2405.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.53
  AVERAGE FLOW DEPTH(FEET) =   6.15   TRAVEL TIME(MIN.) =   1.71
  Tc(MIN.) =   38.66
  SUBAREA AREA(ACRES) =   198.62       SUBAREA RUNOFF(CFS) =  154.37
  EFFECTIVE AREA(ACRES) =   3071.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3109.0         PEAK FLOW RATE(CFS) =    2386.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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```
  DEPTH(FEET) =  6.13   FLOW VELOCITY(FEET/SEC.) =  17.50
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11242.00 =   21056.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1521.21  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.33   CHANNEL SLOPE =  0.0797
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.130
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       95.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2422.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.87
  AVERAGE FLOW DEPTH(FEET) =   6.34   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =   40.86
  SUBAREA AREA(ACRES) =    95.39       SUBAREA RUNOFF(CFS) =   71.25
  EFFECTIVE AREA(ACRES) =   3166.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3204.3         PEAK FLOW RATE(CFS) =    2386.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.29   FLOW VELOCITY(FEET/SEC.) =  16.81
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   40.86
  RAINFALL INTENSITY(INCH/HR) =   1.13
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3166.55
  TOTAL STREAM AREA(ACRES) =    3204.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2386.88

****************************************************************************
  FLOW PROCESS FROM NODE  11250.00 TO NODE  11251.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   982.50
  ELEVATION DATA: UPSTREAM(FEET) =   3806.44  DOWNSTREAM(FEET) =   3168.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.112
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.489
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.91      0.30     1.000     0   12.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.64
  TOTAL AREA(ACRES) =      5.91   PEAK FLOW RATE(CFS) =     11.64

********************************************************************************
  FLOW PROCESS FROM NODE  11251.00 TO NODE  11252.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3168.25  DOWNSTREAM(FEET) =   2683.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.5240
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.31
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.136
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.44
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   2.07
  Tc(MIN.) =   14.19
  SUBAREA AREA(ACRES) =    13.73       SUBAREA RUNOFF(CFS) =   22.69
  EFFECTIVE AREA(ACRES) =     19.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       19.6         PEAK FLOW RATE(CFS) =      32.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   8.52
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11252.00 =    1908.12 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  11252.00 TO NODE  11253.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   2683.24  DOWNSTREAM(FEET) =   2334.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.66   CHANNEL SLOPE =  0.3694
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.66
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.957
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       55.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      73.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.29
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   1.53
  Tc(MIN.) =   15.72
  SUBAREA AREA(ACRES) =    55.67       SUBAREA RUNOFF(CFS) =   83.00
  EFFECTIVE AREA(ACRES) =     75.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       75.3         PEAK FLOW RATE(CFS) =     112.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.82   FLOW VELOCITY(FEET/SEC.) =  11.78
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11253.00 =    2852.78 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  11253.00 TO NODE  11254.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2334.26  DOWNSTREAM(FEET) =   1768.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2293.59   CHANNEL SLOPE =  0.2468
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.790
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     223.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.90
  AVERAGE FLOW DEPTH(FEET) =   1.36   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   18.68
  SUBAREA AREA(ACRES) =   165.43       SUBAREA RUNOFF(CFS) =  221.78
  EFFECTIVE AREA(ACRES) =    240.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      240.7         PEAK FLOW RATE(CFS) =     322.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.67
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.67   FLOW VELOCITY(FEET/SEC.) =  14.45
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11254.00 =    5146.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11254.00 TO NODE  11255.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1768.11  DOWNSTREAM(FEET) =   1506.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.59   CHANNEL SLOPE =  0.1376
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.36
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.663
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     442.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.95
  AVERAGE FLOW DEPTH(FEET) =   2.33   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =   21.12
  SUBAREA AREA(ACRES) =   194.55       SUBAREA RUNOFF(CFS) =  238.74
  EFFECTIVE AREA(ACRES) =    435.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      435.3         PEAK FLOW RATE(CFS) =     534.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.58   FLOW VELOCITY(FEET/SEC.) =  13.69
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11255.00 =    7043.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.97  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =   882.10   CHANNEL SLOPE =  0.1848
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.58
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.621
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      137.86      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     616.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.80
```



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  AVERAGE FLOW DEPTH(FEET) =   2.57   TRAVEL TIME(MIN.) =   0.93
  Tc(MIN.) =   22.05
  SUBAREA AREA(ACRES) =   137.86       SUBAREA RUNOFF(CFS) =  163.86
  EFFECTIVE AREA(ACRES) =    573.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      573.1         PEAK FLOW RATE(CFS) =     681.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.71   FLOW VELOCITY(FEET/SEC.) =  16.28
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11261.00 =    7926.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.05
  RAINFALL INTENSITY(INCH/HR) =   1.62
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     573.15
  TOTAL STREAM AREA(ACRES) =     573.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     681.26

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2318.90   22.67    1.592  0.30( 0.30) 1.00    1944.1   11130.00
      1     2323.60   22.90    1.582  0.30( 0.30) 1.00    1961.9   11220.00
      1     2386.88   40.86    1.130  0.30( 0.30) 1.00    3166.6   11111.00
      1     2378.28   41.60    1.121  0.30( 0.30) 1.00    3202.4   11101.00
      1     2376.38   41.67    1.120  0.30( 0.30) 1.00    3204.3   11201.00
      2      681.26   22.05    1.621  0.30( 0.30) 1.00     573.1   11250.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2986.50   22.05    1.621  0.30( 0.30) 1.00    2464.0   11250.00
      2     2985.42   22.67    1.592  0.30( 0.30) 1.00    2517.3   11130.00
      3     2984.70   22.90    1.582  0.30( 0.30) 1.00    2535.1   11220.00
      4     2814.96   40.86    1.130  0.30( 0.30) 1.00    3739.7   11111.00
      5     2801.79   41.60    1.121  0.30( 0.30) 1.00    3775.5   11101.00
      6     2799.46   41.67    1.120  0.30( 0.30) 1.00    3777.5   11201.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2986.50   Tc(MIN.) =    22.05
  EFFECTIVE AREA(ACRES) =    2464.02   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
```

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  TOTAL AREA(ACRES) =     3777.5
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1343.95  DOWNSTREAM(FEET) =   1299.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =   889.38   CHANNEL SLOPE =  0.0503
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.84
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.575
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.65      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3032.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.07
  AVERAGE FLOW DEPTH(FEET) =   7.84   TRAVEL TIME(MIN.) =   0.98
  Tc(MIN.) =   23.04
  SUBAREA AREA(ACRES) =    79.65       SUBAREA RUNOFF(CFS) =   91.43
  EFFECTIVE AREA(ACRES) =   2543.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3857.1         PEAK FLOW RATE(CFS) =    2986.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.78   FLOW VELOCITY(FEET/SEC.) =  15.02
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11310.00 =   24168.81 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3857.1  TC(MIN.) =     23.04
  EFFECTIVE AREA(ACRES) =   2543.67  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    2986.50

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2986.50   23.04    1.575  0.30( 0.30) 1.00    2543.7   11250.00
      2     2985.42   23.66    1.547  0.30( 0.30) 1.00    2596.9   11130.00
      3     2984.70   23.88    1.536  0.30( 0.30) 1.00    2614.7   11220.00
      4     2814.96   41.86    1.118  0.30( 0.30) 1.00    3819.4   11111.00
      5     2807.34   42.60    1.109  0.30( 0.30) 1.00    3855.2   11101.00
      6     2805.80   42.67    1.108  0.30( 0.30) 1.00    3857.1   11201.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S13.DAT
  TIME/DATE OF STUDY: 10:23 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.379
   2)   10.00;  2.849
   3)   15.00;  1.997
   4)   20.00;  1.715
   5)   25.00;  1.485
   6)   30.00;  1.315
   7)   40.00;  1.140
   8)   50.00;  1.021
   9)   60.00;  0.937
  10)   90.00;  0.794
  11)  120.00;  0.718
  12)  180.00;  0.611
  13)  360.00;  0.468
  14) 1440.00;  0.210
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11300.00 TO NODE  11301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   455.90
  ELEVATION DATA: UPSTREAM(FEET) =   3394.67  DOWNSTREAM(FEET) =   3247.06

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.240
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.808
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.53      0.30     1.000     0   10.24
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.71
  TOTAL AREA(ACRES) =      2.53   PEAK FLOW RATE(CFS) =      5.71

****************************************************************************
  FLOW PROCESS FROM NODE  11301.00 TO NODE  11301.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3247.06  DOWNSTREAM(FEET) =   3150.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   468.69   CHANNEL SLOPE =  0.2059
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.540
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.97
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.57
  Tc(MIN.) =   11.81
  SUBAREA AREA(ACRES) =    10.95       SUBAREA RUNOFF(CFS) =   22.08
  EFFECTIVE AREA(ACRES) =     13.48     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.5          PEAK FLOW RATE(CFS) =      27.18
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   5.93
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11301.50 =     924.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11301.50 TO NODE  11302.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3150.57  DOWNSTREAM(FEET) =   2840.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =   982.20   CHANNEL SLOPE =  0.3162
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.169
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.51
  AVERAGE FLOW DEPTH(FEET) =   0.43   TRAVEL TIME(MIN.) =   2.18
  Tc(MIN.) =   13.99
  SUBAREA AREA(ACRES) =     9.59       SUBAREA RUNOFF(CFS) =   16.13
  EFFECTIVE AREA(ACRES) =     23.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.1         PEAK FLOW RATE(CFS) =      38.81
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   7.71
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11302.00 =    1906.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11302.00 TO NODE  11303.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2840.04  DOWNSTREAM(FEET) =   2177.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.03   CHANNEL SLOPE =  0.3460
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.82
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.892
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      99.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.10
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   16.87
  SUBAREA AREA(ACRES) =    84.31       SUBAREA RUNOFF(CFS) =  120.78
  EFFECTIVE AREA(ACRES) =    107.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.4         PEAK FLOW RATE(CFS) =     153.83
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =  12.87
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11303.00 =    3822.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11303.00 TO NODE  11304.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2177.16  DOWNSTREAM(FEET) =   1612.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2472.34   CHANNEL SLOPE =  0.2285
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.707
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       99.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     217.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.45
  AVERAGE FLOW DEPTH(FEET) =   1.37   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   20.18
  SUBAREA AREA(ACRES) =    99.61       SUBAREA RUNOFF(CFS) =  126.13
  EFFECTIVE AREA(ACRES) =    206.99     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.0         PEAK FLOW RATE(CFS) =     262.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.52   FLOW VELOCITY(FEET/SEC.) =  13.21
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11304.00 =    6295.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1612.27  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2432.96   CHANNEL SLOPE =  0.1604
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.553
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.86      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     292.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.10
  AVERAGE FLOW DEPTH(FEET) =   1.78   TRAVEL TIME(MIN.) =   3.35
  Tc(MIN.) =   23.53
  SUBAREA AREA(ACRES) =    53.86       SUBAREA RUNOFF(CFS) =   60.72
  EFFECTIVE AREA(ACRES) =    260.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      260.8          PEAK FLOW RATE(CFS) =     294.09
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.79   FLOW VELOCITY(FEET/SEC.) =  12.11
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S12.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2986.50   23.04  0.30( 0.30) 1.00    2543.7   11250.00
      2     2985.42   23.66  0.30( 0.30) 1.00    2596.9   11130.00
      3     2984.70   23.88  0.30( 0.30) 1.00    2614.7   11220.00
      4     2814.96   41.86  0.30( 0.30) 1.00    3819.4   11111.00
      5     2807.34   42.60  0.30( 0.30) 1.00    3855.2   11101.00
      6     2805.80   42.67  0.30( 0.30) 1.00    3857.1   11201.00
    TOTAL AREA(ACRES) =     3857.1

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2986.50   23.04  0.30( 0.30) 1.00    2543.7   11250.00
      2     2985.42   23.66  0.30( 0.30) 1.00    2596.9   11130.00
      3     2984.70   23.88  0.30( 0.30) 1.00    2614.7   11220.00
      4     2814.96   41.86  0.30( 0.30) 1.00    3819.4   11111.00
      5     2807.34   42.60  0.30( 0.30) 1.00    3855.2   11101.00
      6     2805.80   42.67  0.30( 0.30) 1.00    3857.1   11201.00
    TOTAL AREA(ACRES) =     3857.1
```



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****************************************************************************
  FLOW PROCESS FROM NODE  11310.00 TO NODE  11320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1299.17  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1694.05   CHANNEL SLOPE =  0.0455
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.02
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.486
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.22      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3030.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.51
  AVERAGE FLOW DEPTH(FEET) =   8.02   TRAVEL TIME(MIN.) =   1.95
  Tc(MIN.) =   24.98
  SUBAREA AREA(ACRES) =    83.22       SUBAREA RUNOFF(CFS) =   88.82
  EFFECTIVE AREA(ACRES) =   2626.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3940.4          PEAK FLOW RATE(CFS) =    2986.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.97   FLOW VELOCITY(FEET/SEC.) =  14.45
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2986.50   24.98    1.486  0.30( 0.30) 1.00    2626.9   11250.00
      2     2985.42   25.60    1.465  0.30( 0.30) 1.00    2680.2   11130.00
      3     2984.70   25.83    1.457  0.30( 0.30) 1.00    2697.9   11220.00
      4     2814.96   43.83    1.094  0.30( 0.30) 1.00    3902.6   11111.00
      5     2807.34   44.58    1.085  0.30( 0.30) 1.00    3938.4   11101.00
      6     2805.80   44.65    1.085  0.30( 0.30) 1.00    3940.4   11201.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      294.09   23.53    1.553  0.30( 0.30) 1.00     260.8   11300.00
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)     NODE
     1     3265.44   23.53    1.553  0.30( 0.30) 1.00    2735.0   11300.00
     2     3264.92   24.98    1.486  0.30( 0.30) 1.00    2887.7   11250.00
     3     3258.83   25.60    1.465  0.30( 0.30) 1.00    2941.0   11130.00
     4     3256.29   25.83    1.457  0.30( 0.30) 1.00    2958.8   11220.00
     5     3001.48   43.83    1.094  0.30( 0.30) 1.00    4163.4   11111.00
     6     2991.76   44.58    1.085  0.30( 0.30) 1.00    4199.2   11101.00
     7     2990.02   44.65    1.085  0.30( 0.30) 1.00    4201.2   11201.00
   TOTAL AREA(ACRES) =      4201.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     3265.44  Tc(MIN.) =   23.529
 EFFECTIVE AREA(ACRES) =   2735.05  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4201.2
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1222.10  DOWNSTREAM(FEET) =   1092.58
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3157.19   CHANNEL SLOPE =  0.0410
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.73
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.411
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      328.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3429.74
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.41
 AVERAGE FLOW DEPTH(FEET) =   8.69   TRAVEL TIME(MIN.) =   3.65
 Tc(MIN.) =   27.18
 SUBAREA AREA(ACRES) =   328.55       SUBAREA RUNOFF(CFS) =  328.48
 EFFECTIVE AREA(ACRES) =   3063.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     4529.8         PEAK FLOW RATE(CFS) =    3265.44
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.50

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.50   FLOW VELOCITY(FEET/SEC.) =  14.24
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   27.18
 RAINFALL INTENSITY(INCH/HR) =   1.41
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    3063.60
 TOTAL STREAM AREA(ACRES) =    4529.77
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    3265.44

****************************************************************************
 FLOW PROCESS FROM NODE  11330.00 TO NODE  11331.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.83
 ELEVATION DATA: UPSTREAM(FEET) =   3270.16  DOWNSTREAM(FEET) =   3123.64

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.975
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.469
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        1.69      0.30     1.000     0    7.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      4.82
 TOTAL AREA(ACRES) =      1.69   PEAK FLOW RATE(CFS) =      4.82

****************************************************************************
 FLOW PROCESS FROM NODE  11331.00 TO NODE  11332.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3123.64  DOWNSTREAM(FEET) =   2903.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =   710.41   CHANNEL SLOPE =  0.3104
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.779
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        5.82      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.38
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.86
 AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   2.44
 Tc(MIN.) =   10.41
 SUBAREA AREA(ACRES) =     5.82       SUBAREA RUNOFF(CFS) =   12.98
 EFFECTIVE AREA(ACRES) =      7.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.5         PEAK FLOW RATE(CFS) =      16.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   5.68
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11332.00 =    1010.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11332.00 TO NODE  11333.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.10  DOWNSTREAM(FEET) =   2718.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   843.93   CHANNEL SLOPE =  0.2183
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.42
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.376
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.95
  AVERAGE FLOW DEPTH(FEET) =   0.40   TRAVEL TIME(MIN.) =   2.36
  Tc(MIN.) =   12.77
  SUBAREA AREA(ACRES) =     9.66       SUBAREA RUNOFF(CFS) =   18.05
  EFFECTIVE AREA(ACRES) =     17.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.2         PEAK FLOW RATE(CFS) =      32.09
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   6.47
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11333.00 =    1854.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11333.00 TO NODE  11334.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2718.89  DOWNSTREAM(FEET) =   2364.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1084.60   CHANNEL SLOPE =  0.3264
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.995
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.01
  AVERAGE FLOW DEPTH(FEET) =   0.47   TRAVEL TIME(MIN.) =   2.26
  Tc(MIN.) =   15.03
  SUBAREA AREA(ACRES) =    11.67       SUBAREA RUNOFF(CFS) =   17.81
  EFFECTIVE AREA(ACRES) =     28.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.8         PEAK FLOW RATE(CFS) =      44.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   8.16
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11334.00 =    2938.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11334.00 TO NODE  11335.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2364.84  DOWNSTREAM(FEET) =   1729.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.08   CHANNEL SLOPE =  0.3237
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.89
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.834
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      102.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     115.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.43
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =   17.90
  SUBAREA AREA(ACRES) =   102.74       SUBAREA RUNOFF(CFS) =  141.82
  EFFECTIVE AREA(ACRES) =    131.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      131.6         PEAK FLOW RATE(CFS) =     181.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =  13.27
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11335.00 =    4901.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1729.46  DOWNSTREAM(FEET) =   1092.58
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2702.07   CHANNEL SLOPE =  0.2357
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.45
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.652
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       90.38      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     236.68
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.94
 AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   3.48
 Tc(MIN.) =   21.38
 SUBAREA AREA(ACRES) =    90.38       SUBAREA RUNOFF(CFS) =  109.96
 EFFECTIVE AREA(ACRES) =    221.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      222.0         PEAK FLOW RATE(CFS) =     270.04
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.53

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.53   FLOW VELOCITY(FEET/SEC.) =  13.51
 LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11340.00 =    7603.92 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   21.38
 RAINFALL INTENSITY(INCH/HR) =   1.65
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     221.96
 TOTAL STREAM AREA(ACRES) =     221.96
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     270.04

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3265.44   27.18    1.411  0.30( 0.30) 1.00    3063.6   11300.00
     1     3264.92   28.63    1.361  0.30( 0.30) 1.00    3216.3   11250.00
     1     3258.83   29.26    1.340  0.30( 0.30) 1.00    3269.6   11130.00
     1     3256.29   29.49    1.333  0.30( 0.30) 1.00    3287.3   11220.00
     1     3031.82   47.57    1.050  0.30( 0.30) 1.00    4492.0   11111.00
     1     3019.60   48.32    1.041  0.30( 0.30) 1.00    4527.8   11101.00
     1     3017.30   48.40    1.040  0.30( 0.30) 1.00    4529.8   11201.00
     2      270.04   21.38    1.652  0.30( 0.30) 1.00     222.0   11330.00
```



```
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3394.84   21.38    1.652  0.30( 0.30) 1.00    2631.2   11330.00
     2     3487.35   27.18    1.411  0.30( 0.30) 1.00    3285.6   11300.00
     3     3476.97   28.63    1.361  0.30( 0.30) 1.00    3438.3   11250.00
     4     3466.65   29.26    1.340  0.30( 0.30) 1.00    3491.5   11130.00
     5     3462.56   29.49    1.333  0.30( 0.30) 1.00    3509.3   11220.00
     6     3181.63   47.57    1.050  0.30( 0.30) 1.00    4713.9   11111.00
     7     3167.63   48.32    1.041  0.30( 0.30) 1.00    4749.7   11101.00
     8     3165.14   48.40    1.040  0.30( 0.30) 1.00    4751.7   11201.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    3487.35    Tc(MIN.) =    27.18
 EFFECTIVE AREA(ACRES) =    3285.56   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4751.7
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11340.00 TO NODE  11341.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1092.58  DOWNSTREAM(FEET) =   1055.49
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.69   CHANNEL SLOPE =  0.0259
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.75
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.344
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       54.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3512.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.22
 AVERAGE FLOW DEPTH(FEET) =   9.75   TRAVEL TIME(MIN.) =   1.95
 Tc(MIN.) =   29.14
 SUBAREA AREA(ACRES) =    54.55       SUBAREA RUNOFF(CFS) =   51.28
 EFFECTIVE AREA(ACRES) =   3340.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     4806.3         PEAK FLOW RATE(CFS) =    3487.35
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.72

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.72   FLOW VELOCITY(FEET/SEC.) =  12.19
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11341.00 =   30452.74 FEET.
```

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****************************************************************************
  FLOW PROCESS FROM NODE  11341.00 TO NODE  11342.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1055.49  DOWNSTREAM(FEET) =   1017.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.89   CHANNEL SLOPE =  0.0406
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.85
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.311
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      119.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3541.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.48
  AVERAGE FLOW DEPTH(FEET) =   8.84   TRAVEL TIME(MIN.) =   1.09
  Tc(MIN.) =   30.22
  SUBAREA AREA(ACRES) =   119.96       SUBAREA RUNOFF(CFS) =  109.17
  EFFECTIVE AREA(ACRES) =   3460.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4926.2         PEAK FLOW RATE(CFS) =    3487.35
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.78   FLOW VELOCITY(FEET/SEC.) =  14.42
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11342.00 =   31396.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1017.16  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1557.63   CHANNEL SLOPE =  0.0383
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.94
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.279
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.25      0.30     0.990     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3525.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.15
  AVERAGE FLOW DEPTH(FEET) =   8.94   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   32.06
  SUBAREA AREA(ACRES) =    85.25       SUBAREA RUNOFF(CFS) =   75.35
```



```
  EFFECTIVE AREA(ACRES) =   3545.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5011.5         PEAK FLOW RATE(CFS) =    3487.35
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.89   FLOW VELOCITY(FEET/SEC.) =  14.11
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   32.06
  RAINFALL INTENSITY(INCH/HR) =   1.28
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3545.32
  TOTAL STREAM AREA(ACRES) =    5011.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    3487.35

****************************************************************************
  FLOW PROCESS FROM NODE  11350.00 TO NODE  11351.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.54
  ELEVATION DATA: UPSTREAM(FEET) =   2805.98  DOWNSTREAM(FEET) =   2583.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.655
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.056
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.40      0.30     1.000     0   14.66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.53
  TOTAL AREA(ACRES) =      5.40   PEAK FLOW RATE(CFS) =      8.53

****************************************************************************
  FLOW PROCESS FROM NODE  11351.00 TO NODE  11352.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2583.16  DOWNSTREAM(FEET) =   2403.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.57   CHANNEL SLOPE =  0.1876
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.840
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.11
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   3.12
  Tc(MIN.) =   17.78
  SUBAREA AREA(ACRES) =    15.56       SUBAREA RUNOFF(CFS) =   21.57
  EFFECTIVE AREA(ACRES) =     20.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.0         PEAK FLOW RATE(CFS) =      29.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   5.88
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11352.00 =    1907.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11352.00 TO NODE  11353.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2403.73  DOWNSTREAM(FEET) =   1786.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.85   CHANNEL SLOPE =  0.3190
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.665
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       74.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.77
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   21.08
  SUBAREA AREA(ACRES) =    74.05       SUBAREA RUNOFF(CFS) =   91.00
  EFFECTIVE AREA(ACRES) =     95.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       95.0         PEAK FLOW RATE(CFS) =     116.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =  11.39
```



```
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11353.00 =    3840.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11353.00 TO NODE  11354.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1786.74  DOWNSTREAM(FEET) =   1308.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2073.35   CHANNEL SLOPE =  0.2307
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.519
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     139.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.88
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   3.18
  Tc(MIN.) =   24.25
  SUBAREA AREA(ACRES) =    41.22       SUBAREA RUNOFF(CFS) =   45.24
  EFFECTIVE AREA(ACRES) =    136.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      136.2         PEAK FLOW RATE(CFS) =     149.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =  11.10
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11354.00 =    5914.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.39  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2455.49   CHANNEL SLOPE =  0.1429
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.73
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.384
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      201.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     248.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.04
  AVERAGE FLOW DEPTH(FEET) =   1.68   TRAVEL TIME(MIN.) =   3.71
  Tc(MIN.) =   27.96
```

```
  SUBAREA AREA(ACRES) =   201.53       SUBAREA RUNOFF(CFS) =  196.68
  EFFECTIVE AREA(ACRES) =    337.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      337.8         PEAK FLOW RATE(CFS) =     329.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.97   FLOW VELOCITY(FEET/SEC.) =  12.04
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11360.00 =    8369.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.96
  RAINFALL INTENSITY(INCH/HR) =   1.38
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     337.76
  TOTAL STREAM AREA(ACRES) =     337.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     329.63

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3394.84   26.28    1.441  0.30( 0.30) 1.00    2890.9   11330.00
      1     3487.35   32.06    1.279  0.30( 0.30) 1.00    3545.3   11300.00
      1     3476.97   33.51    1.254  0.30( 0.30) 1.00    3698.0   11250.00
      1     3466.65   34.14    1.243  0.30( 0.30) 1.00    3751.3   11130.00
      1     3462.56   34.37    1.239  0.30( 0.30) 1.00    3769.1   11220.00
      1     3181.63   52.57    0.999  0.30( 0.30) 1.00    4973.7   11111.00
      1     3167.63   53.33    0.993  0.30( 0.30) 1.00    5009.5   11101.00
      1     3165.14   53.40    0.992  0.30( 0.30) 1.00    5011.5   11201.00
      2      329.63   27.96    1.384  0.30( 0.30) 1.00     337.8   11350.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3720.99   26.28    1.441  0.30( 0.30) 1.00    3208.4   11330.00
      2     3751.35   27.96    1.384  0.30( 0.30) 1.00    3418.8   11350.00
      3     3784.97   32.06    1.279  0.30( 0.30) 1.00    3883.1   11300.00
      4     3766.85   33.51    1.254  0.30( 0.30) 1.00    4035.8   11250.00
      5     3753.18   34.14    1.243  0.30( 0.30) 1.00    4089.0   11130.00
      6     3747.87   34.37    1.239  0.30( 0.30) 1.00    4106.8   11220.00
      7     3394.26   52.57    0.999  0.30( 0.30) 1.00    5311.5   11111.00
      8     3378.33   53.33    0.993  0.30( 0.30) 1.00    5347.3   11101.00
      9     3375.65   53.40    0.992  0.30( 0.30) 1.00    5349.2   11201.00
```



```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    3784.97    Tc(MIN.) =    32.06
  EFFECTIVE AREA(ACRES) =    3883.08   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5349.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11360.00 TO NODE  11361.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    957.53  DOWNSTREAM(FEET) =    847.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2937.03   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.219
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      176.74      0.30     0.977     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3858.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.36
  AVERAGE FLOW DEPTH(FEET) =   9.36   TRAVEL TIME(MIN.) =   3.41
  Tc(MIN.) =   35.47
  SUBAREA AREA(ACRES) =   176.74       SUBAREA RUNOFF(CFS) =  147.34
  EFFECTIVE AREA(ACRES) =   4059.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5526.0         PEAK FLOW RATE(CFS) =    3784.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.28   FLOW VELOCITY(FEET/SEC.) =  14.28
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11361.00 =   35891.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11361.00 TO NODE  11362.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    847.62  DOWNSTREAM(FEET) =    738.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3869.90   CHANNEL SLOPE =  0.0283
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.12
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.135
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      429.50      0.30     0.995     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3946.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.00
  AVERAGE FLOW DEPTH(FEET) =  10.07   TRAVEL TIME(MIN.) =   4.96
  Tc(MIN.) =   40.43
  SUBAREA AREA(ACRES) =   429.50       SUBAREA RUNOFF(CFS) =  323.33
  EFFECTIVE AREA(ACRES) =   4489.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5955.5          PEAK FLOW RATE(CFS) =    3784.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.88   FLOW VELOCITY(FEET/SEC.) =  12.86
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11362.00 =   39761.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    738.28  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2987.23   CHANNEL SLOPE =  0.0199
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.76
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.083
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.97      0.30     0.991     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.991
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3829.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.31
  AVERAGE FLOW DEPTH(FEET) =  10.75   TRAVEL TIME(MIN.) =   4.40
  Tc(MIN.) =   44.83
  SUBAREA AREA(ACRES) =   125.97       SUBAREA RUNOFF(CFS) =   89.03
  EFFECTIVE AREA(ACRES) =   4615.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6081.5          PEAK FLOW RATE(CFS) =    3784.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.69   FLOW VELOCITY(FEET/SEC.) =  11.28
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11363.00 =   42748.42 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     6081.5  TC(MIN.) =     44.83
  EFFECTIVE AREA(ACRES) =   4615.29  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.998
```



```
  PEAK FLOW RATE(CFS)   =    3784.97

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3720.99   39.10    1.156  0.30( 0.30) 1.00    3940.6   11330.00
      2     3751.35   40.76    1.131  0.30( 0.30) 1.00    4151.1   11350.00
      3     3784.97   44.83    1.083  0.30( 0.30) 1.00    4615.3   11300.00
      4     3766.85   46.31    1.065  0.30( 0.30) 1.00    4768.0   11250.00
      5     3753.18   46.95    1.057  0.30( 0.30) 1.00    4821.2   11130.00
      6     3747.87   47.18    1.055  0.30( 0.30) 1.00    4839.0   11220.00
      7     3394.26   65.72    0.910  0.30( 0.30) 1.00    6043.7   11111.00
      8     3378.33   66.49    0.906  0.30( 0.30) 1.00    6079.5   11101.00
      9     3375.65   66.57    0.906  0.30( 0.30) 1.00    6081.5   11201.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:
```

```
--------------------------------------------------------------------------
  FILE NAME: S14.DAT
  TIME/DATE OF STUDY: 10:23 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.325
   2)   10.00;  2.819
   3)   15.00;  1.985
   4)   20.00;  1.704
   5)   25.00;  1.476
   6)   30.00;  1.309
   7)   40.00;  1.133
   8)   50.00;  1.014
   9)   60.00;  0.931
  10)   90.00;  0.787
  11)  120.00;  0.710
  12)  180.00;  0.604
  13)  360.00;  0.461
  14) 1440.00;  0.206
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11401.00 TO NODE  11401.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   313.41
  ELEVATION DATA: UPSTREAM(FEET) =   3384.11  DOWNSTREAM(FEET) =   3232.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.137
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.380
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.25      0.30     1.000     0    8.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.24
  TOTAL AREA(ACRES) =      2.25   PEAK FLOW RATE(CFS) =      6.24

**************************************************************************
  FLOW PROCESS FROM NODE  11401.50 TO NODE  11402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3232.76  DOWNSTREAM(FEET) =   3001.05
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.75   CHANNEL SLOPE =  0.3733
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.31
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.888
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.34
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.63
  Tc(MIN.) =    9.77
  SUBAREA AREA(ACRES) =    11.39       SUBAREA RUNOFF(CFS) =   26.53
  EFFECTIVE AREA(ACRES) =     13.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.6          PEAK FLOW RATE(CFS) =      31.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   7.64
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11402.00 =     934.16 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11402.00 TO NODE  11403.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3001.05  DOWNSTREAM(FEET) =   2787.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.99   CHANNEL SLOPE =  0.2213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.67
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.523
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.00
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =   11.78
  SUBAREA AREA(ACRES) =    26.43       SUBAREA RUNOFF(CFS) =   52.87
  EFFECTIVE AREA(ACRES) =     40.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =      80.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   8.88
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11403.00 =    1897.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11403.00 TO NODE  11404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2787.96  DOWNSTREAM(FEET) =   2518.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1956.80   CHANNEL SLOPE =  0.1376
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.27
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.961
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       67.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     131.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.94
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   3.65
  Tc(MIN.) =   15.42
  SUBAREA AREA(ACRES) =    67.85       SUBAREA RUNOFF(CFS) =  101.44
  EFFECTIVE AREA(ACRES) =    107.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.9         PEAK FLOW RATE(CFS) =     161.35
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.33   FLOW VELOCITY(FEET/SEC.) =   9.56
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11404.00 =    3853.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11404.00 TO NODE  11405.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2518.71  DOWNSTREAM(FEET) =   2304.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.99   CHANNEL SLOPE =  0.1101
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.772
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     214.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.66
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   3.36
  Tc(MIN.) =   18.78
  SUBAREA AREA(ACRES) =    80.61       SUBAREA RUNOFF(CFS) =  106.83
  EFFECTIVE AREA(ACRES) =    188.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      188.5         PEAK FLOW RATE(CFS) =     249.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =  10.11
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11405.00 =    5798.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11405.00 TO NODE  11406.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2304.57  DOWNSTREAM(FEET) =   1888.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3280.59   CHANNEL SLOPE =  0.1270
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.01
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.540
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      111.04      0.30     1.000     -
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     311.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.35
  AVERAGE FLOW DEPTH(FEET) =   1.97   TRAVEL TIME(MIN.) =   4.82
  Tc(MIN.) =   23.60
  SUBAREA AREA(ACRES) =   111.04       SUBAREA RUNOFF(CFS) =  123.92
  EFFECTIVE AREA(ACRES) =    299.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      299.6          PEAK FLOW RATE(CFS) =     334.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.05   FLOW VELOCITY(FEET/SEC.) =  11.58
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11406.00 =    9079.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11406.00 TO NODE  11407.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1888.00  DOWNSTREAM(FEET) =   1539.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2842.33   CHANNEL SLOPE =  0.1226
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.392
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     403.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.12
  AVERAGE FLOW DEPTH(FEET) =   2.29   TRAVEL TIME(MIN.) =   3.91
  Tc(MIN.) =   27.51
  SUBAREA AREA(ACRES) =   141.19       SUBAREA RUNOFF(CFS) =  138.80
  EFFECTIVE AREA(ACRES) =    440.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      440.8          PEAK FLOW RATE(CFS) =     433.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.38   FLOW VELOCITY(FEET/SEC.) =  12.35
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11407.00 =   11921.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11407.00 TO NODE  11408.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   1539.46  DOWNSTREAM(FEET) =   1268.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2859.01   CHANNEL SLOPE =  0.0948
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.78
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.282
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      158.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     503.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.77
  AVERAGE FLOW DEPTH(FEET) =   2.76   TRAVEL TIME(MIN.) =   4.05
  Tc(MIN.) =   31.56
  SUBAREA AREA(ACRES) =   158.63       SUBAREA RUNOFF(CFS) =  140.15
  EFFECTIVE AREA(ACRES) =    599.39     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      599.4          PEAK FLOW RATE(CFS) =     529.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.83   FLOW VELOCITY(FEET/SEC.) =  11.93
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11408.00 =   14780.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11408.00 TO NODE  11409.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1268.36  DOWNSTREAM(FEET) =   1109.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2883.36   CHANNEL SLOPE =  0.0550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.55
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.199
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      208.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     613.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.21
  AVERAGE FLOW DEPTH(FEET) =   3.53   TRAVEL TIME(MIN.) =   4.71
  Tc(MIN.) =   36.26
  SUBAREA AREA(ACRES) =   208.66       SUBAREA RUNOFF(CFS) =  168.79
  EFFECTIVE AREA(ACRES) =    808.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      808.1          PEAK FLOW RATE(CFS) =     653.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.64
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.64   FLOW VELOCITY(FEET/SEC.) =  10.38
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.00 =   17664.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.00 TO NODE  11409.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1109.80  DOWNSTREAM(FEET) =    953.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2734.25   CHANNEL SLOPE =  0.0572
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.127
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       97.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     689.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.70
  AVERAGE FLOW DEPTH(FEET) =   3.71   TRAVEL TIME(MIN.) =   4.26
  Tc(MIN.) =   40.52
  SUBAREA AREA(ACRES) =    97.66       SUBAREA RUNOFF(CFS) =   72.67
  EFFECTIVE AREA(ACRES) =    905.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      905.7         PEAK FLOW RATE(CFS) =     673.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.66   FLOW VELOCITY(FEET/SEC.) =  10.64
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.50 =   20398.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.50 TO NODE  11410.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    953.45  DOWNSTREAM(FEET) =    914.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.66   CHANNEL SLOPE =  0.0357
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.28
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.103
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      130.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     721.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.12
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  AVERAGE FLOW DEPTH(FEET) =   4.27   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =   42.54
  SUBAREA AREA(ACRES) =   130.64       SUBAREA RUNOFF(CFS) =   94.40
  EFFECTIVE AREA(ACRES) =   1036.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1036.4         PEAK FLOW RATE(CFS) =     748.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.35   FLOW VELOCITY(FEET/SEC.) =   9.20
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11410.00 =   21499.14 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11410.00 TO NODE  11411.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    914.20  DOWNSTREAM(FEET) =    740.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3015.96   CHANNEL SLOPE =  0.0576
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.12
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.050
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      299.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     850.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.35
  AVERAGE FLOW DEPTH(FEET) =   4.11   TRAVEL TIME(MIN.) =   4.43
  Tc(MIN.) =   46.96
  SUBAREA AREA(ACRES) =   299.66       SUBAREA RUNOFF(CFS) =  202.32
  EFFECTIVE AREA(ACRES) =   1336.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1336.0         PEAK FLOW RATE(CFS) =     902.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.24   FLOW VELOCITY(FEET/SEC.) =  11.52
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11411.00 =   24515.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.43  DOWNSTREAM(FEET) =    651.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1605.97   CHANNEL SLOPE =  0.0553
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
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 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.34
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.022
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       70.41      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     924.93
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.44
 AVERAGE FLOW DEPTH(FEET) =   4.33   TRAVEL TIME(MIN.) =   2.34
 Tc(MIN.) =   49.30
 SUBAREA AREA(ACRES) =    70.41       SUBAREA RUNOFF(CFS) =   45.78
 EFFECTIVE AREA(ACRES) =   1406.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1406.4         PEAK FLOW RATE(CFS) =     914.35
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.31

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.31   FLOW VELOCITY(FEET/SEC.) =  11.40
 LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11431.00 =   26121.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S10.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     7096.15   26.91  0.30( 0.30) 1.00    4071.8   11000.00
     2     8393.69   40.90  0.30( 0.30) 1.00    7153.8   10850.00
     3     8410.55   42.07  0.30( 0.30) 1.00    7409.3   10800.00
     4     8670.77   44.21  0.30( 0.30) 1.00    8006.0   10900.00
     5     8971.09   47.38  0.30( 0.30) 1.00    8798.5   10830.00
     6     8976.04   47.45  0.30( 0.30) 1.00    8814.4   10910.00
     7     9012.86   48.33  0.30( 0.30) 1.00    8980.9   10630.00
     8     8980.68   60.88  0.30( 0.30) 1.00   11458.6   10600.00
     9     9045.59   68.49  0.30( 0.30) 1.00   12988.5   10500.00
    10     9068.15   72.66  0.30( 0.30) 1.00   13777.9   10710.00
    11     9039.09   75.18  0.30( 0.30) 1.00   14164.6   10410.00
    12     8951.73   80.46  0.30( 0.30) 1.00   14877.7   10700.00
    13     8840.13   86.68  0.30( 0.30) 1.00   15657.7   10400.00
    14     8728.45   90.23  0.30( 0.30) 1.00   16031.5   10200.00
    15     8526.59   97.00  0.30( 0.30) 1.00   16650.9   10320.00
    16     8519.93   97.15  0.30( 0.30) 1.00   16660.7   10300.00
    17     8277.74  101.26  0.30( 0.30) 1.00   16813.1   10210.00
    18     7054.21  131.50  0.30( 0.30) 1.00   17533.1   10100.00
  TOTAL AREA(ACRES) =    17533.1
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****************************************************************************
 FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S13.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     3720.99   39.10  0.30( 0.30) 1.00    3940.6   11330.00
     2     3751.35   40.76  0.30( 0.30) 1.00    4151.1   11350.00
     3     3784.97   44.83  0.30( 0.30) 1.00    4615.3   11300.00
     4     3766.85   46.31  0.30( 0.30) 1.00    4768.0   11250.00
     5     3753.18   46.95  0.30( 0.30) 1.00    4821.2   11130.00
     6     3747.87   47.18  0.30( 0.30) 1.00    4839.0   11220.00
     7     3394.26   65.72  0.30( 0.30) 1.00    6043.7   11111.00
     8     3378.33   66.49  0.30( 0.30) 1.00    6079.5   11101.00
     9     3375.65   66.57  0.30( 0.30) 1.00    6081.5   11201.00
  TOTAL AREA(ACRES) =     6081.5

****************************************************************************
 FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     3720.99   39.10  0.30( 0.30) 1.00    3940.6   11330.00
     2     3751.35   40.76  0.30( 0.30) 1.00    4151.1   11350.00
     3     3784.97   44.83  0.30( 0.30) 1.00    4615.3   11300.00
     4     3766.85   46.31  0.30( 0.30) 1.00    4768.0   11250.00
     5     3753.18   46.95  0.30( 0.30) 1.00    4821.2   11130.00
     6     3747.87   47.18  0.30( 0.30) 1.00    4839.0   11220.00
     7     3394.26   65.72  0.30( 0.30) 1.00    6043.7   11111.00
     8     3378.33   66.49  0.30( 0.30) 1.00    6079.5   11101.00
     9     3375.65   66.57  0.30( 0.30) 1.00    6081.5   11201.00
  TOTAL AREA(ACRES) =      6081.5

****************************************************************************
 FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3720.99   39.10    1.149  0.30( 0.30) 1.00    3940.6   11330.00
     2     3751.35   40.76    1.124  0.30( 0.30) 1.00    4151.1   11350.00
     3     3784.97   44.83    1.076  0.30( 0.30) 1.00    4615.3   11300.00
     4     3766.85   46.31    1.058  0.30( 0.30) 1.00    4768.0   11250.00
     5     3753.18   46.95    1.050  0.30( 0.30) 1.00    4821.2   11130.00
     6     3747.87   47.18    1.048  0.30( 0.30) 1.00    4839.0   11220.00
     7     3394.26   65.72    0.904  0.30( 0.30) 1.00    6043.7   11111.00
     8     3378.33   66.49    0.900  0.30( 0.30) 1.00    6079.5   11101.00
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9	3375.65	66.57	0.899	0.30(0.30)	1.00	6081.5	11201.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7096.15	26.91	1.412	0.30(0.30)	1.00	4071.8	11000.00
2	8393.69	40.90	1.122	0.30(0.30)	1.00	7153.8	10850.00
3	8410.55	42.07	1.108	0.30(0.30)	1.00	7409.3	10800.00
4	8670.77	44.21	1.083	0.30(0.30)	1.00	8006.0	10900.00
5	8971.09	47.38	1.045	0.30(0.30)	1.00	8798.5	10830.00
6	8976.04	47.45	1.044	0.30(0.30)	1.00	8814.4	10910.00
7	9012.86	48.33	1.034	0.30(0.30)	1.00	8980.9	10630.00
8	8980.68	60.88	0.927	0.30(0.30)	1.00	11458.6	10600.00
9	9045.59	68.49	0.890	0.30(0.30)	1.00	12988.5	10500.00
10	9068.15	72.66	0.870	0.30(0.30)	1.00	13777.9	10710.00
11	9039.09	75.18	0.858	0.30(0.30)	1.00	14164.6	10410.00
12	8951.73	80.46	0.833	0.30(0.30)	1.00	14877.7	10700.00
13	8840.13	86.68	0.803	0.30(0.30)	1.00	15657.7	10400.00
14	8728.45	90.23	0.786	0.30(0.30)	1.00	16031.5	10200.00
15	8526.59	97.00	0.769	0.30(0.30)	1.00	16650.9	10320.00
16	8519.93	97.15	0.769	0.30(0.30)	1.00	16660.7	10300.00
17	8277.74	101.26	0.758	0.30(0.30)	1.00	16813.1	10210.00
18	7054.21	131.50	0.690	0.30(0.30)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10451.03	26.91	1.412	0.30(0.30)	1.00	6784.0	11000.00
2	11948.31	39.10	1.149	0.30(0.30)	1.00	10699.3	11330.00
3	12132.03	40.76	1.124	0.30(0.30)	1.00	11273.9	11350.00
4	12146.20	40.90	1.122	0.30(0.30)	1.00	11320.8	10850.00
5	12172.72	42.07	1.108	0.30(0.30)	1.00	11709.7	10800.00
6	12450.58	44.21	1.083	0.30(0.30)	1.00	12550.0	10900.00
7	12514.90	44.83	1.076	0.30(0.30)	1.00	12777.4	11300.00
8	12636.64	46.31	1.058	0.30(0.30)	1.00	13299.2	11250.00
9	12683.24	46.95	1.050	0.30(0.30)	1.00	13511.5	11130.00
10	12700.15	47.18	1.048	0.30(0.30)	1.00	13587.9	11220.00
11	12715.17	47.38	1.045	0.30(0.30)	1.00	13650.4	10830.00
12	12718.75	47.45	1.044	0.30(0.30)	1.00	13671.0	10910.00
13	12738.88	48.33	1.034	0.30(0.30)	1.00	13894.3	10630.00
14	12467.24	60.88	0.927	0.30(0.30)	1.00	17187.8	10600.00
15	12416.19	65.72	0.904	0.30(0.30)	1.00	18474.6	11111.00
16	12406.81	66.49	0.900	0.30(0.30)	1.00	18664.5	11101.00
17	12404.85	66.57	0.899	0.30(0.30)	1.00	18683.4	11201.00
18	12369.29	68.49	0.890	0.30(0.30)	1.00	19070.0	10500.00
19	12279.22	72.66	0.870	0.30(0.30)	1.00	19859.4	10710.00
20	12182.13	75.18	0.858	0.30(0.30)	1.00	20246.0	10410.00
21	11952.15	80.46	0.833	0.30(0.30)	1.00	20959.1	10700.00
22	11672.67	86.68	0.803	0.30(0.30)	1.00	21739.2	10400.00
23	11468.01	90.23	0.786	0.30(0.30)	1.00	22112.9	10200.00
24	11168.37	97.00	0.769	0.30(0.30)	1.00	22732.4	10320.00
25	11159.55	97.15	0.769	0.30(0.30)	1.00	22742.2	10300.00
26	10857.92	101.26	0.758	0.30(0.30)	1.00	22894.6	10210.00
27	9249.55	131.50	0.690	0.30(0.30)	1.00	23614.5	10100.00

TOTAL AREA(ACRES) = 23614.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 12738.88 Tc(MIN.) = 48.325
EFFECTIVE AREA(ACRES) = 13894.35 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 23614.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

****
FLOW PROCESS FROM NODE 11363.00 TO NODE 11431.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 678.93 DOWNSTREAM(FEET) = 651.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 2069.94 CHANNEL SLOPE = 0.0132
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.29
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.007
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.16	0.30	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12791.51
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.79
AVERAGE FLOW DEPTH(FEET) = 13.28 TRAVEL TIME(MIN.) = 2.50
Tc(MIN.) = 50.83
SUBAREA AREA(ACRES) = 165.16 SUBAREA RUNOFF(CFS) = 105.26
EFFECTIVE AREA(ACRES) = 14059.51 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 23779.7 PEAK FLOW RATE(CFS) = 12738.88
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 13.26 FLOW VELOCITY(FEET/SEC.) = 13.78
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

****
FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10451.03	29.55	1.324	0.30(0.30)	1.00	6949.2	11000.00
2	11948.31	41.65	1.113	0.30(0.30)	1.00	10864.4	11330.00
3	12132.03	43.29	1.094	0.30(0.30)	1.00	11439.1	11350.00
4	12146.20	43.43	1.092	0.30(0.30)	1.00	11486.0	10850.00
5	12172.72	44.60	1.078	0.30(0.30)	1.00	11874.8	10800.00
6	12450.58	46.72	1.053	0.30(0.30)	1.00	12715.2	10900.00
7	12514.90	47.34	1.046	0.30(0.30)	1.00	12942.5	11300.00

8	12636.64	48.82	1.028	0.30(0.30)	1.00	13464.3	11250.00
9	12683.24	49.45	1.021	0.30(0.30)	1.00	13676.7	11130.00
10	12700.15	49.68	1.018	0.30(0.30)	1.00	13753.1	11220.00
11	12715.17	49.88	1.015	0.30(0.30)	1.00	13815.6	10830.00
12	12718.75	49.95	1.015	0.30(0.30)	1.00	13836.2	10910.00
13	12738.88	50.83	1.007	0.30(0.30)	1.00	14059.5	10630.00
14	12467.24	63.40	0.915	0.30(0.30)	1.00	17352.9	10600.00
15	12416.19	68.24	0.891	0.30(0.30)	1.00	18639.7	11111.00
16	12406.81	69.01	0.888	0.30(0.30)	1.00	18829.7	11101.00
17	12404.85	69.09	0.887	0.30(0.30)	1.00	18848.6	11201.00
18	12369.29	71.02	0.878	0.30(0.30)	1.00	19235.1	10500.00
19	12279.22	75.19	0.858	0.30(0.30)	1.00	20024.5	10710.00
20	12182.13	77.71	0.846	0.30(0.30)	1.00	20411.2	10410.00
21	11952.15	83.01	0.821	0.30(0.30)	1.00	21124.3	10700.00
22	11672.67	89.24	0.791	0.30(0.30)	1.00	21904.3	10400.00
23	11468.01	92.80	0.780	0.30(0.30)	1.00	22278.1	10200.00
24	11168.37	99.59	0.762	0.30(0.30)	1.00	22897.5	10320.00
25	11159.55	99.74	0.762	0.30(0.30)	1.00	22907.4	10300.00
26	10857.92	103.87	0.751	0.30(0.30)	1.00	23059.7	10210.00
27	9249.55	134.22	0.685	0.30(0.30)	1.00	23779.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	914.35	49.30	1.022	0.30(0.30)	1.00	1406.4	11401.00

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11227.96	29.55	1.324	0.30(0.30)	1.00	7792.1	11000.00
2	12818.09	41.65	1.113	0.30(0.30)	1.00	12052.5	11330.00
3	13014.39	43.29	1.094	0.30(0.30)	1.00	12674.0	11350.00
4	13029.55	43.43	1.092	0.30(0.30)	1.00	12724.9	10850.00
5	13063.92	44.60	1.078	0.30(0.30)	1.00	13147.0	10800.00
6	13353.90	46.72	1.053	0.30(0.30)	1.00	14048.0	10900.00
7	13421.25	47.34	1.046	0.30(0.30)	1.00	14293.1	11300.00
8	13549.22	48.82	1.028	0.30(0.30)	1.00	14856.8	11250.00
9	13586.79	49.30	1.022	0.30(0.30)	1.00	15033.9	11401.00
10	13595.38	49.45	1.021	0.30(0.30)	1.00	15083.1	11130.00
11	13608.77	49.68	1.018	0.30(0.30)	1.00	15159.5	11220.00
12	13620.80	49.88	1.015	0.30(0.30)	1.00	15222.0	10830.00
13	13623.31	49.95	1.015	0.30(0.30)	1.00	15242.6	10910.00
14	13634.05	50.83	1.007	0.30(0.30)	1.00	15465.9	10630.00
15	13245.41	63.40	0.915	0.30(0.30)	1.00	18759.4	10600.00
16	13164.94	68.24	0.891	0.30(0.30)	1.00	20046.1	11111.00
17	13150.89	69.01	0.888	0.30(0.30)	1.00	20236.1	11101.00
18	13148.41	69.09	0.887	0.30(0.30)	1.00	20255.0	11201.00
19	13101.15	71.02	0.878	0.30(0.30)	1.00	20641.5	10500.00
20	12985.72	75.19	0.858	0.30(0.30)	1.00	21430.9	10710.00
21	12873.29	77.71	0.846	0.30(0.30)	1.00	21817.6	10410.00
22	12611.15	83.01	0.821	0.30(0.30)	1.00	22530.7	10700.00
23	12293.81	89.24	0.791	0.30(0.30)	1.00	23310.8	10400.00
24	12075.44	92.80	0.780	0.30(0.30)	1.00	23684.5	10200.00
25	11753.74	99.59	0.762	0.30(0.30)	1.00	24304.0	10320.00
26	11744.43	99.74	0.762	0.30(0.30)	1.00	24313.8	10300.00
27	11429.36	103.87	0.751	0.30(0.30)	1.00	24466.1	10210.00

28	9736.81	134.22	0.685	0.30(0.30)	1.00	25186.1	10100.00

TOTAL AREA(ACRES) = 25186.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 13634.05 Tc(MIN.) = 50.827
EFFECTIVE AREA(ACRES) = 15465.93 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25186.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 25186.1 TC(MIN.) = 50.83
EFFECTIVE AREA(ACRES) = 15465.93 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999
PEAK FLOW RATE(CFS) = 13634.05

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11227.96	29.55	1.324	0.30(0.30)	1.00	7792.1	11000.00
2	12818.09	41.65	1.113	0.30(0.30)	1.00	12052.5	11330.00
3	13014.39	43.29	1.094	0.30(0.30)	1.00	12674.0	11350.00
4	13029.55	43.43	1.092	0.30(0.30)	1.00	12724.9	10850.00
5	13063.92	44.60	1.078	0.30(0.30)	1.00	13147.0	10800.00
6	13353.90	46.72	1.053	0.30(0.30)	1.00	14048.0	10900.00
7	13421.25	47.34	1.046	0.30(0.30)	1.00	14293.1	11300.00
8	13549.22	48.82	1.028	0.30(0.30)	1.00	14856.8	11250.00
9	13586.79	49.30	1.022	0.30(0.30)	1.00	15033.9	11401.00
10	13595.38	49.45	1.021	0.30(0.30)	1.00	15083.1	11130.00
11	13608.77	49.68	1.018	0.30(0.30)	1.00	15159.5	11220.00
12	13620.80	49.88	1.015	0.30(0.30)	1.00	15222.0	10830.00
13	13623.31	49.95	1.015	0.30(0.30)	1.00	15242.6	10910.00
14	13634.05	50.83	1.007	0.30(0.30)	1.00	15465.9	10630.00
15	13245.41	63.40	0.915	0.30(0.30)	1.00	18759.4	10600.00
16	13164.94	68.24	0.891	0.30(0.30)	1.00	20046.1	11111.00
17	13150.89	69.01	0.888	0.30(0.30)	1.00	20236.1	11101.00
18	13148.41	69.09	0.887	0.30(0.30)	1.00	20255.0	11201.00
19	13101.15	71.02	0.878	0.30(0.30)	1.00	20641.5	10500.00
20	12985.72	75.19	0.858	0.30(0.30)	1.00	21430.9	10710.00
21	12873.29	77.71	0.846	0.30(0.30)	1.00	21817.6	10410.00
22	12611.15	83.01	0.821	0.30(0.30)	1.00	22530.7	10700.00
23	12293.81	89.24	0.791	0.30(0.30)	1.00	23310.8	10400.00
24	12075.44	92.80	0.780	0.30(0.30)	1.00	23684.5	10200.00
25	11753.74	99.59	0.762	0.30(0.30)	1.00	24304.0	10320.00
26	11744.43	99.74	0.762	0.30(0.30)	1.00	24313.8	10300.00
27	11429.36	103.87	0.751	0.30(0.30)	1.00	24466.1	10210.00
28	9736.81	134.22	0.685	0.30(0.30)	1.00	25186.1	10100.00

==========

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END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S15.DAT
  TIME/DATE OF STUDY: 10:23 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.159
   2)   10.00;  2.728
   3)   15.00;  1.948
   4)   20.00;  1.671
   5)   25.00;  1.451
   6)   30.00;  1.291
   7)   40.00;  1.114
   8)   50.00;  0.995
   9)   60.00;  0.910
  10)   90.00;  0.765
  11)  120.00;  0.686
  12)  180.00;  0.581
  13)  360.00;  0.439
  14) 1440.00;  0.195
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11500.00 TO NODE  11501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   352.85
  ELEVATION DATA: UPSTREAM(FEET) =   1891.25  DOWNSTREAM(FEET) =   1665.22

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.064
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.282
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        1.58      0.30     1.000     0    8.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.24
  TOTAL AREA(ACRES) =      1.58   PEAK FLOW RATE(CFS) =      4.24

**************************************************************************
  FLOW PROCESS FROM NODE  11501.00 TO NODE  11502.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1665.22  DOWNSTREAM(FEET) =   1423.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.67   CHANNEL SLOPE =  0.3849
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.23
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.725
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.35
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   1.95
  Tc(MIN.) =   10.02
  SUBAREA AREA(ACRES) =     6.84       SUBAREA RUNOFF(CFS) =   14.93
  EFFECTIVE AREA(ACRES) =      8.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.4          PEAK FLOW RATE(CFS) =      18.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   6.27
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11502.00 =     980.52 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11502.00 TO NODE  11503.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1423.64  DOWNSTREAM(FEET) =   1258.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   937.16   CHANNEL SLOPE =  0.1758
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.63
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.364
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.74
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   2.32
  Tc(MIN.) =   12.33
  SUBAREA AREA(ACRES) =    28.16       SUBAREA RUNOFF(CFS) =   52.31
  EFFECTIVE AREA(ACRES) =     36.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       36.6         PEAK FLOW RATE(CFS) =      67.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   7.78
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11503.00 =    1917.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11503.00 TO NODE  11504.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1258.86  DOWNSTREAM(FEET) =   1009.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.29   CHANNEL SLOPE =  0.1298
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.886
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     117.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.48
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   3.78
  Tc(MIN.) =   16.12
  SUBAREA AREA(ACRES) =    69.67       SUBAREA RUNOFF(CFS) =   99.45
  EFFECTIVE AREA(ACRES) =    106.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.2         PEAK FLOW RATE(CFS) =     151.67
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   9.18
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11504.00 =    3841.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1009.04  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2817.91   CHANNEL SLOPE =  0.1475
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.47
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.641
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       65.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     191.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.31
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   4.56
  Tc(MIN.) =   20.67
  SUBAREA AREA(ACRES) =    65.12       SUBAREA RUNOFF(CFS) =   78.62
  EFFECTIVE AREA(ACRES) =    171.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.4         PEAK FLOW RATE(CFS) =     206.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =  10.56
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S14.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    11227.96   29.55  0.30( 0.30) 1.00    7792.1   11000.00
```

```
      2    12818.09   41.65  0.30( 0.30) 1.00   12052.5   11330.00
      3    13029.55   43.43  0.30( 0.30) 1.00   12724.9   10850.00
      4    13063.92   44.60  0.30( 0.30) 1.00   13147.0   10800.00
      5    13353.90   46.72  0.30( 0.30) 1.00   14048.0   10900.00
      6    13421.25   47.34  0.30( 0.30) 1.00   14293.1   11300.00
      7    13623.31   49.95  0.30( 0.30) 1.00   15242.6   10910.00
      8    13634.05   50.83  0.30( 0.30) 1.00   15465.9   10630.00
      9    13245.41   63.40  0.30( 0.30) 1.00   18759.4   10600.00
     10    13164.94   68.24  0.30( 0.30) 1.00   20046.1   11111.00
     11    13150.89   69.01  0.30( 0.30) 1.00   20236.1   11101.00
     12    13101.15   71.02  0.30( 0.30) 1.00   20641.5   10500.00
     13    12985.72   75.19  0.30( 0.30) 1.00   21430.9   10710.00
     14    12873.29   77.71  0.30( 0.30) 1.00   21817.6   10410.00
     15    12611.15   83.01  0.30( 0.30) 1.00   22530.7   10700.00
     16    12293.81   89.24  0.30( 0.30) 1.00   23310.8   10400.00
     17    12075.44   92.80  0.30( 0.30) 1.00   23684.5   10200.00
     18    11753.74   99.59  0.30( 0.30) 1.00   24304.0   10320.00
     19    11429.36  103.87  0.30( 0.30) 1.00   24466.1   10210.00
     20     9736.81  134.22  0.30( 0.30) 1.00   25186.1   10100.00
   TOTAL AREA(ACRES) =    25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    11227.96   29.55  0.30( 0.30) 1.00    7792.1   11000.00
      2    12818.09   41.65  0.30( 0.30) 1.00   12052.5   11330.00
      3    13029.55   43.43  0.30( 0.30) 1.00   12724.9   10850.00
      4    13063.92   44.60  0.30( 0.30) 1.00   13147.0   10800.00
      5    13353.90   46.72  0.30( 0.30) 1.00   14048.0   10900.00
      6    13421.25   47.34  0.30( 0.30) 1.00   14293.1   11300.00
      7    13623.31   49.95  0.30( 0.30) 1.00   15242.6   10910.00
      8    13634.05   50.83  0.30( 0.30) 1.00   15465.9   10630.00
      9    13245.41   63.40  0.30( 0.30) 1.00   18759.4   10600.00
     10    13164.94   68.24  0.30( 0.30) 1.00   20046.1   11111.00
     11    13150.89   69.01  0.30( 0.30) 1.00   20236.1   11101.00
     12    13101.15   71.02  0.30( 0.30) 1.00   20641.5   10500.00
     13    12985.72   75.19  0.30( 0.30) 1.00   21430.9   10710.00
     14    12873.29   77.71  0.30( 0.30) 1.00   21817.6   10410.00
     15    12611.15   83.01  0.30( 0.30) 1.00   22530.7   10700.00
     16    12293.81   89.24  0.30( 0.30) 1.00   23310.8   10400.00
     17    12075.44   92.80  0.30( 0.30) 1.00   23684.5   10200.00
     18    11753.74   99.59  0.30( 0.30) 1.00   24304.0   10320.00
     19    11429.36  103.87  0.30( 0.30) 1.00   24466.1   10210.00
     20     9736.81  134.22  0.30( 0.30) 1.00   25186.1   10100.00
   TOTAL AREA(ACRES) =     25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    651.70  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2004.08   CHANNEL SLOPE =  0.0291
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.973
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13650.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.80
  AVERAGE FLOW DEPTH(FEET) =  11.34   TRAVEL TIME(MIN.) =   1.78
  Tc(MIN.) =   52.60
  SUBAREA AREA(ACRES) =    54.88       SUBAREA RUNOFF(CFS) =   33.24
  EFFECTIVE AREA(ACRES) =  15520.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    25241.0          PEAK FLOW RATE(CFS) =   13634.05
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.33   FLOW VELOCITY(FEET/SEC.) =  18.79
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11227.96   31.42    1.266  0.30( 0.30) 1.00    7846.9   11000.00
      2    12818.09   43.45    1.073  0.30( 0.30) 1.00   12107.4   11330.00
      3    13029.55   45.23    1.052  0.30( 0.30) 1.00   12779.7   10850.00
      4    13063.92   46.39    1.038  0.30( 0.30) 1.00   13201.9   10800.00
      5    13353.90   48.51    1.013  0.30( 0.30) 1.00   14102.9   10900.00
      6    13421.25   49.13    1.005  0.30( 0.30) 1.00   14347.9   11300.00
      7    13623.31   51.73    0.980  0.30( 0.30) 1.00   15297.5   10910.00
      8    13634.05   52.60    0.973  0.30( 0.30) 1.00   15520.8   10630.00
      9    13245.41   65.19    0.885  0.30( 0.30) 1.00   18814.2   10600.00
     10    13164.94   70.03    0.862  0.30( 0.30) 1.00   20101.0   11111.00
     11    13150.89   70.80    0.858  0.30( 0.30) 1.00   20291.0   11101.00
     12    13101.15   72.81    0.848  0.30( 0.30) 1.00   20696.4   10500.00
     13    12985.72   76.99    0.828  0.30( 0.30) 1.00   21485.8   10710.00
     14    12873.29   79.52    0.816  0.30( 0.30) 1.00   21872.5   10410.00
     15    12611.15   84.82    0.790  0.30( 0.30) 1.00   22585.6   10700.00
     16    12293.81   91.07    0.762  0.30( 0.30) 1.00   23365.6   10400.00
     17    12075.44   94.63    0.753  0.30( 0.30) 1.00   23739.4   10200.00
     18    11753.74  101.44    0.735  0.30( 0.30) 1.00   24358.8   10320.00
     19    11429.36  105.74    0.724  0.30( 0.30) 1.00   24521.0   10210.00
     20     9736.81  136.16    0.658  0.30( 0.30) 1.00   25241.0   10100.00
```

```
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      206.88   20.67    1.641  0.30( 0.30) 1.00     171.4   11500.00
 LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    10465.51   20.67    1.641  0.30( 0.30) 1.00    5335.1   11500.00
     2    11376.94   31.42    1.266  0.30( 0.30) 1.00    8018.3   11000.00
     3    12937.31   43.45    1.073  0.30( 0.30) 1.00   12278.7   11330.00
     4    13145.51   45.23    1.052  0.30( 0.30) 1.00   12951.1   10850.00
     5    13177.74   46.39    1.038  0.30( 0.30) 1.00   13373.3   10800.00
     6    13463.85   48.51    1.013  0.30( 0.30) 1.00   14274.2   10900.00
     7    13530.05   49.13    1.005  0.30( 0.30) 1.00   14519.3   11300.00
     8    13728.25   51.73    0.980  0.30( 0.30) 1.00   15468.8   10910.00
     9    13737.84   52.60    0.973  0.30( 0.30) 1.00   15692.2   10630.00
    10    13335.64   65.19    0.885  0.30( 0.30) 1.00   18985.6   10600.00
    11    13251.55   70.03    0.862  0.30( 0.30) 1.00   20272.4   11111.00
    12    13236.93   70.80    0.858  0.30( 0.30) 1.00   20462.4   11101.00
    13    13185.70   72.81    0.848  0.30( 0.30) 1.00   20867.8   10500.00
    14    13067.14   76.99    0.828  0.30( 0.30) 1.00   21657.2   10710.00
    15    12952.84   79.52    0.816  0.30( 0.30) 1.00   22043.9   10410.00
    16    12686.74   84.82    0.790  0.30( 0.30) 1.00   22756.9   10700.00
    17    12365.10   91.07    0.762  0.30( 0.30) 1.00   23537.0   10400.00
    18    12145.28   94.63    0.753  0.30( 0.30) 1.00   23910.8   10200.00
    19    11820.82  101.44    0.735  0.30( 0.30) 1.00   24530.2   10320.00
    20    11494.70  105.74    0.724  0.30( 0.30) 1.00   24692.4   10210.00
    21     9791.99  136.16    0.658  0.30( 0.30) 1.00   25412.4   10100.00
   TOTAL AREA(ACRES) =     25412.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    13737.84  Tc(MIN.) =   52.604
 EFFECTIVE AREA(ACRES) =  15692.18  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =    25412.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11520.00 TO NODE  11540.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    593.37  DOWNSTREAM(FEET) =    577.77
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1515.75   CHANNEL SLOPE =  0.0103
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.04
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.956
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      100.60      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13767.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.98
 AVERAGE FLOW DEPTH(FEET) =   8.03   TRAVEL TIME(MIN.) =   1.95
 Tc(MIN.) =   54.55
 SUBAREA AREA(ACRES) =   100.60       SUBAREA RUNOFF(CFS) =   59.43
 EFFECTIVE AREA(ACRES) =  15792.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    25513.0         PEAK FLOW RATE(CFS) =   13737.84
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.02

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.02   FLOW VELOCITY(FEET/SEC.) =  12.96
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11540.00 =   74743.79 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11520.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   54.55
 RAINFALL INTENSITY(INCH/HR) =   0.96
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =   15792.78
 TOTAL STREAM AREA(ACRES) =   25512.96
 PEAK FLOW RATE(CFS) AT CONFLUENCE =   13737.84

****************************************************************************
 FLOW PROCESS FROM NODE  11530.00 TO NODE  11531.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   278.68
 ELEVATION DATA: UPSTREAM(FEET) =   1593.31  DOWNSTREAM(FEET) =   1523.14

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.844
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.059
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "OPEN BRUSH"               -        1.18      0.30     1.000     0    8.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      2.93
 TOTAL AREA(ACRES) =      1.18   PEAK FLOW RATE(CFS) =      2.93

****************************************************************************
 FLOW PROCESS FROM NODE  11531.00 TO NODE  11532.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1523.14  DOWNSTREAM(FEET) =   1297.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =   698.37   CHANNEL SLOPE =  0.3230
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.545
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.32      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.00
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   2.33
  Tc(MIN.) =   11.17
  SUBAREA AREA(ACRES) =     8.32       SUBAREA RUNOFF(CFS) =   16.81
  EFFECTIVE AREA(ACRES) =      9.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.5         PEAK FLOW RATE(CFS) =      19.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.30   FLOW VELOCITY(FEET/SEC.) =   6.03
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11532.00 =     977.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11532.00 TO NODE  11533.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1297.56  DOWNSTREAM(FEET) =   1134.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.17   CHANNEL SLOPE =  0.1693
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.135
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =   13.80
  SUBAREA AREA(ACRES) =    18.50       SUBAREA RUNOFF(CFS) =   30.56
  EFFECTIVE AREA(ACRES) =     28.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.0         PEAK FLOW RATE(CFS) =      46.25
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   6.72
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11533.00 =    1939.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11533.00 TO NODE  11534.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1134.68  DOWNSTREAM(FEET) =   1002.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.78   CHANNEL SLOPE =  0.1379
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.912
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     117.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.62
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   1.85
  Tc(MIN.) =   15.65
  SUBAREA AREA(ACRES) =    98.44       SUBAREA RUNOFF(CFS) =  142.82
  EFFECTIVE AREA(ACRES) =    126.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      126.4         PEAK FLOW RATE(CFS) =     183.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOW VELOCITY(FEET/SEC.) =   9.96
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11534.00 =    2896.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11534.00 TO NODE  11535.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1002.72  DOWNSTREAM(FEET) =    816.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2160.78   CHANNEL SLOPE =  0.0863
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.702
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.87      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     268.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.49
  AVERAGE FLOW DEPTH(FEET) =   2.02   TRAVEL TIME(MIN.) =   3.79
  Tc(MIN.) =   19.44
  SUBAREA AREA(ACRES) =   134.87       SUBAREA RUNOFF(CFS) =  170.16
  EFFECTIVE AREA(ACRES) =    261.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      261.3         PEAK FLOW RATE(CFS) =     329.69
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.26   FLOW VELOCITY(FEET/SEC.) =  10.07
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11535.00 =    5056.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    816.20  DOWNSTREAM(FEET) =    577.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3109.20   CHANNEL SLOPE =  0.0767
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.51
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.467
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     370.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.98
  AVERAGE FLOW DEPTH(FEET) =   2.48   TRAVEL TIME(MIN.) =   5.19
  Tc(MIN.) =   24.64
  SUBAREA AREA(ACRES) =    78.24       SUBAREA RUNOFF(CFS) =   82.18
  EFFECTIVE AREA(ACRES) =    339.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      339.5         PEAK FLOW RATE(CFS) =     356.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.43   FLOW VELOCITY(FEET/SEC.) =   9.88
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11540.00 =    8165.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```



```
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   24.64
RAINFALL INTENSITY(INCH/HR) =   1.47
AREA-AVERAGED Fm(INCH/HR) =  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30
AREA-AVERAGED Ap =  1.00
EFFECTIVE STREAM AREA(ACRES) =     339.55
TOTAL STREAM AREA(ACRES) =     339.55
PEAK FLOW RATE(CFS) AT CONFLUENCE =     356.67

** CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1    10465.51   22.79    1.548  0.30( 0.30) 1.00    5435.7   11500.00
    1    11376.94   33.48    1.229  0.30( 0.30) 1.00    8118.9   11000.00
    1    12937.31   45.44    1.049  0.30( 0.30) 1.00   12379.3   11330.00
    1    13145.51   47.20    1.028  0.30( 0.30) 1.00   13051.7   10850.00
    1    13177.74   48.37    1.014  0.30( 0.30) 1.00   13473.9   10800.00
    1    13463.85   50.47    0.991  0.30( 0.30) 1.00   14374.8   10900.00
    1    13530.05   51.08    0.986  0.30( 0.30) 1.00   14619.9   11300.00
    1    13728.25   53.68    0.964  0.30( 0.30) 1.00   15569.4   10910.00
    1    13737.84   54.55    0.956  0.30( 0.30) 1.00   15792.8   10630.00
    1    13335.64   67.15    0.875  0.30( 0.30) 1.00   19086.2   10600.00
    1    13251.55   72.00    0.852  0.30( 0.30) 1.00   20373.0   11111.00
    1    13236.93   72.77    0.848  0.30( 0.30) 1.00   20563.0   11101.00
    1    13185.70   74.79    0.839  0.30( 0.30) 1.00   20968.4   10500.00
    1    13067.14   78.97    0.818  0.30( 0.30) 1.00   21757.8   10710.00
    1    12952.84   81.50    0.806  0.30( 0.30) 1.00   22144.5   10410.00
    1    12686.74   86.82    0.780  0.30( 0.30) 1.00   22857.5   10700.00
    1    12365.10   93.08    0.757  0.30( 0.30) 1.00   23637.6   10400.00
    1    12145.28   96.66    0.747  0.30( 0.30) 1.00   24011.4   10200.00
    1    11820.82  103.48    0.730  0.30( 0.30) 1.00   24630.8   10320.00
    1    11494.70  107.80    0.718  0.30( 0.30) 1.00   24793.0   10210.00
    1     9791.99  138.33    0.654  0.30( 0.30) 1.00   25513.0   10100.00
    2      356.67   24.64    1.467  0.30( 0.30) 1.00     339.5   11530.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1    10818.43   22.79    1.548  0.30( 0.30) 1.00    5749.8   11500.00
    2    10979.15   24.64    1.467  0.30( 0.30) 1.00    6237.3   11530.00
    3    11660.96   33.48    1.229  0.30( 0.30) 1.00    8458.5   11000.00
    4    13166.31   45.44    1.049  0.30( 0.30) 1.00   12718.9   11330.00
    5    13368.10   47.20    1.028  0.30( 0.30) 1.00   13391.3   10850.00
    6    13396.08   48.37    1.014  0.30( 0.30) 1.00   13813.4   10800.00
    7    13675.04   50.47    0.991  0.30( 0.30) 1.00   14714.4   10900.00
    8    13739.64   51.08    0.986  0.30( 0.30) 1.00   14959.5   11300.00
    9    13931.10   53.68    0.964  0.30( 0.30) 1.00   15909.0   10910.00
   10    13938.42   54.55    0.956  0.30( 0.30) 1.00   16132.3   10630.00
   11    13511.51   67.15    0.875  0.30( 0.30) 1.00   19425.8   10600.00
   12    13420.26   72.00    0.852  0.30( 0.30) 1.00   20712.5   11111.00
   13    13404.50   72.77    0.848  0.30( 0.30) 1.00   20902.5   11101.00
   14    13350.29   74.79    0.839  0.30( 0.30) 1.00   21307.9   10500.00
   15    13225.56   78.97    0.818  0.30( 0.30) 1.00   22097.3   10710.00
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    16    13107.51   81.50    0.806  0.30( 0.30) 1.00   22484.0   10410.00
    17    12833.56   86.82    0.780  0.30( 0.30) 1.00   23197.1   10700.00
    18    12504.75   93.08    0.757  0.30( 0.30) 1.00   23977.2   10400.00
    19    12282.05   96.66    0.747  0.30( 0.30) 1.00   24350.9   10200.00
    20    11952.10  103.48    0.730  0.30( 0.30) 1.00   24970.4   10320.00
    21    11622.50  107.80    0.718  0.30( 0.30) 1.00   25132.5   10210.00
    22     9900.17  138.33    0.654  0.30( 0.30) 1.00   25852.5   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   13938.42    Tc(MIN.) =    54.55
  EFFECTIVE AREA(ACRES) =   16132.33   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    25852.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11540.00 =   74743.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11540.00 TO NODE  11541.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    577.77  DOWNSTREAM(FEET) =    556.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.36   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.934
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      389.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14049.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.11
  AVERAGE FLOW DEPTH(FEET) =   8.10   TRAVEL TIME(MIN.) =   2.61
  Tc(MIN.) =   57.16
  SUBAREA AREA(ACRES) =   389.46       SUBAREA RUNOFF(CFS) =  222.29
  EFFECTIVE AREA(ACRES) =  16521.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26242.0         PEAK FLOW RATE(CFS) =   13938.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.06   FLOW VELOCITY(FEET/SEC.) =  13.07
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11541.00 =   76797.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11541.00 TO NODE  11542.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.39  DOWNSTREAM(FEET) =    523.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3267.94   CHANNEL SLOPE =  0.0101
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  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.17
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.903
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      330.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14028.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.97
  AVERAGE FLOW DEPTH(FEET) =   8.15   TRAVEL TIME(MIN.) =   4.20
  Tc(MIN.) =   61.36
  SUBAREA AREA(ACRES) =   330.30       SUBAREA RUNOFF(CFS) =  179.40
  EFFECTIVE AREA(ACRES) =  16852.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26572.3         PEAK FLOW RATE(CFS) =   13938.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.12   FLOW VELOCITY(FEET/SEC.) =  12.95
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11542.00 =   80065.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11542.00 TO NODE  11543.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    523.29  DOWNSTREAM(FEET) =    493.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2857.94   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.886
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      285.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14013.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.08
  AVERAGE FLOW DEPTH(FEET) =   8.09   TRAVEL TIME(MIN.) =   3.64
  Tc(MIN.) =   65.00
  SUBAREA AREA(ACRES) =   285.11       SUBAREA RUNOFF(CFS) =  150.34
  EFFECTIVE AREA(ACRES) =  17137.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26857.4         PEAK FLOW RATE(CFS) =   13938.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.07
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.07   FLOW VELOCITY(FEET/SEC.) =  13.06
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11543.00 =   82923.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11543.00 TO NODE  11544.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    493.61  DOWNSTREAM(FEET) =    480.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.01   CHANNEL SLOPE =  0.0068
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.10
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.872
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      303.63      0.30     0.987     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.987
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14017.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.32
  AVERAGE FLOW DEPTH(FEET) =   9.08   TRAVEL TIME(MIN.) =   2.89
  Tc(MIN.) =   67.89
  SUBAREA AREA(ACRES) =   303.63       SUBAREA RUNOFF(CFS) =  157.35
  EFFECTIVE AREA(ACRES) =  17440.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27161.0         PEAK FLOW RATE(CFS) =   13938.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.05   FLOW VELOCITY(FEET/SEC.) =  11.30
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11544.00 =   84886.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11544.00 TO NODE  11545.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    480.21  DOWNSTREAM(FEET) =    456.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1914.49   CHANNEL SLOPE =  0.0122
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.74
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.861
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      184.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13984.90
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.81
  AVERAGE FLOW DEPTH(FEET) =   7.73   TRAVEL TIME(MIN.) =   2.31
  Tc(MIN.) =   70.20
  SUBAREA AREA(ACRES) =   184.16       SUBAREA RUNOFF(CFS) =   92.94
  EFFECTIVE AREA(ACRES) =  17624.99     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27345.2         PEAK FLOW RATE(CFS) =   13938.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.72   FLOW VELOCITY(FEET/SEC.) =  13.80
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11545.00 =   86800.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    456.90  DOWNSTREAM(FEET) =    436.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2322.79   CHANNEL SLOPE =  0.0089
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.44
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.846
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.95      0.30     0.844     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.844
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13978.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.39
  AVERAGE FLOW DEPTH(FEET) =   8.43   TRAVEL TIME(MIN.) =   3.12
  Tc(MIN.) =   73.32
  SUBAREA AREA(ACRES) =   151.95       SUBAREA RUNOFF(CFS) =   81.02
  EFFECTIVE AREA(ACRES) =  17776.94     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27497.1         PEAK FLOW RATE(CFS) =   13938.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.42   FLOW VELOCITY(FEET/SEC.) =  12.39
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    27497.1  TC(MIN.) =     73.32
  EFFECTIVE AREA(ACRES) =  17776.94  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.997
  PEAK FLOW RATE(CFS)   =   13938.42

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10818.43	43.08	1.077	0.30(0.30)	1.00	7394.5	11500.00
2	10979.15	44.84	1.056	0.30(0.30)	1.00	7881.9	11530.00
3	11660.96	53.31	0.967	0.30(0.30)	1.00	10103.1	11000.00
4	13166.31	64.54	0.888	0.30(0.30)	1.00	14363.5	11330.00
5	13368.10	66.21	0.880	0.30(0.30)	1.00	15035.9	10850.00
6	13396.08	67.37	0.874	0.30(0.30)	1.00	15458.1	10800.00
7	13675.04	69.35	0.865	0.30(0.30)	1.00	16359.0	10900.00
8	13739.64	69.94	0.862	0.30(0.30)	1.00	16604.1	11300.00
9	13931.10	72.46	0.850	0.30(0.30)	1.00	17553.6	10910.00
10	13938.42	73.32	0.846	0.30(0.30)	1.00	17776.9	10630.00
11	13511.51	86.11	0.784	0.30(0.30)	1.00	21070.4	10600.00
12	13420.26	91.00	0.762	0.30(0.30)	1.00	22357.2	11111.00
13	13404.50	91.78	0.760	0.30(0.30)	1.00	22547.1	11101.00
14	13350.29	93.81	0.755	0.30(0.30)	1.00	22952.6	10500.00
15	13225.56	98.06	0.744	0.30(0.30)	1.00	23741.9	10710.00
16	13107.51	100.64	0.737	0.30(0.30)	1.00	24128.6	10410.00
17	12833.56	106.09	0.723	0.30(0.30)	1.00	24841.7	10700.00
18	12504.75	112.50	0.706	0.30(0.30)	1.00	25621.8	10400.00
19	12282.05	116.19	0.696	0.30(0.30)	1.00	25995.5	10200.00
20	11952.10	123.18	0.680	0.30(0.30)	1.00	26615.0	10320.00
21	11622.50	127.67	0.673	0.30(0.30)	1.00	26777.2	10210.00
22	9900.17	159.24	0.617	0.30(0.30)	1.00	27497.1	10100.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S16.DAT
  TIME/DATE OF STUDY: 10:23 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.159
   2)   10.00;  2.728
   3)   15.00;  1.948
   4)   20.00;  1.671
   5)   25.00;  1.451
   6)   30.00;  1.291
   7)   40.00;  1.114
   8)   50.00;  0.995
   9)   60.00;  0.910
  10)   90.00;  0.765
  11)  120.00;  0.686
  12)  180.00;  0.581
  13)  360.00;  0.439
  14) 1440.00;  0.195
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11600.00 TO NODE  11601.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.21
  ELEVATION DATA: UPSTREAM(FEET) =   3061.08  DOWNSTREAM(FEET) =   2962.88

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.120
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.709
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.79      0.30     1.000     0   10.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.88
  TOTAL AREA(ACRES) =      1.79   PEAK FLOW RATE(CFS) =      3.88

************************************************************************
  FLOW PROCESS FROM NODE  11601.00 TO NODE  11602.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.88  DOWNSTREAM(FEET) =   2839.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =   548.33   CHANNEL SLOPE =  0.2252
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.351
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.97
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   2.30
  Tc(MIN.) =   12.42
  SUBAREA AREA(ACRES) =     4.88       SUBAREA RUNOFF(CFS) =    9.01
  EFFECTIVE AREA(ACRES) =      6.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =      12.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   4.56
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11602.00 =     938.54 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11602.00 TO NODE  11603.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2839.39  DOWNSTREAM(FEET) =   2697.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.87   CHANNEL SLOPE =  0.1452
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.60
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.937
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.87
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   2.77
  Tc(MIN.) =   15.19
  SUBAREA AREA(ACRES) =    31.42       SUBAREA RUNOFF(CFS) =   46.30
  EFFECTIVE AREA(ACRES) =     38.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.1         PEAK FLOW RATE(CFS) =      56.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   6.88
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11603.00 =    1915.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11603.00 TO NODE  11604.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2697.55  DOWNSTREAM(FEET) =   2598.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1887.15   CHANNEL SLOPE =  0.0523
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.41
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.648
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.03      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     100.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.90
  AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   5.33
  Tc(MIN.) =   20.53
  SUBAREA AREA(ACRES) =    72.03       SUBAREA RUNOFF(CFS) =   87.38
  EFFECTIVE AREA(ACRES) =    110.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =     133.59
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.57   FLOW VELOCITY(FEET/SEC.) =   6.45
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11604.00 =    3802.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11604.00 TO NODE  11605.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2598.90  DOWNSTREAM(FEET) =   2464.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2488.89   CHANNEL SLOPE =  0.0541
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.91
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.409
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     181.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.17
  AVERAGE FLOW DEPTH(FEET) =   1.85   TRAVEL TIME(MIN.) =   5.79
  Tc(MIN.) =   26.32
  SUBAREA AREA(ACRES) =    96.28       SUBAREA RUNOFF(CFS) =   96.09
  EFFECTIVE AREA(ACRES) =    206.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.4         PEAK FLOW RATE(CFS) =     206.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.98   FLOW VELOCITY(FEET/SEC.) =   7.45
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11605.00 =    6291.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11605.00 TO NODE  11606.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.25  DOWNSTREAM(FEET) =   2359.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1936.71   CHANNEL SLOPE =  0.0538
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.60
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.289
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      266.26      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     324.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.48
  AVERAGE FLOW DEPTH(FEET) =   2.54   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   30.12
  SUBAREA AREA(ACRES) =   266.26       SUBAREA RUNOFF(CFS) =  236.98
  EFFECTIVE AREA(ACRES) =    472.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      472.7          PEAK FLOW RATE(CFS) =     420.69
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.91   FLOW VELOCITY(FEET/SEC.) =   9.13
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11606.00 =    8228.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11606.00 TO NODE  11607.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2359.99  DOWNSTREAM(FEET) =   1905.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3829.49   CHANNEL SLOPE =  0.1188
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.53
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.199
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     474.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.55
  AVERAGE FLOW DEPTH(FEET) =   2.51   TRAVEL TIME(MIN.) =   5.09
  Tc(MIN.) =   35.21
  SUBAREA AREA(ACRES) =   132.44       SUBAREA RUNOFF(CFS) =  107.15
  EFFECTIVE AREA(ACRES) =    605.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      605.1          PEAK FLOW RATE(CFS) =     489.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.56   FLOW VELOCITY(FEET/SEC.) =  12.66
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11607.00 =   12057.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11607.00 TO NODE  11608.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   1905.15  DOWNSTREAM(FEET) =   1717.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1095.02   CHANNEL SLOPE =  0.1710
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.177
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       76.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     519.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.65
  AVERAGE FLOW DEPTH(FEET) =   2.40   TRAVEL TIME(MIN.) =   1.25
  Tc(MIN.) =   36.45
  SUBAREA AREA(ACRES) =    76.91       SUBAREA RUNOFF(CFS) =   60.70
  EFFECTIVE AREA(ACRES) =    682.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      682.0          PEAK FLOW RATE(CFS) =     538.22
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.44   FLOW VELOCITY(FEET/SEC.) =  14.79
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11608.00 =   13152.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11608.00 TO NODE  11609.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1717.92  DOWNSTREAM(FEET) =   1516.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1480.24   CHANNEL SLOPE =  0.1362
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.91
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.147
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     663.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.47
  AVERAGE FLOW DEPTH(FEET) =   2.90   TRAVEL TIME(MIN.) =   1.71
  Tc(MIN.) =   38.16
  SUBAREA AREA(ACRES) =   328.91       SUBAREA RUNOFF(CFS) =  250.63
  EFFECTIVE AREA(ACRES) =   1010.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1010.9          PEAK FLOW RATE(CFS) =     770.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.13
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.13   FLOW VELOCITY(FEET/SEC.) =  15.12
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11609.00 =   14632.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11609.00 TO NODE  11610.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1516.24  DOWNSTREAM(FEET) =   1332.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.38   CHANNEL SLOPE =  0.0957
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.73
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.108
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      355.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     899.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.86
  AVERAGE FLOW DEPTH(FEET) =   3.72   TRAVEL TIME(MIN.) =   2.31
  Tc(MIN.) =   40.47
  SUBAREA AREA(ACRES) =   355.16       SUBAREA RUNOFF(CFS) =  258.41
  EFFECTIVE AREA(ACRES) =   1366.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1366.1          PEAK FLOW RATE(CFS) =     993.96
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.91   FLOW VELOCITY(FEET/SEC.) =  14.26
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11610.00 =   16558.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11610.00 TO NODE  11611.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1332.01  DOWNSTREAM(FEET) =   1105.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2901.03   CHANNEL SLOPE =  0.0781
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.066
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      234.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1074.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.52
```



```
  AVERAGE FLOW DEPTH(FEET) =   4.28   TRAVEL TIME(MIN.) =   3.58
  Tc(MIN.) =   44.05
  SUBAREA AREA(ACRES) =   234.59       SUBAREA RUNOFF(CFS) =  161.70
  EFFECTIVE AREA(ACRES) =   1600.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1600.7          PEAK FLOW RATE(CFS) =    1103.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.34   FLOW VELOCITY(FEET/SEC.) =  13.62
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11611.00 =   19459.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11611.00 TO NODE  11612.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.34  DOWNSTREAM(FEET) =   1030.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1982.46   CHANNEL SLOPE =  0.0378
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.36
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.029
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1173.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.59
  AVERAGE FLOW DEPTH(FEET) =   5.35   TRAVEL TIME(MIN.) =   3.12
  Tc(MIN.) =   47.17
  SUBAREA AREA(ACRES) =   212.67       SUBAREA RUNOFF(CFS) =  139.48
  EFFECTIVE AREA(ACRES) =   1813.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1813.3          PEAK FLOW RATE(CFS) =    1189.32
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.38   FLOW VELOCITY(FEET/SEC.) =  10.64
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11612.00 =   21441.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.47  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3051.86   CHANNEL SLOPE =  0.0525
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.27
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.984
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      465.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1332.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.37
  AVERAGE FLOW DEPTH(FEET) =   5.25   TRAVEL TIME(MIN.) =   4.11
  Tc(MIN.) =   51.28
  SUBAREA AREA(ACRES) =   465.36       SUBAREA RUNOFF(CFS) =  286.55
  EFFECTIVE AREA(ACRES) =   2278.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2278.7         PEAK FLOW RATE(CFS) =    1403.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.39   FLOW VELOCITY(FEET/SEC.) =  12.53
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   51.28
  RAINFALL INTENSITY(INCH/HR) =   0.98
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2278.70
  TOTAL STREAM AREA(ACRES) =    2278.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1403.11

****************************************************************************
  FLOW PROCESS FROM NODE  11620.00 TO NODE  11621.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   266.64
  ELEVATION DATA: UPSTREAM(FEET) =   2567.03  DOWNSTREAM(FEET) =   2486.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.387
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.190
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        0.69      0.30     1.000     0    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.79
  TOTAL AREA(ACRES) =      0.69   PEAK FLOW RATE(CFS) =      1.79

****************************************************************************
  FLOW PROCESS FROM NODE  11621.00 TO NODE  11622.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2486.90  DOWNSTREAM(FEET) =   2424.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   712.48   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.23
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.210
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.41
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   4.94
  Tc(MIN.) =   13.32
  SUBAREA AREA(ACRES) =     3.63       SUBAREA RUNOFF(CFS) =    6.24
  EFFECTIVE AREA(ACRES) =      4.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.3         PEAK FLOW RATE(CFS) =       7.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   2.77
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11622.00 =     979.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11622.00 TO NODE  11623.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2424.91  DOWNSTREAM(FEET) =   2351.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.46   CHANNEL SLOPE =  0.0751
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.790
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.60
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   4.53
  Tc(MIN.) =   17.85
  SUBAREA AREA(ACRES) =    13.42       SUBAREA RUNOFF(CFS) =   18.00
  EFFECTIVE AREA(ACRES) =     17.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.7         PEAK FLOW RATE(CFS) =      23.79
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   4.11
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11623.00 =    1956.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11623.00 TO NODE  11624.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2351.48  DOWNSTREAM(FEET) =   2317.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.96   CHANNEL SLOPE =  0.0355
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.81
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.573
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.60
  AVERAGE FLOW DEPTH(FEET) =   0.79   TRAVEL TIME(MIN.) =   4.39
  Tc(MIN.) =   22.23
  SUBAREA AREA(ACRES) =    16.02       SUBAREA RUNOFF(CFS) =   18.35
  EFFECTIVE AREA(ACRES) =     33.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.8         PEAK FLOW RATE(CFS) =      38.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   3.80
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.00 =    2904.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.00 TO NODE  11624.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2317.87  DOWNSTREAM(FEET) =   2292.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   758.23   CHANNEL SLOPE =  0.0337
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



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  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.443
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.93      0.30     0.984     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.20
  AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   3.01
  Tc(MIN.) =   25.24
  SUBAREA AREA(ACRES) =    32.93       SUBAREA RUNOFF(CFS) =   34.03
  EFFECTIVE AREA(ACRES) =     66.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =      68.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   4.51
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.50 =    3662.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.50 TO NODE  11625.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2292.33  DOWNSTREAM(FEET) =   2256.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1098.98   CHANNEL SLOPE =  0.0325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.323
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       48.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      90.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.85
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   3.77
  Tc(MIN.) =   29.01
  SUBAREA AREA(ACRES) =    48.16       SUBAREA RUNOFF(CFS) =   44.32
  EFFECTIVE AREA(ACRES) =    114.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.9         PEAK FLOW RATE(CFS) =     105.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.58   FLOW VELOCITY(FEET/SEC.) =   5.10
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11625.00 =    4761.75 FEET.
```

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****************************************************************************
  FLOW PROCESS FROM NODE  11625.00 TO NODE  11626.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2256.59  DOWNSTREAM(FEET) =   2104.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.93   CHANNEL SLOPE =  0.0739
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.234
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.15      0.30     0.950     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.950
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     196.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.18
  AVERAGE FLOW DEPTH(FEET) =   1.77   TRAVEL TIME(MIN.) =   4.19
  Tc(MIN.) =   33.20
  SUBAREA AREA(ACRES) =   212.15       SUBAREA RUNOFF(CFS) =  181.27
  EFFECTIVE AREA(ACRES) =    327.00     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      327.0         PEAK FLOW RATE(CFS) =     277.99
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.15   FLOW VELOCITY(FEET/SEC.) =   9.06
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11626.00 =    6818.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11626.00 TO NODE  11627.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2104.66  DOWNSTREAM(FEET) =   1837.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2716.08   CHANNEL SLOPE =  0.0985
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.159
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     335.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.61
  AVERAGE FLOW DEPTH(FEET) =   2.19   TRAVEL TIME(MIN.) =   4.27
  Tc(MIN.) =   37.47
  SUBAREA AREA(ACRES) =   147.74       SUBAREA RUNOFF(CFS) =  114.20
  EFFECTIVE AREA(ACRES) =    474.74     AREA-AVERAGED Fm(INCH/HR) =   0.29
```



```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      474.7         PEAK FLOW RATE(CFS) =     369.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.32   FLOW VELOCITY(FEET/SEC.) =  10.91
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11627.00 =    9534.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11627.00 TO NODE  11628.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1837.03  DOWNSTREAM(FEET) =   1393.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2077.86   CHANNEL SLOPE =  0.2132
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.118
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      202.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     444.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.17
  AVERAGE FLOW DEPTH(FEET) =   2.07   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =   39.75
  SUBAREA AREA(ACRES) =   202.44       SUBAREA RUNOFF(CFS) =  149.12
  EFFECTIVE AREA(ACRES) =    677.18     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      677.2         PEAK FLOW RATE(CFS) =     501.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.22   FLOW VELOCITY(FEET/SEC.) =  15.68
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11628.00 =   11612.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11628.00 TO NODE  11629.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1393.93  DOWNSTREAM(FEET) =   1201.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2844.34   CHANNEL SLOPE =  0.0676
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.17
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.064
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      141.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     550.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.69
  AVERAGE FLOW DEPTH(FEET) =   3.16   TRAVEL TIME(MIN.) =   4.43
  Tc(MIN.) =   44.18
  SUBAREA AREA(ACRES) =   141.55       SUBAREA RUNOFF(CFS) =   97.36
  EFFECTIVE AREA(ACRES) =    818.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      818.7         PEAK FLOW RATE(CFS) =     566.17
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.21   FLOW VELOCITY(FEET/SEC.) =  10.75
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11629.00 =   14456.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1201.61  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3807.89   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.10
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.001
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      106.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     599.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.98
  AVERAGE FLOW DEPTH(FEET) =   3.09   TRAVEL TIME(MIN.) =   5.30
  Tc(MIN.) =   49.48
  SUBAREA AREA(ACRES) =   106.41       SUBAREA RUNOFF(CFS) =   67.16
  EFFECTIVE AREA(ACRES) =    925.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      925.1         PEAK FLOW RATE(CFS) =     586.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.06   FLOW VELOCITY(FEET/SEC.) =  11.92
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11630.00 =   18264.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   49.48
  RAINFALL INTENSITY(INCH/HR) =   1.00
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     925.14
  TOTAL STREAM AREA(ACRES) =     925.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     586.87

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1403.11   51.28    0.984  0.30( 0.30) 1.00    2278.7   11600.00
      2      586.87   49.48    1.001  0.30( 0.30) 0.99     925.1   11620.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1974.50   49.48    1.001  0.30( 0.30) 1.00    3123.8   11620.00
      2     1975.78   51.28    0.984  0.30( 0.30) 1.00    3203.8   11600.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1975.78    Tc(MIN.) =    51.28
  EFFECTIVE AREA(ACRES) =    3203.84   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3203.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3203.8  TC(MIN.) =     51.28
  EFFECTIVE AREA(ACRES) =   3203.84  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.997
  PEAK FLOW RATE(CFS)   =    1975.78

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1974.50   49.48    1.001  0.30( 0.30) 1.00    3123.8   11620.00
      2     1975.78   51.28    0.984  0.30( 0.30) 1.00    3203.8   11600.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S17.DAT
  TIME/DATE OF STUDY: 10:23 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.159
   2)   10.00;  2.728
   3)   15.00;  1.948
   4)   20.00;  1.671
   5)   25.00;  1.451
   6)   30.00;  1.291
   7)   40.00;  1.114
   8)   50.00;  0.995
   9)   60.00;  0.910
  10)   90.00;  0.765
  11)  120.00;  0.686
  12)  180.00;  0.581
  13)  360.00;  0.439
  14) 1440.00;  0.195
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11701.00 TO NODE  11702.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   291.79
  ELEVATION DATA: UPSTREAM(FEET) =   1581.05  DOWNSTREAM(FEET) =   1496.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.753
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.085
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.72      0.30     1.000     0    8.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.82
  TOTAL AREA(ACRES) =      2.72   PEAK FLOW RATE(CFS) =      6.82

**************************************************************************
  FLOW PROCESS FROM NODE  11702.00 TO NODE  11703.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1496.25  DOWNSTREAM(FEET) =   1254.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   563.54   CHANNEL SLOPE =  0.4293
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.693
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.39
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.47
  Tc(MIN.) =   10.22
  SUBAREA AREA(ACRES) =    10.12       SUBAREA RUNOFF(CFS) =   21.80
  EFFECTIVE AREA(ACRES) =     12.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.8          PEAK FLOW RATE(CFS) =      27.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   7.60
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11703.00 =     855.33 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11703.00 TO NODE  11704.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1254.33  DOWNSTREAM(FEET) =   1143.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.91   CHANNEL SLOPE =  0.1076
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.236
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.84
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.93
  Tc(MIN.) =   13.15
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   37.50
  EFFECTIVE AREA(ACRES) =     34.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.4         PEAK FLOW RATE(CFS) =      59.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   6.35
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11704.00 =    1881.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11704.00 TO NODE  11705.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1143.91  DOWNSTREAM(FEET) =    804.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1952.20   CHANNEL SLOPE =  0.1737
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.843
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      94.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.70
  AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   16.89
  SUBAREA AREA(ACRES) =    50.19       SUBAREA RUNOFF(CFS) =   69.72
  EFFECTIVE AREA(ACRES) =     84.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       84.6         PEAK FLOW RATE(CFS) =     117.44
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =   9.32
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11705.00 =    3833.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    804.90  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1056.71   CHANNEL SLOPE =  0.0753
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.708
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     127.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.21
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =   19.33
  SUBAREA AREA(ACRES) =    15.89       SUBAREA RUNOFF(CFS) =   20.14
  EFFECTIVE AREA(ACRES) =    100.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.4         PEAK FLOW RATE(CFS) =     127.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   7.20
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S16.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1974.50   49.48  0.30( 0.30) 1.00    3123.8   11620.00
```

```
      2     1975.78   51.28  0.30( 0.30) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =     3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1974.50   49.48  0.30( 0.30) 1.00    3123.8   11620.00
      2     1975.78   51.28  0.30( 0.30) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =      3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.22  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3507.54   CHANNEL SLOPE =  0.0413
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.945
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      213.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2037.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.65
  AVERAGE FLOW DEPTH(FEET) =   6.82   TRAVEL TIME(MIN.) =   4.62
  Tc(MIN.) =   55.91
  SUBAREA AREA(ACRES) =   213.50       SUBAREA RUNOFF(CFS) =  123.91
  EFFECTIVE AREA(ACRES) =   3417.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3417.3         PEAK FLOW RATE(CFS) =    1986.39
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.74   FLOW VELOCITY(FEET/SEC.) =  12.55
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1985.93   54.10    0.960  0.30( 0.30) 1.00    3337.3   11620.00
      2     1986.39   55.91    0.945  0.30( 0.30) 1.00    3417.3   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      127.27   19.33    1.708  0.30( 0.30) 1.00     100.4   11701.00
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1639.56   19.33    1.708  0.30( 0.30) 1.00    1293.0   11701.00
      2     2045.61   54.10    0.960  0.30( 0.30) 1.00    3437.8   11620.00
      3     2044.68   55.91    0.945  0.30( 0.30) 1.00    3517.8   11600.00
    TOTAL AREA(ACRES) =      3517.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2045.61  Tc(MIN.) =   54.104
  EFFECTIVE AREA(ACRES) =   3437.77  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3517.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11721.00 TO NODE  11722.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    725.34  DOWNSTREAM(FEET) =    657.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1845.27   CHANNEL SLOPE =  0.0367
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.927
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      185.10      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2097.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.00
  AVERAGE FLOW DEPTH(FEET) =   2.39   TRAVEL TIME(MIN.) =   3.84
  Tc(MIN.) =   57.95
  SUBAREA AREA(ACRES) =   185.10       SUBAREA RUNOFF(CFS) =  104.54
  EFFECTIVE AREA(ACRES) =   3622.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3702.9         PEAK FLOW RATE(CFS) =    2049.07
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.36   FLOW VELOCITY(FEET/SEC.) =   7.93
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  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11722.00 =   29846.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11722.00 TO NODE  11723.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.70  DOWNSTREAM(FEET) =    609.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1967.44   CHANNEL SLOPE =  0.0245
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.72
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.897
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      273.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2122.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.06
  AVERAGE FLOW DEPTH(FEET) =   2.71   TRAVEL TIME(MIN.) =   4.65
  Tc(MIN.) =   62.59
  SUBAREA AREA(ACRES) =   273.16       SUBAREA RUNOFF(CFS) =  146.90
  EFFECTIVE AREA(ACRES) =   3896.03     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3976.0         PEAK FLOW RATE(CFS) =    2098.20
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.70   FLOW VELOCITY(FEET/SEC.) =   7.02
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11723.00 =   31813.89 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1643.05   28.42    1.342  0.30( 0.30) 1.00    1751.3   11701.00
      2     2098.20   62.59    0.897  0.30( 0.30) 1.00    3896.0   11620.00
      3     2109.86   64.41    0.889  0.30( 0.30) 1.00    3976.0   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2109.86  Tc(MIN.) =   64.41
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3976.04

****************************************************************************
  FLOW PROCESS FROM NODE  11723.00 TO NODE  11724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    609.57  DOWNSTREAM(FEET) =    546.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2808.53   CHANNEL SLOPE =  0.0224
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.81
```



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  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.856
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      159.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2149.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.89
  AVERAGE FLOW DEPTH(FEET) =   2.80   TRAVEL TIME(MIN.) =   6.79
  Tc(MIN.) =   71.20
  SUBAREA AREA(ACRES) =   159.72       SUBAREA RUNOFF(CFS) =   79.91
  EFFECTIVE AREA(ACRES) =   4135.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4135.8         PEAK FLOW RATE(CFS) =    2109.86
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.77   FLOW VELOCITY(FEET/SEC.) =   6.85
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11724.00 =   34622.42 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1643.05   35.80    1.188  0.30( 0.30) 1.00    1911.0   11701.00
      2     2098.20   69.40    0.865  0.30( 0.30) 1.00    4055.7   11620.00
      3     2109.86   71.20    0.856  0.30( 0.30) 1.00    4135.8   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2109.86  Tc(MIN.) =   71.20
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    4135.76

****************************************************************************
  FLOW PROCESS FROM NODE  11724.00 TO NODE  11725.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    546.77  DOWNSTREAM(FEET) =    483.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2921.33   CHANNEL SLOPE =  0.0216
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.821
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.67      0.30     0.917     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2142.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.79
  AVERAGE FLOW DEPTH(FEET) =   2.83   TRAVEL TIME(MIN.) =   7.17
  Tc(MIN.) =   78.37
  SUBAREA AREA(ACRES) =   134.67       SUBAREA RUNOFF(CFS) =   66.20
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  EFFECTIVE AREA(ACRES) =   4270.43     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4270.4         PEAK FLOW RATE(CFS) =    2109.86
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.80   FLOW VELOCITY(FEET/SEC.) =   6.76
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11725.00 =   37543.75 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1643.05   43.60    1.071  0.30( 0.30) 0.99    2045.7   11701.00
      2     2098.20   76.57    0.830  0.30( 0.30) 0.99    4190.4   11620.00
      3     2109.86   78.37    0.821  0.30( 0.30) 0.99    4270.4   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2109.86  Tc(MIN.) =   78.37
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4270.43

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    483.75  DOWNSTREAM(FEET) =    436.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2685.66   CHANNEL SLOPE =  0.0177
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.787
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      121.44      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2136.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.37
  AVERAGE FLOW DEPTH(FEET) =   2.99   TRAVEL TIME(MIN.) =   7.02
  Tc(MIN.) =   85.39
  SUBAREA AREA(ACRES) =   121.44       SUBAREA RUNOFF(CFS) =   53.73
  EFFECTIVE AREA(ACRES) =   4391.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4391.9         PEAK FLOW RATE(CFS) =    2109.86
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.97   FLOW VELOCITY(FEET/SEC.) =   6.34
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1643.05   51.26    0.984  0.30( 0.30) 0.99    2167.1   11701.00
      2     2098.20   83.61    0.796  0.30( 0.30) 0.99    4311.9   11620.00
      3     2109.86   85.39    0.787  0.30( 0.30) 0.99    4391.9   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2109.86  Tc(MIN.) =   85.39
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4391.87
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     4391.9  TC(MIN.) =     85.39
  EFFECTIVE AREA(ACRES) =   4391.87  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.995
  PEAK FLOW RATE(CFS)   =    2109.86

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1643.05   51.26    0.984  0.30( 0.30) 0.99    2167.1   11701.00
      2     2098.20   83.61    0.796  0.30( 0.30) 0.99    4311.9   11620.00
      3     2109.86   85.39    0.787  0.30( 0.30) 0.99    4391.9   11600.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S18.DAT
  TIME/DATE OF STUDY: 13:49 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.127
   2)   10.00;  2.710
   3)   15.00;  1.941
   4)   20.00;  1.664
   5)   25.00;  1.445
   6)   30.00;  1.288
   7)   40.00;  1.110
   8)   50.00;  0.991
   9)   60.00;  0.906
  10)   90.00;  0.761
  11)  120.00;  0.681
  12)  180.00;  0.576
  13)  360.00;  0.434
  14) 1440.00;  0.193
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11801.00 TO NODE  11802.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   970.31
  ELEVATION DATA: UPSTREAM(FEET) =    834.89  DOWNSTREAM(FEET) =    727.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.170
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.821
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        7.24      0.30     1.000     0   17.17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.91
  TOTAL AREA(ACRES) =      7.24   PEAK FLOW RATE(CFS) =      9.91

**************************************************************************
  FLOW PROCESS FROM NODE  11802.00 TO NODE  11803.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    727.50  DOWNSTREAM(FEET) =    674.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   968.10   CHANNEL SLOPE =  0.0551
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.59
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.595
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.08      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.65
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   4.41
  Tc(MIN.) =   21.58
  SUBAREA AREA(ACRES) =    22.08       SUBAREA RUNOFF(CFS) =   25.73
  EFFECTIVE AREA(ACRES) =     29.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3          PEAK FLOW RATE(CFS) =      34.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   4.20
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11803.00 =    1938.41 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11803.00 TO NODE  11804.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    674.12  DOWNSTREAM(FEET) =    554.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.27   CHANNEL SLOPE =  0.0642
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.360
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.08
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   6.11
  Tc(MIN.) =   27.70
  SUBAREA AREA(ACRES) =    35.55       SUBAREA RUNOFF(CFS) =   33.93
  EFFECTIVE AREA(ACRES) =     64.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       64.9         PEAK FLOW RATE(CFS) =      61.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   5.42
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11804.00 =    3802.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    554.40  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1767.25   CHANNEL SLOPE =  0.0738
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.243
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
  AVERAGE FLOW DEPTH(FEET) =   1.05   TRAVEL TIME(MIN.) =   4.83
  Tc(MIN.) =   32.52
  SUBAREA AREA(ACRES) =    36.70       SUBAREA RUNOFF(CFS) =   31.15
  EFFECTIVE AREA(ACRES) =    101.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      101.6         PEAK FLOW RATE(CFS) =      86.22
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   6.31
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11821.00 =    5569.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S15.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    10818.43   43.08  0.30( 0.30) 1.00    7394.5   11500.00
      2    10979.15   44.84  0.30( 0.30) 1.00    7881.9   11530.00
      3    11660.96   53.31  0.30( 0.30) 1.00   10103.1   11000.00
      4    13166.31   64.54  0.30( 0.30) 1.00   14363.5   11330.00
      5    13368.10   66.21  0.30( 0.30) 1.00   15035.9   10850.00
      6    13396.08   67.37  0.30( 0.30) 1.00   15458.1   10800.00
      7    13739.64   69.94  0.30( 0.30) 1.00   16604.1   11300.00
      8    13938.42   73.32  0.30( 0.30) 1.00   17776.9   10630.00
      9    13511.51   86.11  0.30( 0.30) 1.00   21070.4   10600.00
     10    13420.26   91.00  0.30( 0.30) 1.00   22357.2   11111.00
     11    13404.50   91.78  0.30( 0.30) 1.00   22547.1   11101.00
     12    13350.29   93.81  0.30( 0.30) 1.00   22952.6   10500.00
     13    13225.56   98.06  0.30( 0.30) 1.00   23741.9   10710.00
     14    13107.51  100.64  0.30( 0.30) 1.00   24128.6   10410.00
     15    12833.56  106.09  0.30( 0.30) 1.00   24841.7   10700.00
     16    12504.75  112.50  0.30( 0.30) 1.00   25621.8   10400.00
     17    12282.05  116.19  0.30( 0.30) 1.00   25995.5   10200.00
     18    11952.10  123.18  0.30( 0.30) 1.00   26615.0   10320.00
     19    11622.50  127.67  0.30( 0.30) 1.00   26777.2   10210.00
     20     9900.17  159.24  0.30( 0.30) 1.00   27497.1   10100.00
    TOTAL AREA(ACRES) =    27497.1

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S17.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1643.05   51.26  0.30( 0.30) 0.99    2167.1   11701.00
      2     2098.20   83.61  0.30( 0.30) 0.99    4311.9   11620.00
      3     2109.86   85.39  0.30( 0.30) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =     4391.9
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1643.05   51.26  0.30( 0.30) 0.99    2167.1   11701.00
      2     2098.20   83.61  0.30( 0.30) 0.99    4311.9   11620.00
      3     2109.86   85.39  0.30( 0.30) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =      4391.9

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1643.05   51.26    0.980  0.30( 0.30) 0.99    2167.1   11701.00
      2     2098.20   83.61    0.792  0.30( 0.30) 0.99    4311.9   11620.00
      3     2109.86   85.39    0.783  0.30( 0.30) 0.99    4391.9   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10818.43   43.08    1.073  0.30( 0.30) 1.00    7394.5   11500.00
      2    10979.15   44.84    1.052  0.30( 0.30) 1.00    7881.9   11530.00
      3    11660.96   53.31    0.963  0.30( 0.30) 1.00   10103.1   11000.00
      4    13166.31   64.54    0.884  0.30( 0.30) 1.00   14363.5   11330.00
      5    13368.10   66.21    0.876  0.30( 0.30) 1.00   15035.9   10850.00
      6    13396.08   67.37    0.870  0.30( 0.30) 1.00   15458.1   10800.00
      7    13739.64   69.94    0.858  0.30( 0.30) 1.00   16604.1   11300.00
      8    13938.42   73.32    0.842  0.30( 0.30) 1.00   17776.9   10630.00
      9    13511.51   86.11    0.780  0.30( 0.30) 1.00   21070.4   10600.00
     10    13420.26   91.00    0.758  0.30( 0.30) 1.00   22357.2   11111.00
     11    13404.50   91.78    0.756  0.30( 0.30) 1.00   22547.1   11101.00
     12    13350.29   93.81    0.751  0.30( 0.30) 1.00   22952.6   10500.00
     13    13225.56   98.06    0.740  0.30( 0.30) 1.00   23741.9   10710.00
     14    13107.51  100.64    0.733  0.30( 0.30) 1.00   24128.6   10410.00
     15    12833.56  106.09    0.718  0.30( 0.30) 1.00   24841.7   10700.00
     16    12504.75  112.50    0.701  0.30( 0.30) 1.00   25621.8   10400.00
     17    12282.05  116.19    0.691  0.30( 0.30) 1.00   25995.5   10200.00
     18    11952.10  123.18    0.675  0.30( 0.30) 1.00   26615.0   10320.00
     19    11622.50  127.67    0.668  0.30( 0.30) 1.00   26777.2   10210.00
     20     9900.17  159.24    0.612  0.30( 0.30) 1.00   27497.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12387.51   43.08    1.073  0.30( 0.30) 0.99    9215.8   11500.00
```



```
      2    12568.18   44.84    1.052  0.30( 0.30) 0.99    9777.5   11530.00
      3    13139.00   51.26    0.980  0.30( 0.30) 1.00   11732.6   11701.00
      4    13332.89   53.31    0.963  0.30( 0.30) 1.00   12406.2   11000.00
      5    14996.28   64.54    0.884  0.30( 0.30) 1.00   17411.4   11330.00
      6    15221.56   66.21    0.876  0.30( 0.30) 1.00   18194.5   10850.00
      7    15265.78   67.37    0.870  0.30( 0.30) 1.00   18693.2   10800.00
      8    15645.53   69.94    0.858  0.30( 0.30) 1.00   20009.7   11300.00
      9    15891.94   73.32    0.842  0.30( 0.30) 1.00   21407.0   10630.00
     10    15693.35   83.61    0.792  0.30( 0.30) 1.00   24737.0   11620.00
     11    15645.52   85.39    0.783  0.30( 0.30) 1.00   25275.9   11600.00
     12    15606.16   86.11    0.780  0.30( 0.30) 1.00   25462.2   10600.00
     13    15421.62   91.00    0.758  0.30( 0.30) 1.00   26749.0   11111.00
     14    15396.81   91.78    0.756  0.30( 0.30) 1.00   26939.0   11101.00
     15    15318.96   93.81    0.751  0.30( 0.30) 1.00   27344.4   10500.00
     16    15145.00   98.06    0.740  0.30( 0.30) 1.00   28133.8   10710.00
     17    14996.96  100.64    0.733  0.30( 0.30) 1.00   28520.5   10410.00
     18    14659.86  106.09    0.718  0.30( 0.30) 1.00   29233.6   10700.00
     19    14256.59  112.50    0.701  0.30( 0.30) 1.00   30013.6   10400.00
     20    13991.07  116.19    0.691  0.30( 0.30) 1.00   30387.4   10200.00
     21    13592.75  123.18    0.675  0.30( 0.30) 1.00   31006.8   10320.00
     22    13228.97  127.67    0.668  0.30( 0.30) 1.00   31169.0   10210.00
     23    11266.31  159.24    0.612  0.30( 0.30) 1.00   31889.0   10100.00
    TOTAL AREA(ACRES) =     31889.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    15891.94  Tc(MIN.) =   73.325
  EFFECTIVE AREA(ACRES) =  21407.01  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    31889.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11726.00 TO NODE  11821.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.21  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1621.39   CHANNEL SLOPE =  0.0076
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.46
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.831
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       59.69      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   15906.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.19
  AVERAGE FLOW DEPTH(FEET) =   9.46   TRAVEL TIME(MIN.) =   2.22
  Tc(MIN.) =   75.54
  SUBAREA AREA(ACRES) =    59.69       SUBAREA RUNOFF(CFS) =   28.52
  EFFECTIVE AREA(ACRES) =  21466.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    31948.7         PEAK FLOW RATE(CFS) =   15891.94
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.46 FLOW VELOCITY(FEET/SEC.) = 12.19
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12387.51	45.47	1.045	0.30(0.30)	0.99	9275.5	11500.00
2	12568.18	47.22	1.024	0.30(0.30)	0.99	9837.1	11530.00
3	13139.00	53.61	0.960	0.30(0.30)	1.00	11792.3	11701.00
4	13332.89	55.65	0.943	0.30(0.30)	1.00	12465.9	11000.00
5	14996.28	66.80	0.873	0.30(0.30)	1.00	17471.1	11330.00
6	15221.56	68.46	0.865	0.30(0.30)	1.00	18254.2	10850.00
7	15265.78	69.61	0.860	0.30(0.30)	1.00	18752.9	10800.00
8	15645.53	72.17	0.847	0.30(0.30)	1.00	20069.4	11300.00
9	15891.94	75.54	0.831	0.30(0.30)	1.00	21466.7	10630.00
10	15693.35	85.83	0.781	0.30(0.30)	1.00	24796.7	11620.00
11	15645.52	87.62	0.773	0.30(0.30)	1.00	25335.6	11600.00
12	15606.16	88.34	0.769	0.30(0.30)	1.00	25521.9	10600.00
13	15421.62	93.23	0.752	0.30(0.30)	1.00	26808.7	11111.00
14	15396.81	94.01	0.750	0.30(0.30)	1.00	26998.7	11101.00
15	15318.96	96.05	0.745	0.30(0.30)	1.00	27404.1	10500.00
16	15145.00	100.31	0.734	0.30(0.30)	1.00	28193.5	10710.00
17	14996.96	102.90	0.727	0.30(0.30)	1.00	28580.2	10410.00
18	14659.86	108.36	0.712	0.30(0.30)	1.00	29293.3	10700.00
19	14256.59	114.79	0.695	0.30(0.30)	1.00	30073.3	10400.00
20	13991.07	118.50	0.685	0.30(0.30)	1.00	30447.1	10200.00
21	13592.75	125.51	0.671	0.30(0.30)	1.00	31066.5	10320.00
22	13228.97	130.02	0.663	0.30(0.30)	1.00	31228.7	10210.00
23	11266.31	161.71	0.608	0.30(0.30)	1.00	31948.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	86.22	32.52	1.243	0.30(0.30)	1.00	101.6	11801.00

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11298.48	32.52	1.243	0.30(0.30)	0.99	6735.8	11801.00
2	12455.61	45.47	1.045	0.30(0.30)	0.99	9377.0	11500.00
3	12634.38	47.22	1.024	0.30(0.30)	0.99	9938.7	11530.00
4	13199.37	53.61	0.960	0.30(0.30)	1.00	11893.9	11701.00
5	13391.67	55.65	0.943	0.30(0.30)	1.00	12567.5	11000.00
6	15048.68	66.80	0.873	0.30(0.30)	1.00	17572.6	11330.00
7	15273.23	68.46	0.865	0.30(0.30)	1.00	18355.7	10850.00

8	15316.94	69.61	0.860	0.30(0.30)	1.00	18854.4	10800.00
9	15695.56	72.17	0.847	0.30(0.30)	1.00	20171.0	11300.00
10	15940.47	75.54	0.831	0.30(0.30)	1.00	21568.3	10630.00
11	15737.33	85.83	0.781	0.30(0.30)	1.00	24898.3	11620.00
12	15688.72	87.62	0.773	0.30(0.30)	1.00	25437.2	11600.00
13	15649.04	88.34	0.769	0.30(0.30)	1.00	25623.5	10600.00
14	15462.98	93.23	0.752	0.30(0.30)	1.00	26910.3	11111.00
15	15437.98	94.01	0.750	0.30(0.30)	1.00	27100.3	11101.00
16	15359.63	96.05	0.745	0.30(0.30)	1.00	27505.7	10500.00
17	15184.63	100.31	0.734	0.30(0.30)	1.00	28295.1	10710.00
18	15035.96	102.90	0.727	0.30(0.30)	1.00	28681.8	10410.00
19	14697.54	108.36	0.712	0.30(0.30)	1.00	29394.8	10700.00
20	14292.69	114.79	0.695	0.30(0.30)	1.00	30174.9	10400.00
21	14026.27	118.50	0.685	0.30(0.30)	1.00	30548.7	10200.00
22	13626.70	125.51	0.671	0.30(0.30)	1.00	31168.1	10320.00
23	13262.20	130.02	0.663	0.30(0.30)	1.00	31330.3	10210.00
24	11294.47	161.71	0.608	0.30(0.30)	1.00	32050.3	10100.00

TOTAL AREA(ACRES) = 32050.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 15940.47 Tc(MIN.) = 75.541
EFFECTIVE AREA(ACRES) = 21568.27 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32050.3
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 423.93 DOWNSTREAM(FEET) = 402.38
CHANNEL LENGTH THRU SUBAREA(FEET) = 1912.90 CHANNEL SLOPE = 0.0113
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.89
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.818
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.91	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15987.53
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.84
AVERAGE FLOW DEPTH(FEET) = 5.89 TRAVEL TIME(MIN.) = 2.69
Tc(MIN.) = 78.23
SUBAREA AREA(ACRES) = 201.91 SUBAREA RUNOFF(CFS) = 94.12
EFFECTIVE AREA(ACRES) = 21770.18 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32252.2 PEAK FLOW RATE(CFS) = 15940.47
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

```
  DEPTH(FEET) =  5.88   FLOW VELOCITY(FEET/SEC.) =  11.82
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11822.00 =   92657.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    402.38  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2380.10   CHANNEL SLOPE =  0.0091
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.27
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.800
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   15966.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.03
  AVERAGE FLOW DEPTH(FEET) =   6.26   TRAVEL TIME(MIN.) =   3.60
  Tc(MIN.) =   81.83
  SUBAREA AREA(ACRES) =   116.13       SUBAREA RUNOFF(CFS) =   52.32
  EFFECTIVE AREA(ACRES) =  21886.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    32368.3         PEAK FLOW RATE(CFS) =   15940.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.25   FLOW VELOCITY(FEET/SEC.) =  11.02
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   81.83
  RAINFALL INTENSITY(INCH/HR) =   0.80
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   21886.31
  TOTAL STREAM AREA(ACRES) =   32368.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   15940.47

****************************************************************************
  FLOW PROCESS FROM NODE  11831.00 TO NODE  11832.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```



```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.20
  ELEVATION DATA: UPSTREAM(FEET) =   1353.30  DOWNSTREAM(FEET) =   1280.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.179
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.226
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.76      0.30     1.000     0    8.18
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.00
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      2.00

****************************************************************************
  FLOW PROCESS FROM NODE  11832.00 TO NODE  11833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1280.02  DOWNSTREAM(FEET) =   1070.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   686.67   CHANNEL SLOPE =  0.3057
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.20
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.576
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.25
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.69
  Tc(MIN.) =   10.87
  SUBAREA AREA(ACRES) =     5.95       SUBAREA RUNOFF(CFS) =   12.19
  EFFECTIVE AREA(ACRES) =      6.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =      13.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   5.26
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11833.00 =     934.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11833.00 TO NODE  11834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1070.08  DOWNSTREAM(FEET) =    913.56
 CHANNEL LENGTH THRU SUBAREA(FEET) =   977.36   CHANNEL SLOPE =  0.1601
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.149
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       23.21      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.28
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.87
 AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   2.77
 Tc(MIN.) =   13.65
 SUBAREA AREA(ACRES) =    23.21       SUBAREA RUNOFF(CFS) =   38.62
 EFFECTIVE AREA(ACRES) =     29.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       29.9         PEAK FLOW RATE(CFS) =      49.79
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   6.83
 LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11834.00 =    1912.23 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11834.00 TO NODE  11835.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    913.56  DOWNSTREAM(FEET) =    727.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.63   CHANNEL SLOPE =  0.0989
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.779
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       73.73      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      99.14
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.30
 AVERAGE FLOW DEPTH(FEET) =   1.11   TRAVEL TIME(MIN.) =   4.28
 Tc(MIN.) =   17.93
 SUBAREA AREA(ACRES) =    73.73       SUBAREA RUNOFF(CFS) =   98.13
 EFFECTIVE AREA(ACRES) =    103.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      103.7         PEAK FLOW RATE(CFS) =     137.95
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.34
```



```
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.34   FLOW VELOCITY(FEET/SEC.) =   8.12
 LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11835.00 =    3787.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11835.00 TO NODE  11836.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    727.99  DOWNSTREAM(FEET) =    611.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.64   CHANNEL SLOPE =  0.0615
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.88
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.573
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       93.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     191.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.60
 AVERAGE FLOW DEPTH(FEET) =   1.84   TRAVEL TIME(MIN.) =   4.16
 Tc(MIN.) =   22.09
 SUBAREA AREA(ACRES) =    93.31       SUBAREA RUNOFF(CFS) =  106.87
 EFFECTIVE AREA(ACRES) =    196.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      197.0         PEAK FLOW RATE(CFS) =     225.58
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.01

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.01   FLOW VELOCITY(FEET/SEC.) =   8.00
 LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11836.00 =    5684.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11836.00 TO NODE  11837.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    611.39  DOWNSTREAM(FEET) =    508.59
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2178.15   CHANNEL SLOPE =  0.0472
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.389
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       98.92      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     274.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.72
```

```
  AVERAGE FLOW DEPTH(FEET) =   2.40   TRAVEL TIME(MIN.) =   4.71
  Tc(MIN.) =   26.79
  SUBAREA AREA(ACRES) =    98.92       SUBAREA RUNOFF(CFS) =   96.93
  EFFECTIVE AREA(ACRES) =    295.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      295.9         PEAK FLOW RATE(CFS) =     289.92
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.47   FLOW VELOCITY(FEET/SEC.) =   7.84
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11837.00 =    7862.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11837.00 TO NODE  11838.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    508.59  DOWNSTREAM(FEET) =    448.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1942.91   CHANNEL SLOPE =  0.0309
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.96
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.262
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     324.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.95
  AVERAGE FLOW DEPTH(FEET) =   2.94   TRAVEL TIME(MIN.) =   4.66
  Tc(MIN.) =   31.45
  SUBAREA AREA(ACRES) =    79.71       SUBAREA RUNOFF(CFS) =   69.03
  EFFECTIVE AREA(ACRES) =    375.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      375.6         PEAK FLOW RATE(CFS) =     325.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.94   FLOW VELOCITY(FEET/SEC.) =   6.96
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.00 =    9805.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.00 TO NODE  11838.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    448.50  DOWNSTREAM(FEET) =    420.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =   917.65   CHANNEL SLOPE =  0.0302
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



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  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.03
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.223
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     339.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.97
  AVERAGE FLOW DEPTH(FEET) =   3.03   TRAVEL TIME(MIN.) =   2.19
  Tc(MIN.) =   33.65
  SUBAREA AREA(ACRES) =    34.57       SUBAREA RUNOFF(CFS) =   28.72
  EFFECTIVE AREA(ACRES) =    410.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      410.2         PEAK FLOW RATE(CFS) =     340.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.03   FLOW VELOCITY(FEET/SEC.) =   6.99
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.50 =   10723.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    420.79  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1615.83   CHANNEL SLOPE =  0.0248
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.24
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.54      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     349.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.54
  AVERAGE FLOW DEPTH(FEET) =   3.24   TRAVEL TIME(MIN.) =   4.12
  Tc(MIN.) =   37.76
  SUBAREA AREA(ACRES) =    21.54       SUBAREA RUNOFF(CFS) =   16.48
  EFFECTIVE AREA(ACRES) =    431.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      431.7         PEAK FLOW RATE(CFS) =     340.77
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.19   FLOW VELOCITY(FEET/SEC.) =   6.51
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11841.00 =   12339.04 FEET.
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****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   37.76
  RAINFALL INTENSITY(INCH/HR) =   1.15
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     431.70
  TOTAL STREAM AREA(ACRES) =     431.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     340.77

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11298.48   39.62    1.117  0.30( 0.30) 0.99    7053.9   11801.00
      1    12455.61   52.32    0.971  0.30( 0.30) 0.99    9695.1   11500.00
      1    12634.38   54.04    0.957  0.30( 0.30) 0.99   10256.8   11530.00
      1    13199.37   60.33    0.904  0.30( 0.30) 1.00   12211.9   11701.00
      1    13391.67   62.34    0.895  0.30( 0.30) 1.00   12885.5   11000.00
      1    15048.68   73.22    0.842  0.30( 0.30) 1.00   17890.7   11330.00
      1    15273.23   74.85    0.834  0.30( 0.30) 1.00   18673.8   10850.00
      1    15316.94   75.99    0.829  0.30( 0.30) 1.00   19172.5   10800.00
      1    15695.56   78.49    0.817  0.30( 0.30) 1.00   20489.0   11300.00
      1    15940.47   81.83    0.800  0.30( 0.30) 1.00   21886.3   10630.00
      1    15737.33   92.15    0.755  0.30( 0.30) 1.00   25216.3   11620.00
      1    15688.72   93.94    0.750  0.30( 0.30) 1.00   25755.2   11600.00
      1    15649.04   94.67    0.749  0.30( 0.30) 1.00   25941.5   10600.00
      1    15462.98   99.59    0.735  0.30( 0.30) 1.00   27228.3   11111.00
      1    15437.98  100.38    0.733  0.30( 0.30) 1.00   27418.3   11101.00
      1    15359.63  102.43    0.728  0.30( 0.30) 1.00   27823.7   10500.00
      1    15184.63  106.70    0.716  0.30( 0.30) 1.00   28613.1   10710.00
      1    15035.96  109.32    0.709  0.30( 0.30) 1.00   28999.8   10410.00
      1    14697.54  114.83    0.695  0.30( 0.30) 1.00   29712.9   10700.00
      1    14292.69  121.33    0.679  0.30( 0.30) 1.00   30492.9   10400.00
      1    14026.27  125.08    0.672  0.30( 0.30) 1.00   30866.7   10200.00
      1    13626.70  132.15    0.660  0.30( 0.30) 1.00   31486.1   10320.00
      1    13262.20  136.73    0.652  0.30( 0.30) 1.00   31648.3   10210.00
      1    11294.47  168.80    0.596  0.30( 0.30) 1.00   32368.3   10100.00
      2      340.77   37.76    1.150  0.30( 0.30) 1.00     431.7   11831.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11544.87   37.76    1.150  0.30( 0.30) 1.00    7155.8   11831.00
      2    11626.03   39.62    1.117  0.30( 0.30) 1.00    7485.6   11801.00
      3    12724.79   52.32    0.971  0.30( 0.30) 1.00   10126.8   11500.00
      4    12897.72   54.04    0.957  0.30( 0.30) 1.00   10688.5   11530.00
      5    13441.75   60.33    0.904  0.30( 0.30) 1.00   12643.6   11701.00
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      6    13630.15   62.34    0.895  0.30( 0.30) 1.00   13317.2   11000.00
      7    15266.08   73.22    0.842  0.30( 0.30) 1.00   18322.4   11330.00
      8    15487.47   74.85    0.834  0.30( 0.30) 1.00   19105.5   10850.00
      9    15528.96   75.99    0.829  0.30( 0.30) 1.00   19604.2   10800.00
     10    15902.73   78.49    0.817  0.30( 0.30) 1.00   20920.7   11300.00
     11    16141.18   81.83    0.800  0.30( 0.30) 1.00   22318.0   10630.00
     12    15919.91   92.15    0.755  0.30( 0.30) 1.00   25648.0   11620.00
     13    15869.38   93.94    0.750  0.30( 0.30) 1.00   26186.9   11600.00
     14    15828.92   94.67    0.749  0.30( 0.30) 1.00   26373.2   10600.00
     15    15637.60   99.59    0.735  0.30( 0.30) 1.00   27660.0   11111.00
     16    15611.76  100.38    0.733  0.30( 0.30) 1.00   27850.0   11101.00
     17    15531.21  102.43    0.728  0.30( 0.30) 1.00   28255.4   10500.00
     18    15351.65  106.70    0.716  0.30( 0.30) 1.00   29044.8   10710.00
     19    15200.18  109.32    0.709  0.30( 0.30) 1.00   29431.5   10410.00
     20    14855.86  114.83    0.695  0.30( 0.30) 1.00   30144.6   10700.00
     21    14444.55  121.33    0.679  0.30( 0.30) 1.00   30924.6   10400.00
     22    14175.50  125.08    0.672  0.30( 0.30) 1.00   31298.4   10200.00
     23    13770.97  132.15    0.660  0.30( 0.30) 1.00   31917.8   10320.00
     24    13403.26  136.73    0.652  0.30( 0.30) 1.00   32080.0   10210.00
     25    11413.02  168.80    0.596  0.30( 0.30) 1.00   32800.0   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   16141.18    Tc(MIN.) =    81.83
  EFFECTIVE AREA(ACRES) =   22318.01   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    32800.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  12527.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.74  DOWNSTREAM(FEET) =    347.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2830.43   CHANNEL SLOPE =  0.0118
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.86
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.782
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.59      0.30     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   16166.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.04
  AVERAGE FLOW DEPTH(FEET) =   5.85   TRAVEL TIME(MIN.) =   3.92
  Tc(MIN.) =   85.75
  SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =   50.63
  EFFECTIVE AREA(ACRES) =  22434.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    32916.6         PEAK FLOW RATE(CFS) =   16141.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.85
```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.85 FLOW VELOCITY(FEET/SEC.) = 12.04
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 85.75
EFFECTIVE AREA(ACRES) = 22434.60 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997
PEAK FLOW RATE(CFS) = 16141.18

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11544.87	42.17	1.084	0.30(0.30)	1.00	7272.4	11831.00
2	11626.03	44.01	1.062	0.30(0.30)	1.00	7602.1	11801.00
3	12724.79	56.58	0.935	0.30(0.30)	1.00	10243.4	11500.00
4	12897.72	58.27	0.921	0.30(0.30)	1.00	10805.0	11530.00
5	13441.75	64.50	0.884	0.30(0.30)	1.00	12760.2	11701.00
6	13630.15	66.49	0.875	0.30(0.30)	1.00	13433.8	11000.00
7	15266.08	77.21	0.823	0.30(0.30)	1.00	18439.0	11330.00
8	15487.47	78.82	0.815	0.30(0.30)	1.00	19222.1	10850.00
9	15528.96	79.96	0.810	0.30(0.30)	1.00	19720.8	10800.00
10	15902.73	82.43	0.798	0.30(0.30)	1.00	21037.3	11300.00
11	16141.18	85.75	0.782	0.30(0.30)	1.00	22434.6	10630.00
12	15919.91	96.09	0.745	0.30(0.30)	1.00	25764.6	11620.00
13	15869.38	97.88	0.740	0.30(0.30)	1.00	26303.5	11600.00
14	15828.92	98.62	0.738	0.30(0.30)	1.00	26489.8	10600.00
15	15637.60	103.55	0.725	0.30(0.30)	1.00	27776.6	11111.00
16	15611.76	104.34	0.723	0.30(0.30)	1.00	27966.6	11101.00
17	15531.21	106.40	0.717	0.30(0.30)	1.00	28372.0	10500.00
18	15351.65	110.69	0.706	0.30(0.30)	1.00	29161.4	10710.00
19	15200.18	113.32	0.699	0.30(0.30)	1.00	29548.1	10410.00
20	14855.86	118.86	0.684	0.30(0.30)	1.00	30261.2	10700.00
21	14444.55	125.40	0.672	0.30(0.30)	1.00	31041.2	10400.00
22	14175.50	129.18	0.665	0.30(0.30)	1.00	31415.0	10200.00
23	13770.97	136.29	0.652	0.30(0.30)	1.00	32034.4	10320.00
24	13403.26	140.90	0.644	0.30(0.30)	1.00	32196.6	10210.00
25	11413.02	173.23	0.588	0.30(0.30)	1.00	32916.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S19.DAT
  TIME/DATE OF STUDY: 08:54 09/12/2017
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.927
   2)   10.00;  2.601
   3)   15.00;  1.897
   4)   20.00;  1.624
   5)   25.00;  1.414
   6)   30.00;  1.266
   7)   40.00;  1.086
   8)   50.00;  0.968
   9)   60.00;  0.881
  10)   90.00;  0.734
  11)  120.00;  0.652
  12)  180.00;  0.549
  13)  360.00;  0.408
  14) 1200.00;  0.180
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11900.00 TO NODE  11901.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.79
  ELEVATION DATA: UPSTREAM(FEET) =   2369.48  DOWNSTREAM(FEET) =   2332.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.203
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.343
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"          -        1.62      0.30     0.999     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  SUBAREA RUNOFF(CFS) =      4.44
  TOTAL AREA(ACRES) =      1.62   PEAK FLOW RATE(CFS) =      4.44

************************************************************************
  FLOW PROCESS FROM NODE  11901.00 TO NODE  11902.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2332.92  DOWNSTREAM(FEET) =   2297.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   664.26   CHANNEL SLOPE =  0.0530
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.467
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.35      0.30     0.906     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.95
  AVERAGE FLOW DEPTH(FEET) =   0.40   TRAVEL TIME(MIN.) =   3.75
  Tc(MIN.) =   10.95
  SUBAREA AREA(ACRES) =     8.35       SUBAREA RUNOFF(CFS) =   16.50
  EFFECTIVE AREA(ACRES) =      9.97     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =       10.0          PEAK FLOW RATE(CFS) =      19.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   3.41
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.00 =     960.05 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11902.00 TO NODE  11902.50 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2297.70  DOWNSTREAM(FEET) =   2263.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.77   CHANNEL SLOPE =  0.0369
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.931
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.48      0.30     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.06
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   14.76
  SUBAREA AREA(ACRES) =    34.48       SUBAREA RUNOFF(CFS) =   51.49
  EFFECTIVE AREA(ACRES) =     44.45     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.91
  TOTAL AREA(ACRES) =       44.5         PEAK FLOW RATE(CFS) =      66.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   4.59
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.50 =    1888.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11902.50 TO NODE  11903.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.40  DOWNSTREAM(FEET) =   2252.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   895.50   CHANNEL SLOPE =  0.0126
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.669
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.65      0.30     0.958     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.958
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.38
  AVERAGE FLOW DEPTH(FEET) =   1.77   TRAVEL TIME(MIN.) =   4.42
  Tc(MIN.) =   19.18
  SUBAREA AREA(ACRES) =    23.65       SUBAREA RUNOFF(CFS) =   29.40
  EFFECTIVE AREA(ACRES) =     68.10     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       68.1         PEAK FLOW RATE(CFS) =      85.26
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.82   FLOW VELOCITY(FEET/SEC.) =   3.43
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11903.00 =    2784.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11903.00 TO NODE  11904.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2252.14  DOWNSTREAM(FEET) =   2186.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.35   CHANNEL SLOPE =  0.0343
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.73
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.410
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.53      0.30     0.961     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.961
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     119.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.39
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   5.95
  Tc(MIN.) =   25.13
  SUBAREA AREA(ACRES) =    68.53       SUBAREA RUNOFF(CFS) =   69.20
  EFFECTIVE AREA(ACRES) =    136.63     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      136.6         PEAK FLOW RATE(CFS) =     138.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =   5.64
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11904.00 =    4708.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11904.00 TO NODE  11905.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2186.04  DOWNSTREAM(FEET) =   1957.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.87   CHANNEL SLOPE =  0.1187
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.44
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.306
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       63.15      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     167.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.16
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   3.51
  Tc(MIN.) =   28.64
  SUBAREA AREA(ACRES) =    63.15       SUBAREA RUNOFF(CFS) =   57.20
  EFFECTIVE AREA(ACRES) =    199.78     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      199.8         PEAK FLOW RATE(CFS) =     183.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.49   FLOW VELOCITY(FEET/SEC.) =   9.45
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11905.00 =    6635.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11905.00 TO NODE  11906.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1957.34  DOWNSTREAM(FEET) =   1244.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2498.96   CHANNEL SLOPE =  0.2854
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.30
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.235
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     218.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.45
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   3.10
  Tc(MIN.) =   31.73
  SUBAREA AREA(ACRES) =    84.87       SUBAREA RUNOFF(CFS) =   71.41
  EFFECTIVE AREA(ACRES) =    284.65     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      284.6         PEAK FLOW RATE(CFS) =     241.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =  13.93
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11906.00 =    9134.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   1244.16  DOWNSTREAM(FEET) =    873.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3370.75   CHANNEL SLOPE =  0.1098
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.10
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.141
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     317.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.83
  AVERAGE FLOW DEPTH(FEET) =   2.07   TRAVEL TIME(MIN.) =   5.19
  Tc(MIN.) =   36.92
  SUBAREA AREA(ACRES) =   199.43       SUBAREA RUNOFF(CFS) =  151.04
  EFFECTIVE AREA(ACRES) =    484.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      484.1         PEAK FLOW RATE(CFS) =     368.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.25   FLOW VELOCITY(FEET/SEC.) =  11.33
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11920.00 =   12505.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   36.92
  RAINFALL INTENSITY(INCH/HR) =   1.14
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98
  EFFECTIVE STREAM AREA(ACRES) =     484.08
  TOTAL STREAM AREA(ACRES) =     484.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     368.73

****************************************************************************
  FLOW PROCESS FROM NODE  11910.00 TO NODE  11911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   517.62
  ELEVATION DATA: UPSTREAM(FEET) =   2531.88  DOWNSTREAM(FEET) =   2441.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.185
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.293
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -       3.46      0.30      1.000     0   12.19
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.21
  TOTAL AREA(ACRES) =      3.46   PEAK FLOW RATE(CFS) =      6.21

****************************************************************************
  FLOW PROCESS FROM NODE  11911.00 TO NODE  11912.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2441.33  DOWNSTREAM(FEET) =   2382.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   397.30   CHANNEL SLOPE =  0.1488
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.047
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       5.79      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.79
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   1.75
  Tc(MIN.) =   13.93
  SUBAREA AREA(ACRES) =     5.79       SUBAREA RUNOFF(CFS) =    9.11
  EFFECTIVE AREA(ACRES) =      9.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =      14.55
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   4.23
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11912.00 =     914.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11912.00 TO NODE  11913.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2382.20  DOWNSTREAM(FEET) =   2263.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1891.47   CHANNEL SLOPE =  0.0626
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.609
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       54.30      0.30      1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.91
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   6.42
  Tc(MIN.) =   20.35
  SUBAREA AREA(ACRES) =    54.30       SUBAREA RUNOFF(CFS) =   63.98
  EFFECTIVE AREA(ACRES) =     63.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       63.5          PEAK FLOW RATE(CFS) =      74.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   5.71
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11913.00 =    2806.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11913.00 TO NODE  11914.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.77  DOWNSTREAM(FEET) =   1845.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1957.31   CHANNEL SLOPE =  0.2138
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.469
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       65.14      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     109.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.76
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   3.34
  Tc(MIN.) =   23.70
  SUBAREA AREA(ACRES) =    65.14       SUBAREA RUNOFF(CFS) =   68.53
  EFFECTIVE AREA(ACRES) =    128.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      128.7          PEAK FLOW RATE(CFS) =     135.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =  10.48
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11914.00 =    4763.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11914.00 TO NODE  11915.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1845.23  DOWNSTREAM(FEET) =   1557.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1686.78   CHANNEL SLOPE =  0.1708
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.373
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       78.52      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     173.32
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.51
 AVERAGE FLOW DEPTH(FEET) =   1.31   TRAVEL TIME(MIN.) =   2.68
 Tc(MIN.) =   26.37
 SUBAREA AREA(ACRES) =    78.52       SUBAREA RUNOFF(CFS) =   75.86
 EFFECTIVE AREA(ACRES) =    207.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      207.2          PEAK FLOW RATE(CFS) =     200.19
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =  11.02
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11915.00 =    6450.48 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11915.00 TO NODE  11916.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1557.21  DOWNSTREAM(FEET) =   1403.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.39   CHANNEL SLOPE =  0.0806
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.91
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.267
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       70.48      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     230.87
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.84
 AVERAGE FLOW DEPTH(FEET) =   1.89   TRAVEL TIME(MIN.) =   3.60
 Tc(MIN.) =   29.97
 SUBAREA AREA(ACRES) =    70.48       SUBAREA RUNOFF(CFS) =   61.33
 EFFECTIVE AREA(ACRES) =    277.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      277.7          PEAK FLOW RATE(CFS) =     241.64
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.94
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.94   FLOW VELOCITY(FEET/SEC.) =   8.97
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11916.00 =    8359.87 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11916.00 TO NODE  11917.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1403.38  DOWNSTREAM(FEET) =   1079.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1945.82   CHANNEL SLOPE =  0.1662
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.221
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      232.20      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     337.88
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.78
 AVERAGE FLOW DEPTH(FEET) =   1.91   TRAVEL TIME(MIN.) =   2.54
 Tc(MIN.) =   32.51
 SUBAREA AREA(ACRES) =   232.20       SUBAREA RUNOFF(CFS) =  192.45
 EFFECTIVE AREA(ACRES) =    509.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      509.9          PEAK FLOW RATE(CFS) =     422.60
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.16

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.16   FLOW VELOCITY(FEET/SEC.) =  13.65
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11917.00 =   10305.69 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1079.99  DOWNSTREAM(FEET) =    873.95
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2563.91   CHANNEL SLOPE =  0.0804
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.77
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      110.82      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     464.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.83
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  AVERAGE FLOW DEPTH(FEET) =   2.76   TRAVEL TIME(MIN.) =   3.95
  Tc(MIN.) =   36.46
  SUBAREA AREA(ACRES) =   110.82       SUBAREA RUNOFF(CFS) =   84.76
  EFFECTIVE AREA(ACRES) =    620.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      620.7         PEAK FLOW RATE(CFS) =     474.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.80   FLOW VELOCITY(FEET/SEC.) =  10.89
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   36.46
  RAINFALL INTENSITY(INCH/HR) =   1.15
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     620.71
  TOTAL STREAM AREA(ACRES) =     620.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     474.77

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      368.73   36.92    1.141  0.30( 0.30) 0.98     484.1   11900.00
      2      474.77   36.46    1.150  0.30( 0.30) 1.00     620.7   11910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      842.46   36.46    1.150  0.30( 0.30) 0.99    1098.7   11910.00
      2      838.84   36.92    1.141  0.30( 0.30) 0.99    1104.8   11900.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     842.46    Tc(MIN.) =    36.46
  EFFECTIVE AREA(ACRES) =    1098.72   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     1104.8
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11920.00 TO NODE  11921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



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============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    873.95  DOWNSTREAM(FEET) =    827.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1417.25   CHANNEL SLOPE =  0.0325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.104
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      107.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     881.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.29
  AVERAGE FLOW DEPTH(FEET) =   4.83   TRAVEL TIME(MIN.) =   2.54
  Tc(MIN.) =   39.00
  SUBAREA AREA(ACRES) =   107.47       SUBAREA RUNOFF(CFS) =   77.78
  EFFECTIVE AREA(ACRES) =   1206.19     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1212.3         PEAK FLOW RATE(CFS) =     874.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.81   FLOW VELOCITY(FEET/SEC.) =   9.27
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11921.00 =   14286.85 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      874.98   39.00    1.104  0.30( 0.30) 0.99    1206.2   11910.00
      2      870.23   39.47    1.096  0.30( 0.30) 0.99    1212.3   11900.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     874.98  Tc(MIN.) =   39.00
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1206.19

****************************************************************************
  FLOW PROCESS FROM NODE  11921.00 TO NODE  11922.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    827.94  DOWNSTREAM(FEET) =    753.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.43   CHANNEL SLOPE =  0.0394
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.90
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.062
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      344.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     993.03
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.30
  AVERAGE FLOW DEPTH(FEET) =   4.88   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   42.05
  SUBAREA AREA(ACRES) =   344.27       SUBAREA RUNOFF(CFS) =  236.06
  EFFECTIVE AREA(ACRES) =   1550.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1556.5         PEAK FLOW RATE(CFS) =    1065.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.05   FLOW VELOCITY(FEET/SEC.) =  10.48
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11922.00 =   16173.28 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1065.19   42.05    1.062  0.30( 0.30) 1.00    1550.5   11910.00
      2     1061.61   42.52    1.056  0.30( 0.30) 1.00    1556.5   11900.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1065.19  Tc(MIN.) =   42.05
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1550.46

****************************************************************************
  FLOW PROCESS FROM NODE  11922.00 TO NODE  11923.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    753.55  DOWNSTREAM(FEET) =    641.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.88   CHANNEL SLOPE =  0.0391
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.19
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.009
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.18      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1117.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.59
  AVERAGE FLOW DEPTH(FEET) =   5.18   TRAVEL TIME(MIN.) =   4.50
  Tc(MIN.) =   46.55
  SUBAREA AREA(ACRES) =   165.18       SUBAREA RUNOFF(CFS) =  105.36
  EFFECTIVE AREA(ACRES) =   1715.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1721.7         PEAK FLOW RATE(CFS) =    1096.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.13   FLOW VELOCITY(FEET/SEC.) =  10.54
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11923.00 =   19034.16 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1096.41   46.55    1.009  0.30( 0.30) 1.00    1715.6   11910.00
      2     1091.74   47.02    1.003  0.30( 0.30) 1.00    1721.7   11900.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1096.41  Tc(MIN.) =   46.55
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1715.64

****************************************************************************
  FLOW PROCESS FROM NODE  11923.00 TO NODE  11924.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    641.58  DOWNSTREAM(FEET) =    579.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1844.02   CHANNEL SLOPE =  0.0335
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.65
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.973
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      433.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1227.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.25
  AVERAGE FLOW DEPTH(FEET) =   5.63   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =   49.55
  SUBAREA AREA(ACRES) =   433.73       SUBAREA RUNOFF(CFS) =  262.85
  EFFECTIVE AREA(ACRES) =   2149.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2155.4         PEAK FLOW RATE(CFS) =    1304.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.80   FLOW VELOCITY(FEET/SEC.) =  10.41
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11924.00 =   20878.18 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1304.62   49.55    0.973  0.30( 0.30) 1.00    2149.4   11910.00
      2     1297.67   50.02    0.968  0.30( 0.30) 1.00    2155.4   11900.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1304.62  Tc(MIN.) =   49.55
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2149.37

****************************************************************************
  FLOW PROCESS FROM NODE  11924.00 TO NODE  11925.00 IS CODE =  56
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 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    579.89  DOWNSTREAM(FEET) =    494.12
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2756.15   CHANNEL SLOPE =  0.0311
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.07
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.933
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      265.42      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1380.25
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.29
 AVERAGE FLOW DEPTH(FEET) =   6.06   TRAVEL TIME(MIN.) =   4.46
 Tc(MIN.) =   54.02
 SUBAREA AREA(ACRES) =   265.42       SUBAREA RUNOFF(CFS) =  151.24
 EFFECTIVE AREA(ACRES) =   2414.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2420.9         PEAK FLOW RATE(CFS) =    1378.05
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.06

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.06   FLOW VELOCITY(FEET/SEC.) =  10.28
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11925.00 =   23634.33 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1378.05   54.02    0.933  0.30( 0.30) 1.00    2414.8   11910.00
     2     1372.46   54.50    0.929  0.30( 0.30) 1.00    2420.9   11900.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1378.05  Tc(MIN.) =   54.02
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2414.79

********************************************************************************
 FLOW PROCESS FROM NODE  11925.00 TO NODE  11926.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    494.12  DOWNSTREAM(FEET) =    458.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1922.70   CHANNEL SLOPE =  0.0186
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.91
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.900
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       97.46      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1404.39
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.54
 AVERAGE FLOW DEPTH(FEET) =   6.91   TRAVEL TIME(MIN.) =   3.75
 Tc(MIN.) =   57.77
 SUBAREA AREA(ACRES) =    97.46       SUBAREA RUNOFF(CFS) =   52.67
 EFFECTIVE AREA(ACRES) =   2512.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2518.3          PEAK FLOW RATE(CFS) =    1378.05
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.85

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.85   FLOW VELOCITY(FEET/SEC.) =   8.50
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11926.00 =   25557.03 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1378.05   57.77    0.900  0.30( 0.30) 1.00    2512.2   11910.00
     2     1372.46   58.25    0.896  0.30( 0.30) 1.00    2518.3   11900.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1378.05  Tc(MIN.) =   57.77
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2512.25

********************************************************************************
 FLOW PROCESS FROM NODE  11926.00 TO NODE  11927.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    458.40  DOWNSTREAM(FEET) =    399.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2170.13   CHANNEL SLOPE =  0.0274
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.28
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.874
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       53.83      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1391.95
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.83
 AVERAGE FLOW DEPTH(FEET) =   6.28   TRAVEL TIME(MIN.) =   3.68
 Tc(MIN.) =   61.45
 SUBAREA AREA(ACRES) =    53.83       SUBAREA RUNOFF(CFS) =   27.81
 EFFECTIVE AREA(ACRES) =   2566.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2572.1          PEAK FLOW RATE(CFS) =    1378.05
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.25
```

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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.25   FLOW VELOCITY(FEET/SEC.) =   9.81
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1378.05   61.45    0.874  0.30( 0.30) 1.00    2566.1   11910.00
     2     1372.46   61.94    0.872  0.30( 0.30) 1.00    2572.1   11900.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1378.05  Tc(MIN.) =   61.45
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2566.08

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610401V.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)         (ACRES)    NODE
     1      638.96   26.17  0.30( 0.30) 1.00     622.1   40120.00
     2      630.15   28.05  0.30( 0.30) 1.00     652.1   40100.00
   TOTAL AREA(ACRES) =      652.1

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1378.05   61.45    0.874  0.30( 0.30) 1.00    2566.1   11910.00
     2     1372.46   61.94    0.872  0.30( 0.30) 1.00    2572.1   11900.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      638.96   26.17    1.379  0.30( 0.30) 1.00     622.1   40120.00
     2      630.15   28.05    1.324  0.30( 0.30) 1.00     652.1   40100.00
 LONGEST FLOWPATH FROM NODE  40100.00 TO NODE  11927.00 =   10245.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1741.93   26.17    1.379  0.30( 0.30) 1.00    1715.0   40120.00
     2     1751.40   28.05    1.324  0.30( 0.30) 1.00    1823.3   40100.00
     3     1731.30   61.45    0.874  0.30( 0.30) 1.00    3218.1   11910.00
     4     1724.23   61.94    0.872  0.30( 0.30) 1.00    3224.2   11900.00
   TOTAL AREA(ACRES) =      3224.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
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```
 PEAK FLOW RATE(CFS) =     1751.40  Tc(MIN.) =   28.046
 EFFECTIVE AREA(ACRES) =   1823.30  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3224.2
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.50 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    399.00  DOWNSTREAM(FEET) =    384.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   986.26   CHANNEL SLOPE =  0.0152
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.02
 CHANNEL FLOW THRU SUBAREA(CFS) =    1751.40
 FLOW VELOCITY(FEET/SEC.) =   8.39   FLOW DEPTH(FEET) =   8.02
 TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =   30.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1741.93   28.13    1.321  0.30( 0.30) 1.00    1715.0   40120.00
     2     1751.40   30.00    1.266  0.30( 0.30) 1.00    1823.3   40100.00
     3     1731.30   63.41    0.864  0.30( 0.30) 1.00    3218.1   11910.00
     4     1724.23   63.90    0.862  0.30( 0.30) 1.00    3224.2   11900.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1751.40  Tc(MIN.) =   30.00
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1823.30

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610402V.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)         (ACRES)    NODE
     1       52.53   13.89  0.30( 0.30) 1.00      33.3   40200.00
   TOTAL AREA(ACRES) =       33.3

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
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```
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      1741.93   28.13    1.321  0.30( 0.30) 1.00    1715.0   40120.00
     2      1751.40   30.00    1.266  0.30( 0.30) 1.00    1823.3   40100.00
     3      1731.30   63.41    0.864  0.30( 0.30) 1.00    3218.1   11910.00
     4      1724.23   63.90    0.862  0.30( 0.30) 1.00    3224.2   11900.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       52.53   13.89    2.053  0.30( 0.30) 1.00      33.3   40200.00
 LONGEST FLOWPATH FROM NODE  40200.00 TO NODE  11927.50 =    1999.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      1528.60   13.89    2.053  0.30( 0.30) 1.00     880.2   40200.00
     2      1772.54   28.13    1.321  0.30( 0.30) 1.00    1748.3   40120.00
     3      1780.35   30.00    1.266  0.30( 0.30) 1.00    1856.6   40100.00
     4      1748.21   63.41    0.864  0.30( 0.30) 1.00    3251.5   11910.00
     5      1741.08   63.90    0.862  0.30( 0.30) 1.00    3257.5   11900.00
    TOTAL AREA(ACRES) =      3257.5

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1780.35  Tc(MIN.) =   30.005
 EFFECTIVE AREA(ACRES) =   1856.61  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3257.5
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11928.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    384.00  DOWNSTREAM(FEET) =    359.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   647.19   CHANNEL SLOPE =  0.0386
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.56
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.250
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       78.01      0.30     0.984     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1813.86
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.96
 AVERAGE FLOW DEPTH(FEET) =   6.56   TRAVEL TIME(MIN.) =   0.90
 Tc(MIN.) =   30.91
 SUBAREA AREA(ACRES) =    78.01       SUBAREA RUNOFF(CFS) =   67.02
 EFFECTIVE AREA(ACRES) =   1934.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3335.5         PEAK FLOW RATE(CFS) =    1780.35
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 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.50

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.50   FLOW VELOCITY(FEET/SEC.) =  11.92
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11928.00 =   29360.61 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      1528.60   14.83    1.921  0.30( 0.30) 1.00     958.2   40200.00
     2      1772.54   29.04    1.295  0.30( 0.30) 1.00    1826.3   40120.00
     3      1780.35   30.91    1.250  0.30( 0.30) 1.00    1934.6   40100.00
     4      1748.21   64.32    0.860  0.30( 0.30) 1.00    3329.5   11910.00
     5      1741.08   64.81    0.857  0.30( 0.30) 1.00    3335.5   11900.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1780.35  Tc(MIN.) =   30.91
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1934.62

****************************************************************************
 FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    359.00  DOWNSTREAM(FEET) =    341.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1322.66   CHANNEL SLOPE =  0.0131
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.36
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.200
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       8.18      0.30     0.890     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1783.79
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.98
 AVERAGE FLOW DEPTH(FEET) =   8.36   TRAVEL TIME(MIN.) =   2.76
 Tc(MIN.) =   33.67
 SUBAREA AREA(ACRES) =     8.18       SUBAREA RUNOFF(CFS) =    6.87
 EFFECTIVE AREA(ACRES) =   1942.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3343.7         PEAK FLOW RATE(CFS) =    1780.35
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.36

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.36   FLOW VELOCITY(FEET/SEC.) =   7.97
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11929.00 =   30683.27 FEET.

 ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1528.60	17.70	1.750	0.30(0.30)	1.00	966.4	40200.00
2	1772.54	31.80	1.234	0.30(0.30)	1.00	1834.5	40120.00
3	1780.35	33.67	1.200	0.30(0.30)	1.00	1942.8	40100.00
4	1748.21	67.10	0.846	0.30(0.30)	1.00	3337.6	11910.00
5	1741.08	67.59	0.844	0.30(0.30)	1.00	3343.7	11900.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1780.35 Tc(MIN.) = 33.67
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1942.80

****
FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 10

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
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****
FLOW PROCESS FROM NODE 11841.00 TO NODE 11527.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S18.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11626.03	44.01	0.30(0.30)	1.00	7602.1	11801.00
2	12897.72	58.27	0.30(0.30)	1.00	10805.0	11530.00
3	13441.75	64.50	0.30(0.30)	1.00	12760.2	11701.00
4	13630.15	66.49	0.30(0.30)	1.00	13433.8	11000.00
5	15266.08	77.21	0.30(0.30)	1.00	18439.0	11330.00
6	15528.96	79.96	0.30(0.30)	1.00	19720.8	10800.00
7	15902.73	82.43	0.30(0.30)	1.00	21037.3	11300.00
8	16141.18	85.75	0.30(0.30)	1.00	22434.6	10630.00
9	15919.91	96.09	0.30(0.30)	1.00	25764.6	11620.00
10	15869.38	97.88	0.30(0.30)	1.00	26303.5	11600.00
11	15637.60	103.55	0.30(0.30)	1.00	27776.6	11111.00
12	15531.21	106.40	0.30(0.30)	1.00	28372.0	10500.00
13	15351.65	110.69	0.30(0.30)	1.00	29161.4	10710.00
14	15200.18	113.32	0.30(0.30)	1.00	29548.1	10410.00
15	14855.86	118.86	0.30(0.30)	1.00	30261.2	10700.00
16	14444.55	125.40	0.30(0.30)	1.00	31041.2	10400.00
17	14175.50	129.18	0.30(0.30)	1.00	31415.0	10200.00
18	13770.97	136.29	0.30(0.30)	1.00	32034.4	10320.00
19	13403.26	140.90	0.30(0.30)	1.00	32196.6	10210.00
20	11413.02	173.23	0.30(0.30)	1.00	32916.6	10100.00

TOTAL AREA(ACRES) = 32916.6

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========
MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S25.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4455.40	74.14	0.30(0.30)	0.99	6212.1	12500.00
2	4831.61	89.62	0.30(0.30)	0.99	8186.2	12300.00
3	4888.08	91.31	0.30(0.30)	0.99	8494.7	12330.00
4	4978.16	94.55	0.30(0.30)	0.98	9044.8	12410.00
5	5068.17	99.26	0.30(0.29)	0.98	9767.8	12400.00
6	5126.45	104.66	0.30(0.29)	0.98	10457.5	12211.00
7	5155.09	109.58	0.30(0.29)	0.98	11071.8	12201.00
8	5067.10	114.70	0.30(0.29)	0.98	11560.9	12111.00
9	5050.51	118.20	0.30(0.29)	0.98	11939.6	12231.00
10	5010.97	121.07	0.30(0.29)	0.98	12206.8	12101.10
11	4985.03	122.44	0.30(0.29)	0.98	12318.2	12261.00
12	4584.34	136.43	0.30(0.29)	0.98	13120.1	12010.00
13	4256.60	145.49	0.30(0.29)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 14.0

>>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4455.40	74.14	0.30(0.30)	0.99	6212.1	12500.00
2	4831.61	89.62	0.30(0.30)	0.99	8186.2	12300.00
3	4888.08	91.31	0.30(0.30)	0.99	8494.7	12330.00
4	4978.16	94.55	0.30(0.30)	0.98	9044.8	12410.00
5	5068.17	99.26	0.30(0.29)	0.98	9767.8	12400.00
6	5126.45	104.66	0.30(0.29)	0.98	10457.5	12211.00
7	5155.09	109.58	0.30(0.29)	0.98	11071.8	12201.00
8	5067.10	114.70	0.30(0.29)	0.98	11560.9	12111.00
9	5050.51	118.20	0.30(0.29)	0.98	11939.6	12231.00
10	5010.97	121.07	0.30(0.29)	0.98	12206.8	12101.10
11	4985.03	122.44	0.30(0.29)	0.98	12318.2	12261.00
12	4584.34	136.43	0.30(0.29)	0.98	13120.1	12010.00
13	4256.60	145.49	0.30(0.29)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4455.40	74.14	0.812	0.30(0.30)	0.99	6212.1	12500.00
2	4831.61	89.62	0.736	0.30(0.30)	0.99	8186.2	12300.00
3	4888.08	91.31	0.730	0.30(0.30)	0.99	8494.7	12330.00
4	4978.16	94.55	0.722	0.30(0.30)	0.98	9044.8	12410.00
5	5068.17	99.26	0.709	0.30(0.29)	0.98	9767.8	12400.00
6	5126.45	104.66	0.694	0.30(0.29)	0.98	10457.5	12211.00
7	5155.09	109.58	0.680	0.30(0.29)	0.98	11071.8	12201.00
8	5067.10	114.70	0.666	0.30(0.29)	0.98	11560.9	12111.00
9	5050.51	118.20	0.657	0.30(0.29)	0.98	11939.6	12231.00
10	5010.97	121.07	0.650	0.30(0.29)	0.98	12206.8	12101.10
11	4985.03	122.44	0.648	0.30(0.29)	0.98	12318.2	12261.00
12	4584.34	136.43	0.624	0.30(0.29)	0.98	13120.1	12010.00
13	4256.60	145.49	0.608	0.30(0.29)	0.98	13237.1	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11626.03	44.01	1.039	0.30(0.30)	1.00	7602.1	11801.00
2	12897.72	58.27	0.896	0.30(0.30)	1.00	10805.0	11530.00
3	13441.75	64.50	0.859	0.30(0.30)	1.00	12760.2	11701.00
4	13630.15	66.49	0.849	0.30(0.30)	1.00	13433.8	11000.00
5	15266.08	77.21	0.797	0.30(0.30)	1.00	18439.0	11330.00
6	15528.96	79.96	0.783	0.30(0.30)	1.00	19720.8	10800.00
7	15902.73	82.43	0.771	0.30(0.30)	1.00	21037.3	11300.00
8	16141.18	85.75	0.755	0.30(0.30)	1.00	22434.6	10630.00
9	15919.91	96.09	0.717	0.30(0.30)	1.00	25764.6	11620.00
10	15869.38	97.88	0.712	0.30(0.30)	1.00	26303.5	11600.00
11	15637.60	103.55	0.697	0.30(0.30)	1.00	27776.6	11111.00
12	15531.21	106.40	0.689	0.30(0.30)	1.00	28372.0	10500.00
13	15351.65	110.69	0.677	0.30(0.30)	1.00	29161.4	10710.00
14	15200.18	113.32	0.670	0.30(0.30)	1.00	29548.1	10410.00
15	14855.86	118.86	0.655	0.30(0.30)	1.00	30261.2	10700.00
16	14444.55	125.40	0.643	0.30(0.30)	1.00	31041.2	10400.00
17	14175.50	129.18	0.636	0.30(0.30)	1.00	31415.0	10200.00
18	13770.97	136.29	0.624	0.30(0.30)	1.00	32034.4	10320.00
19	13403.26	140.90	0.616	0.30(0.30)	1.00	32196.6	10210.00
20	11413.02	173.23	0.561	0.30(0.30)	1.00	32916.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15434.68	44.01	1.039	0.30(0.30)	0.99	11289.2	11801.00
2	16972.13	58.27	0.896	0.30(0.30)	0.99	15687.6	11530.00
3	17672.95	64.50	0.859	0.30(0.30)	0.99	18164.8	11701.00
4	17916.34	66.49	0.849	0.30(0.30)	0.99	19005.1	11000.00
5	19252.86	74.14	0.812	0.30(0.30)	0.99	23217.3	12500.00
6	19796.11	77.21	0.797	0.30(0.30)	0.99	25042.6	11330.00
7	20125.89	79.96	0.783	0.30(0.30)	0.99	26675.5	10800.00
8	20559.60	82.43	0.771	0.30(0.30)	0.99	28306.5	11300.00
9	20878.73	85.75	0.755	0.30(0.30)	0.99	30127.2	10630.00
10	20889.99	89.62	0.736	0.30(0.30)	0.99	31866.9	12300.00
11	20910.20	91.31	0.730	0.30(0.30)	0.99	32721.0	12330.00
12	20931.11	94.55	0.722	0.30(0.30)	0.99	34312.2	12410.00

13	20927.53	96.09	0.717	0.30(0.30)	0.99	35046.0	11620.00
14	20911.20	97.88	0.712	0.30(0.30)	0.99	35859.7	11600.00
15	20881.09	99.26	0.709	0.30(0.30)	0.99	36430.1	12400.00
16	20752.05	103.55	0.697	0.30(0.30)	0.99	38092.1	11111.00
17	20722.50	104.66	0.694	0.30(0.30)	0.99	38466.7	12211.00
18	20667.78	106.40	0.689	0.30(0.30)	0.99	39046.6	10500.00
19	20553.34	109.58	0.680	0.30(0.30)	0.99	40028.3	12201.00
20	20487.62	110.69	0.677	0.30(0.30)	0.99	40339.5	10710.00
21	20290.96	113.32	0.670	0.30(0.30)	0.99	40977.4	10410.00
22	20181.49	114.70	0.666	0.30(0.30)	0.99	41286.7	12111.00
23	19947.30	118.20	0.657	0.30(0.30)	0.99	42116.0	12231.00
24	19897.31	118.86	0.655	0.30(0.30)	0.99	42262.0	10700.00
25	19727.68	121.07	0.650	0.30(0.30)	0.99	42731.9	12101.10
26	19616.04	122.44	0.648	0.30(0.30)	0.99	43005.8	12261.00
27	19344.67	125.40	0.643	0.30(0.30)	0.99	43529.4	10400.00
28	18967.53	129.18	0.636	0.30(0.30)	0.99	44119.4	10200.00
29	18359.27	136.29	0.624	0.30(0.30)	0.99	45146.6	10320.00
30	18344.26	136.43	0.624	0.30(0.30)	0.99	45159.4	12010.00
31	17825.82	140.90	0.616	0.30(0.30)	0.99	45374.4	10210.00
32	17377.40	145.49	0.608	0.30(0.30)	0.99	45535.9	12000.00
33	15025.29	173.23	0.561	0.30(0.30)	0.99	46153.7	10100.00

TOTAL AREA(ACRES) = 46153.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 20931.11 Tc(MIN.) = 94.547
EFFECTIVE AREA(ACRES) = 34312.20 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46153.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

****
FLOW PROCESS FROM NODE 12527.00 TO NODE 11929.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 347.47 DOWNSTREAM(FEET) = 341.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 532.38 CHANNEL SLOPE = 0.0110
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.93
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.720
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.37	0.30	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20933.85
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.87
AVERAGE FLOW DEPTH(FEET) = 6.93 TRAVEL TIME(MIN.) = 0.69
Tc(MIN.) = 95.24
SUBAREA AREA(ACRES) = 14.37 SUBAREA RUNOFF(CFS) = 5.48
EFFECTIVE AREA(ACRES) = 34326.57 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46168.0 PEAK FLOW RATE(CFS) = 20931.11
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.93 FLOW VELOCITY(FEET/SEC.) = 12.87
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15434.68	44.77	1.030	0.30(0.30)	0.99	11303.6	11801.00
2	16972.13	59.01	0.890	0.30(0.30)	0.99	15702.0	11530.00
3	17672.95	65.23	0.855	0.30(0.30)	0.99	18179.2	11701.00
4	17916.34	67.22	0.846	0.30(0.30)	0.99	19019.5	11000.00
5	19252.86	74.85	0.808	0.30(0.30)	0.99	23231.6	12500.00
6	19796.11	77.91	0.793	0.30(0.30)	0.99	25057.0	11330.00
7	20125.89	80.66	0.780	0.30(0.30)	0.99	26689.9	10800.00
8	20559.60	83.12	0.768	0.30(0.30)	0.99	28320.9	11300.00
9	20878.73	86.44	0.751	0.30(0.30)	0.99	30141.6	10630.00
10	20889.99	90.31	0.733	0.30(0.30)	0.99	31881.3	12300.00
11	20910.20	92.00	0.729	0.30(0.30)	0.99	32735.4	12330.00
12	20931.11	95.24	0.720	0.30(0.30)	0.99	34326.6	12410.00
13	20927.53	96.78	0.715	0.30(0.30)	0.99	35060.4	11620.00
14	20911.20	98.57	0.711	0.30(0.30)	0.99	35874.0	11600.00
15	20881.09	99.95	0.707	0.30(0.30)	0.99	36444.5	12400.00
16	20752.05	104.24	0.695	0.30(0.30)	0.99	38106.5	11111.00
17	20722.50	105.36	0.692	0.30(0.30)	0.99	38481.0	12211.00
18	20667.78	107.09	0.687	0.30(0.30)	0.99	39061.0	10500.00
19	20553.34	110.27	0.679	0.30(0.30)	0.99	40042.7	12201.00
20	20487.62	111.39	0.676	0.30(0.30)	0.99	40353.8	10710.00
21	20290.96	114.02	0.668	0.30(0.30)	0.99	40991.7	10410.00
22	20181.49	115.40	0.665	0.30(0.30)	0.99	41301.0	12111.00
23	19947.30	118.90	0.655	0.30(0.30)	0.99	42130.4	12231.00
24	19897.31	119.56	0.653	0.30(0.30)	0.99	42276.4	10700.00
25	19727.68	121.78	0.649	0.30(0.30)	0.99	42746.2	12101.10
26	19616.04	123.14	0.647	0.30(0.30)	0.99	43020.2	12261.00
27	19344.67	126.11	0.642	0.30(0.30)	0.99	43543.7	10400.00
28	18967.53	129.89	0.635	0.30(0.30)	0.99	44133.8	10200.00
29	18359.27	137.01	0.623	0.30(0.30)	0.99	45160.9	10320.00
30	18344.26	137.15	0.623	0.30(0.30)	0.99	45173.7	12010.00
31	17825.82	141.63	0.615	0.30(0.30)	0.99	45388.8	10210.00
32	17377.40	146.23	0.607	0.30(0.30)	0.99	45550.3	12000.00
33	15025.29	174.00	0.559	0.30(0.30)	0.99	46168.0	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 20931.11 Tc(MIN.) = 95.24
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34326.57

****
FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15434.68	44.77	1.030	0.30(0.30)	0.99	11303.6	11801.00

2	16972.13	59.01	0.890	0.30(0.30)	0.99	15702.0	11530.00
3	17672.95	65.23	0.855	0.30(0.30)	0.99	18179.2	11701.00
4	17916.34	67.22	0.846	0.30(0.30)	0.99	19019.5	11000.00
5	19252.86	74.85	0.808	0.30(0.30)	0.99	23231.6	12500.00
6	19796.11	77.91	0.793	0.30(0.30)	0.99	25057.0	11330.00
7	20125.89	80.66	0.780	0.30(0.30)	0.99	26689.9	10800.00
8	20559.60	83.12	0.768	0.30(0.30)	0.99	28320.9	11300.00
9	20878.73	86.44	0.751	0.30(0.30)	0.99	30141.6	10630.00
10	20889.99	90.31	0.733	0.30(0.30)	0.99	31881.3	12300.00
11	20910.20	92.00	0.729	0.30(0.30)	0.99	32735.4	12330.00
12	20931.11	95.24	0.720	0.30(0.30)	0.99	34326.6	12410.00
13	20927.53	96.78	0.715	0.30(0.30)	0.99	35060.4	11620.00
14	20911.20	98.57	0.711	0.30(0.30)	0.99	35874.0	11600.00
15	20881.09	99.95	0.707	0.30(0.30)	0.99	36444.5	12400.00
16	20752.05	104.24	0.695	0.30(0.30)	0.99	38106.5	11111.00
17	20722.50	105.36	0.692	0.30(0.30)	0.99	38481.0	12211.00
18	20667.78	107.09	0.687	0.30(0.30)	0.99	39061.0	10500.00
19	20553.34	110.27	0.679	0.30(0.30)	0.99	40042.7	12201.00
20	20487.62	111.39	0.676	0.30(0.30)	0.99	40353.8	10710.00
21	20290.96	114.02	0.668	0.30(0.30)	0.99	40991.7	10410.00
22	20181.49	115.40	0.665	0.30(0.30)	0.99	41301.0	12111.00
23	19947.30	118.90	0.655	0.30(0.30)	0.99	42130.4	12231.00
24	19897.31	119.56	0.653	0.30(0.30)	0.99	42276.4	10700.00
25	19727.68	121.78	0.649	0.30(0.30)	0.99	42746.2	12101.10
26	19616.04	123.14	0.647	0.30(0.30)	0.99	43020.2	12261.00
27	19344.67	126.11	0.642	0.30(0.30)	0.99	43543.7	10400.00
28	18967.53	129.89	0.635	0.30(0.30)	0.99	44133.8	10200.00
29	18359.27	137.01	0.623	0.30(0.30)	0.99	45160.9	10320.00
30	18344.26	137.15	0.623	0.30(0.30)	0.99	45173.7	12010.00
31	17825.82	141.63	0.615	0.30(0.30)	0.99	45388.8	10210.00
32	17377.40	146.23	0.607	0.30(0.30)	0.99	45550.3	12000.00
33	15025.29	174.00	0.559	0.30(0.30)	0.99	46168.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1528.60	17.70	1.750	0.30(0.30)	1.00	966.4	40200.00
2	1772.54	31.80	1.234	0.30(0.30)	1.00	1834.5	40120.00
3	1780.35	33.67	1.200	0.30(0.30)	1.00	1942.8	40100.00
4	1748.21	67.10	0.846	0.30(0.30)	1.00	3337.6	11910.00
5	1741.08	67.59	0.844	0.30(0.30)	1.00	3343.7	11900.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13630.81	17.70	1.750	0.30(0.30)	0.99	5434.4	40200.00
2	15789.33	31.80	1.234	0.30(0.30)	0.99	9863.5	40120.00
3	16087.43	33.67	1.200	0.30(0.30)	0.99	10443.5	40100.00
4	17204.36	44.77	1.030	0.30(0.30)	0.99	13709.7	11801.00
5	18728.11	59.01	0.890	0.30(0.30)	0.99	18702.4	11530.00
6	19422.95	65.23	0.855	0.30(0.30)	0.99	21439.1	11701.00
7	19649.26	67.10	0.846	0.30(0.30)	0.99	22304.3	11910.00
8	19662.75	67.22	0.846	0.30(0.30)	0.99	22358.7	11000.00
9	19722.25	67.59	0.844	0.30(0.30)	0.99	22567.5	11900.00
10	20880.24	74.85	0.808	0.30(0.30)	0.99	26575.4	12500.00
11	21375.51	77.91	0.793	0.30(0.30)	0.99	28400.7	11330.00

12	21662.25	80.66	0.780	0.30(0.30)	0.99	30033.6	10800.00
13	22057.42	83.12	0.768	0.30(0.30)	0.99	31664.6	11300.00
14	22324.62	86.44	0.751	0.30(0.30)	0.99	33485.3	10630.00
15	22277.42	90.31	0.733	0.30(0.30)	0.99	35225.0	12300.00
16	22282.83	92.00	0.729	0.30(0.30)	0.99	36079.1	12330.00
17	22275.50	95.24	0.720	0.30(0.30)	0.99	37670.3	12410.00
18	22258.43	96.78	0.715	0.30(0.30)	0.99	38404.1	11620.00
19	22226.44	98.57	0.711	0.30(0.30)	0.99	39217.8	11600.00
20	22184.26	99.95	0.707	0.30(0.30)	0.99	39788.2	12400.00
21	22017.75	104.24	0.695	0.30(0.30)	0.99	41450.2	11111.00
22	21978.49	105.36	0.692	0.30(0.30)	0.99	41824.8	12211.00
23	21908.59	107.09	0.687	0.30(0.30)	0.99	42404.7	10500.00
24	21766.39	110.27	0.679	0.30(0.30)	0.99	43386.4	12201.00
25	21690.94	111.39	0.676	0.30(0.30)	0.99	43697.5	10710.00
26	21471.26	114.02	0.668	0.30(0.30)	0.99	44335.4	10410.00
27	21349.72	115.40	0.665	0.30(0.30)	0.99	44644.8	12111.00
28	21084.93	118.90	0.655	0.30(0.30)	0.99	45474.1	12231.00
29	21029.19	119.56	0.653	0.30(0.30)	0.99	45620.1	10700.00
30	20845.98	121.78	0.649	0.30(0.30)	0.99	46090.0	12101.10
31	20726.86	123.14	0.647	0.30(0.30)	0.99	46363.9	12261.00
32	20439.20	126.11	0.642	0.30(0.30)	0.99	46887.5	10400.00
33	20041.32	129.89	0.635	0.30(0.30)	0.99	47477.5	10200.00
34	19393.98	137.01	0.623	0.30(0.30)	0.99	48504.6	10320.00
35	19378.21	137.15	0.623	0.30(0.30)	0.99	48517.4	12010.00
36	18835.20	141.63	0.615	0.30(0.30)	0.99	48732.5	10210.00
37	18361.57	146.23	0.607	0.30(0.30)	0.99	48894.0	12000.00
38	15857.08	174.00	0.559	0.30(0.30)	0.99	49511.8	10100.00

TOTAL AREA(ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 22324.62 Tc(MIN.) = 86.440
EFFECTIVE AREA(ACRES) = 33485.30 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49511.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 49511.8 TC(MIN.) = 86.44
EFFECTIVE AREA(ACRES) = 33485.30 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994
PEAK FLOW RATE(CFS) = 22324.62

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13630.81	17.70	1.750	0.30(0.30)	0.99	5434.4	40200.00
2	15789.33	31.80	1.234	0.30(0.30)	0.99	9863.5	40120.00
3	16087.43	33.67	1.200	0.30(0.30)	0.99	10443.5	40100.00
4	17204.36	44.77	1.030	0.30(0.30)	0.99	13709.7	11801.00
5	18728.11	59.01	0.890	0.30(0.30)	0.99	18702.4	11530.00
6	19422.95	65.23	0.855	0.30(0.30)	0.99	21439.1	11701.00
7	19649.26	67.10	0.846	0.30(0.30)	0.99	22304.3	11910.00
8	19662.75	67.22	0.846	0.30(0.30)	0.99	22358.7	11000.00
9	19722.25	67.59	0.844	0.30(0.30)	0.99	22567.5	11900.00
10	20880.24	74.85	0.808	0.30(0.30)	0.99	26575.4	12500.00
11	21375.51	77.91	0.793	0.30(0.30)	0.99	28400.7	11330.00
12	21662.25	80.66	0.780	0.30(0.30)	0.99	30033.6	10800.00
13	22057.42	83.12	0.768	0.30(0.30)	0.99	31664.6	11300.00

14	22324.62	86.44	0.751	0.30(0.30)	0.99	33485.3	10630.00
15	22277.42	90.31	0.733	0.30(0.30)	0.99	35225.0	12300.00
16	22282.83	92.00	0.729	0.30(0.30)	0.99	36079.1	12330.00
17	22275.50	95.24	0.720	0.30(0.30)	0.99	37670.3	12410.00
18	22258.43	96.78	0.715	0.30(0.30)	0.99	38404.1	11620.00
19	22226.44	98.57	0.711	0.30(0.30)	0.99	39217.8	11600.00
20	22184.26	99.95	0.707	0.30(0.30)	0.99	39788.2	12400.00
21	22017.75	104.24	0.695	0.30(0.30)	0.99	41450.2	11111.00
22	21978.49	105.36	0.692	0.30(0.30)	0.99	41824.8	12211.00
23	21908.59	107.09	0.687	0.30(0.30)	0.99	42404.7	10500.00
24	21766.39	110.27	0.679	0.30(0.30)	0.99	43386.4	12201.00
25	21690.94	111.39	0.676	0.30(0.30)	0.99	43697.5	10710.00
26	21471.26	114.02	0.668	0.30(0.30)	0.99	44335.4	10410.00
27	21349.72	115.40	0.665	0.30(0.30)	0.99	44644.8	12111.00
28	21084.93	118.90	0.655	0.30(0.30)	0.99	45474.1	12231.00
29	21029.19	119.56	0.653	0.30(0.30)	0.99	45620.1	10700.00
30	20845.98	121.78	0.649	0.30(0.30)	0.99	46090.0	12101.10
31	20726.86	123.14	0.647	0.30(0.30)	0.99	46363.9	12261.00
32	20439.20	126.11	0.642	0.30(0.30)	0.99	46887.5	10400.00
33	20041.32	129.89	0.635	0.30(0.30)	0.99	47477.5	10200.00
34	19393.98	137.01	0.623	0.30(0.30)	0.99	48504.6	10320.00
35	19378.21	137.15	0.623	0.30(0.30)	0.99	48517.4	12010.00
36	18835.20	141.63	0.615	0.30(0.30)	0.99	48732.5	10210.00
37	18361.57	146.23	0.607	0.30(0.30)	0.99	48894.0	12000.00
38	15857.08	174.00	0.559	0.30(0.30)	0.99	49511.8	10100.00

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END OF RATIONAL METHOD ANALYSIS

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             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S20.DAT
  TIME/DATE OF STUDY: 13:50 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.576
   2)   10.00;  2.408
   3)   15.00;  1.819
   4)   20.00;  1.553
   5)   25.00;  1.360
   6)   30.00;  1.229
   7)   40.00;  1.044
   8)   50.00;  0.927
   9)   60.00;  0.837
  10)   90.00;  0.688
  11)  120.00;  0.601
  12)  180.00;  0.500
  13)  360.00;  0.362
  14) 1440.00;  0.157
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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**************************************************************************
  FLOW PROCESS FROM NODE  12000.00 TO NODE  12001.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   965.01
  ELEVATION DATA: UPSTREAM(FEET) =   4506.20  DOWNSTREAM(FEET) =   4179.61

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.700
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.972
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        9.03      0.30     1.000     0   13.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.59
  TOTAL AREA(ACRES) =      9.03   PEAK FLOW RATE(CFS) =     13.59

**************************************************************************
  FLOW PROCESS FROM NODE  12001.00 TO NODE  12002.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4179.61  DOWNSTREAM(FEET) =   3849.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.60   CHANNEL SLOPE =  0.3380
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.762
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.86
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   2.37
  Tc(MIN.) =   16.07
  SUBAREA AREA(ACRES) =    18.82       SUBAREA RUNOFF(CFS) =   24.76
  EFFECTIVE AREA(ACRES) =     27.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.8          PEAK FLOW RATE(CFS) =      36.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   7.81
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12002.00 =    1941.61 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12002.00 TO NODE  12003.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3849.51  DOWNSTREAM(FEET) =   3265.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1892.03   CHANNEL SLOPE =  0.3086
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.591
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.79
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =   19.29
  SUBAREA AREA(ACRES) =    68.96       SUBAREA RUNOFF(CFS) =   80.11
  EFFECTIVE AREA(ACRES) =     96.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       96.8         PEAK FLOW RATE(CFS) =     112.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =  11.17
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12003.00 =    3833.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3265.69  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3118.62   CHANNEL SLOPE =  0.2688
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.58
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.440
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     281.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.27
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   3.64
  Tc(MIN.) =   22.94
  SUBAREA AREA(ACRES) =   328.28       SUBAREA RUNOFF(CFS) =  336.75
  EFFECTIVE AREA(ACRES) =    425.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      425.1         PEAK FLOW RATE(CFS) =     436.06
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =  16.33
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.94
  RAINFALL INTENSITY(INCH/HR) =   1.44
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     425.09
  TOTAL STREAM AREA(ACRES) =     425.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     436.06

****************************************************************************
  FLOW PROCESS FROM NODE  12010.00 TO NODE  12011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   264.80
  ELEVATION DATA: UPSTREAM(FEET) =   4208.12  DOWNSTREAM(FEET) =   4068.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.470
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.999
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.06      0.30     1.000     0    7.47
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.00
  TOTAL AREA(ACRES) =      2.06   PEAK FLOW RATE(CFS) =      5.00

****************************************************************************
  FLOW PROCESS FROM NODE  12011.00 TO NODE  12012.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4068.13  DOWNSTREAM(FEET) =   3694.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.45   CHANNEL SLOPE =  0.5703
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.17
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.523
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        3.98      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.36
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   2.04
  Tc(MIN.) =    9.51
  SUBAREA AREA(ACRES) =     3.98       SUBAREA RUNOFF(CFS) =    7.96
  EFFECTIVE AREA(ACRES) =      6.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      12.09
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.19   FLOW VELOCITY(FEET/SEC.) =   6.01
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12012.00 =     919.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12012.00 TO NODE  12013.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3694.92  DOWNSTREAM(FEET) =   3415.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   981.94   CHANNEL SLOPE =  0.2845
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.53
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.219
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       35.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.80
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   2.10
  Tc(MIN.) =   11.61
  SUBAREA AREA(ACRES) =    35.56       SUBAREA RUNOFF(CFS) =   61.41
  EFFECTIVE AREA(ACRES) =     41.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.6         PEAK FLOW RATE(CFS) =      71.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   9.27
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12013.00 =    1901.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12013.00 TO NODE  12014.00 IS CODE =  56
```



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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3415.55  DOWNSTREAM(FEET) =   2756.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.68   CHANNEL SLOPE =  0.3420
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.901
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       72.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     124.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.89
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   14.31
  SUBAREA AREA(ACRES) =    72.40       SUBAREA RUNOFF(CFS) =  104.30
  EFFECTIVE AREA(ACRES) =    114.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.0         PEAK FLOW RATE(CFS) =     164.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =  13.07
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12014.00 =    3827.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2756.62  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1697.28   CHANNEL SLOPE =  0.1940
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.56
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.733
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      121.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     242.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.23
  AVERAGE FLOW DEPTH(FEET) =   1.52   TRAVEL TIME(MIN.) =   2.31
  Tc(MIN.) =   16.62
  SUBAREA AREA(ACRES) =   121.96       SUBAREA RUNOFF(CFS) =  157.27
  EFFECTIVE AREA(ACRES) =    235.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      236.0         PEAK FLOW RATE(CFS) =     304.28
```

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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.73   FLOW VELOCITY(FEET/SEC.) =  13.08
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12020.00 =    5525.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.62
  RAINFALL INTENSITY(INCH/HR) =   1.73
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     235.96
  TOTAL STREAM AREA(ACRES) =     235.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     304.28

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      436.06   22.94    1.440  0.30( 0.30) 1.00     425.1   12000.00
      2      304.28   16.62    1.733  0.30( 0.30) 1.00     236.0   12010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      701.54   16.62    1.733  0.30( 0.30) 1.00     544.0   12010.00
      2      678.10   22.94    1.440  0.30( 0.30) 1.00     661.0   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     701.54    Tc(MIN.) =    16.62
  EFFECTIVE AREA(ACRES) =     544.02   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      661.0
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12020.00 TO NODE  12021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2427.28  DOWNSTREAM(FEET) =   2056.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2698.04   CHANNEL SLOPE =  0.1375
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.47
```



```
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.582
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      376.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     918.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.90
  AVERAGE FLOW DEPTH(FEET) =   3.43   TRAVEL TIME(MIN.) =   2.83
  Tc(MIN.) =   19.45
  SUBAREA AREA(ACRES) =   376.13       SUBAREA RUNOFF(CFS) =  434.10
  EFFECTIVE AREA(ACRES) =    920.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1037.2          PEAK FLOW RATE(CFS) =    1061.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.69   FLOW VELOCITY(FEET/SEC.) =  16.56
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12021.00 =    9650.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12021.00 TO NODE  12022.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2056.25  DOWNSTREAM(FEET) =   1864.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2552.86   CHANNEL SLOPE =  0.0750
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.69
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.456
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      347.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1242.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.84
  AVERAGE FLOW DEPTH(FEET) =   4.65   TRAVEL TIME(MIN.) =   3.07
  Tc(MIN.) =   22.52
  SUBAREA AREA(ACRES) =   347.45       SUBAREA RUNOFF(CFS) =  361.39
  EFFECTIVE AREA(ACRES) =   1267.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1384.6          PEAK FLOW RATE(CFS) =    1318.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.79   FLOW VELOCITY(FEET/SEC.) =  14.06
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12022.00 =   12203.16 FEET.

****************************************************************************
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```
 FLOW PROCESS FROM NODE  12022.00 TO NODE  12023.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1864.68  DOWNSTREAM(FEET) =   1710.75
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.57   CHANNEL SLOPE =  0.0816
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.94
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.374
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      280.70      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1454.15
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.88
 AVERAGE FLOW DEPTH(FEET) =   4.92   TRAVEL TIME(MIN.) =   2.11
 Tc(MIN.) =   24.64
 SUBAREA AREA(ACRES) =   280.70       SUBAREA RUNOFF(CFS) =  271.35
 EFFECTIVE AREA(ACRES) =   1548.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1665.3         PEAK FLOW RATE(CFS) =    1496.75
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.99

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.99   FLOW VELOCITY(FEET/SEC.) =  15.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12023.00 =   14089.73 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1710.75  DOWNSTREAM(FEET) =   1672.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.87   CHANNEL SLOPE =  0.0196
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.28
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.275
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      248.35      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1605.78
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.02
 AVERAGE FLOW DEPTH(FEET) =   7.26   TRAVEL TIME(MIN.) =   3.59
 Tc(MIN.) =   28.23
 SUBAREA AREA(ACRES) =   248.35       SUBAREA RUNOFF(CFS) =  218.03
 EFFECTIVE AREA(ACRES) =   1796.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1913.7         PEAK FLOW RATE(CFS) =    1577.29
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.20

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.20   FLOW VELOCITY(FEET/SEC.) =   8.98
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12024.00 =   16034.60 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1913.7  TC(MIN.) =     28.23
 EFFECTIVE AREA(ACRES) =   1796.65  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =    1577.29

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1577.29   28.23    1.275  0.30( 0.30) 1.00    1796.6   12010.00
     2     1445.99   34.84    1.139  0.30( 0.30) 1.00    1913.7   12000.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




------------------------------------------------------------------------------
  FILE NAME: S21.DAT
  TIME/DATE OF STUDY: 13:50 04/03/2013
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.576
   2)   10.00;  2.408
   3)   15.00;  1.819
   4)   20.00;  1.553
   5)   25.00;  1.360
   6)   30.00;  1.229
   7)   40.00;  1.044
   8)   50.00;  0.927
   9)   60.00;  0.837
  10)   90.00;  0.688
  11)  120.00;  0.601
  12)  180.00;  0.500
  13)  360.00;  0.362
  14) 1440.00;  0.157
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
******************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 15.1
------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S20.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1     1577.29   28.23  0.30( 0.30) 1.00    1796.6   12010.00
      2     1445.99   34.84  0.30( 0.30) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =     1913.7

******************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 14.0
------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1     1577.29   28.23  0.30( 0.30) 1.00    1796.6   12010.00
      2     1445.99   34.84  0.30( 0.30) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =      1913.7

******************************************************************************
  FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1672.60  DOWNSTREAM(FEET) =   1636.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   780.49   CHANNEL SLOPE =  0.0458
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.96
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.248
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       93.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1617.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.37
  AVERAGE FLOW DEPTH(FEET) =   5.96   TRAVEL TIME(MIN.) =   1.05
  Tc(MIN.) =   29.28
  SUBAREA AREA(ACRES) =    93.19       SUBAREA RUNOFF(CFS) =   79.50
  EFFECTIVE AREA(ACRES) =   1889.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.9         PEAK FLOW RATE(CFS) =    1612.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.95   FLOW VELOCITY(FEET/SEC.) =  12.36
```

```
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.28
  RAINFALL INTENSITY(INCH/HR) =   1.25
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1889.84
  TOTAL STREAM AREA(ACRES) =    2006.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1612.25

****************************************************************************
  FLOW PROCESS FROM NODE  12101.10 TO NODE  12101.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   847.57
  ELEVATION DATA: UPSTREAM(FEET) =   3435.00  DOWNSTREAM(FEET) =   2774.23

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.008
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.289
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        6.56      0.30     1.000     0   11.01
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.75
  TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =     11.75

****************************************************************************
  FLOW PROCESS FROM NODE  12101.20 TO NODE  12101.30 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2774.23  DOWNSTREAM(FEET) =   2097.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1205.19   CHANNEL SLOPE =  0.5619
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.41
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.038
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.41
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   2.14
  Tc(MIN.) =   13.14
  SUBAREA AREA(ACRES) =    34.88       SUBAREA RUNOFF(CFS) =   54.55
  EFFECTIVE AREA(ACRES) =     41.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.4          PEAK FLOW RATE(CFS) =      64.81
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =  11.21
  LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12101.30 =    2052.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2097.09  DOWNSTREAM(FEET) =   1636.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1553.74   CHANNEL SLOPE =  0.2962
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.788
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     102.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.65
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   15.57
  SUBAREA AREA(ACRES) =    56.40       SUBAREA RUNOFF(CFS) =   75.56
  EFFECTIVE AREA(ACRES) =     97.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.8          PEAK FLOW RATE(CFS) =     131.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =  11.58
  LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12102.00 =    3606.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =   15.57
 RAINFALL INTENSITY(INCH/HR) =   1.79
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =      97.84
 TOTAL STREAM AREA(ACRES) =      97.84
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     131.08

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1612.25   29.28    1.248  0.30( 0.30) 1.00    1889.8   12010.00
     1     1480.48   35.91    1.120  0.30( 0.30) 1.00    2006.9   12000.00
     2      131.08   15.57    1.788  0.30( 0.30) 1.00      97.8   12101.10

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1477.66   15.57    1.788  0.30( 0.30) 1.00    1103.0   12101.10
     2     1695.72   29.28    1.248  0.30( 0.30) 1.00    1987.7   12010.00
     3     1552.66   35.91    1.120  0.30( 0.30) 1.00    2104.7   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1695.72    Tc(MIN.) =    29.28
 EFFECTIVE AREA(ACRES) =    1987.68   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     2104.7
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12102.00 TO NODE  12103.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1636.82  DOWNSTREAM(FEET) =   1558.46
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2049.75   CHANNEL SLOPE =  0.0382
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.46
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.189
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      116.59      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1742.35
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.80
 AVERAGE FLOW DEPTH(FEET) =   6.45   TRAVEL TIME(MIN.) =   2.90
 Tc(MIN.) =   32.18
 SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =   93.26
 EFFECTIVE AREA(ACRES) =   2104.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     2221.3         PEAK FLOW RATE(CFS) =    1695.72
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.37

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.37   FLOW VELOCITY(FEET/SEC.) =  11.71
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12103.00 =   18864.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12103.00 TO NODE  12104.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1558.46  DOWNSTREAM(FEET) =   1453.87
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1971.34   CHANNEL SLOPE =  0.0531
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.12
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.144
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      355.30      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1830.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.49
 AVERAGE FLOW DEPTH(FEET) =   6.11   TRAVEL TIME(MIN.) =   2.44
 Tc(MIN.) =   34.61
 SUBAREA AREA(ACRES) =   355.30       SUBAREA RUNOFF(CFS) =  269.80
 EFFECTIVE AREA(ACRES) =   2459.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2576.6         PEAK FLOW RATE(CFS) =    1867.71
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.17

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.17   FLOW VELOCITY(FEET/SEC.) =  13.56
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12104.00 =   20836.18 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12104.00 TO NODE  12105.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1453.87  DOWNSTREAM(FEET) =   1369.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1885.63   CHANNEL SLOPE =  0.0446
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.55
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.098
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      200.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1939.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.85
  AVERAGE FLOW DEPTH(FEET) =   6.54   TRAVEL TIME(MIN.) =   2.45
  Tc(MIN.) =   37.06
  SUBAREA AREA(ACRES) =   200.37       SUBAREA RUNOFF(CFS) =  143.99
  EFFECTIVE AREA(ACRES) =   2659.94     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2777.0         PEAK FLOW RATE(CFS) =    1911.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.50   FLOW VELOCITY(FEET/SEC.) =  12.79
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12105.00 =   22721.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12105.00 TO NODE  12106.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1369.72  DOWNSTREAM(FEET) =   1298.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1910.12   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.97
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.050
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      339.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2026.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.17
  AVERAGE FLOW DEPTH(FEET) =   6.96   TRAVEL TIME(MIN.) =   2.62
  Tc(MIN.) =   39.68
  SUBAREA AREA(ACRES) =   339.52       SUBAREA RUNOFF(CFS) =  229.20
  EFFECTIVE AREA(ACRES) =   2999.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3116.5         PEAK FLOW RATE(CFS) =    2024.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.96   FLOW VELOCITY(FEET/SEC.) =  12.16
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12106.00 =   24631.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1298.29  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2982.44   CHANNEL SLOPE =  0.0277
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.56
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.995
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      164.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2076.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.96
  AVERAGE FLOW DEPTH(FEET) =   7.55   TRAVEL TIME(MIN.) =   4.54
  Tc(MIN.) =   44.21
  SUBAREA AREA(ACRES) =   164.97       SUBAREA RUNOFF(CFS) =  103.16
  EFFECTIVE AREA(ACRES) =   3164.43     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3281.5         PEAK FLOW RATE(CFS) =    2024.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.46   FLOW VELOCITY(FEET/SEC.) =  10.88
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   44.21
  RAINFALL INTENSITY(INCH/HR) =   0.99
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3164.43
  TOTAL STREAM AREA(ACRES) =    3281.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2024.84

****************************************************************************
  FLOW PROCESS FROM NODE  12111.00 TO NODE  12112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   939.51
  ELEVATION DATA: UPSTREAM(FEET) =   3108.05  DOWNSTREAM(FEET) =   2753.95

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.265
```

```
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.023
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,BROADLEAF"       -        8.25      0.30     1.000     0   13.27
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     12.80
 TOTAL AREA(ACRES) =      8.25   PEAK FLOW RATE(CFS) =     12.80

****************************************************************************
 FLOW PROCESS FROM NODE  12112.00 TO NODE  12113.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2753.95  DOWNSTREAM(FEET) =   2458.45
 CHANNEL LENGTH THRU SUBAREA(FEET) =   945.14   CHANNEL SLOPE =  0.3127
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.781
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       16.51      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.83
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.44
 AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   2.45
 Tc(MIN.) =   15.71
 SUBAREA AREA(ACRES) =    16.51       SUBAREA RUNOFF(CFS) =   22.01
 EFFECTIVE AREA(ACRES) =     24.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       24.8         PEAK FLOW RATE(CFS) =      33.01
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.42

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   7.31
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12113.00 =    1884.65 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12113.00 TO NODE  12114.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2458.45  DOWNSTREAM(FEET) =   1823.37
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.76   CHANNEL SLOPE =  0.3336
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.605
 SUBAREA LOSS RATE DATA(AMC  II):
```



```
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       57.98      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      67.17
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.59
 AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   3.31
 Tc(MIN.) =   19.02
 SUBAREA AREA(ACRES) =    57.98       SUBAREA RUNOFF(CFS) =   68.11
 EFFECTIVE AREA(ACRES) =     82.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       82.7         PEAK FLOW RATE(CFS) =      97.19
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.77

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =  10.88
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12114.00 =    3788.41 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12114.00 TO NODE  12115.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1823.37  DOWNSTREAM(FEET) =   1500.53
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.04   CHANNEL SLOPE =  0.1916
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.490
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -      124.07      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     163.68
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.73
 AVERAGE FLOW DEPTH(FEET) =   1.23   TRAVEL TIME(MIN.) =   2.62
 Tc(MIN.) =   21.64
 SUBAREA AREA(ACRES) =   124.07       SUBAREA RUNOFF(CFS) =  132.86
 EFFECTIVE AREA(ACRES) =    206.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      206.8         PEAK FLOW RATE(CFS) =     221.46
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.45

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =  11.82
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12115.00 =    5473.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =  56
----------------------------------------------------------------------------
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```
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1500.53  DOWNSTREAM(FEET) =   1215.72
CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.45   CHANNEL SLOPE =  0.1519
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   1.68
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.383
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -       62.55      0.30     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     251.97
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.34
AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   2.76
Tc(MIN.) =   24.39
SUBAREA AREA(ACRES) =    62.55       SUBAREA RUNOFF(CFS) =   60.99
EFFECTIVE AREA(ACRES) =    269.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =      269.4         PEAK FLOW RATE(CFS) =     262.65
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   1.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =  11.48
LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12121.00 =    7348.90 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   24.39
RAINFALL INTENSITY(INCH/HR) =   1.38
AREA-AVERAGED Fm(INCH/HR) =  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30
AREA-AVERAGED Ap =  1.00
EFFECTIVE STREAM AREA(ACRES) =     269.36
TOTAL STREAM AREA(ACRES) =     269.36
PEAK FLOW RATE(CFS) AT CONFLUENCE =     262.65

** CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1958.48   30.75    1.215  0.30( 0.30) 1.00    2279.7   12101.10
    1     2024.84   44.21    0.995  0.30( 0.30) 1.00    3164.4   12010.00
    1     1871.64   51.19    0.916  0.30( 0.30) 1.00    3281.5   12000.00
    2      262.65   24.39    1.383  0.30( 0.30) 1.00     269.4   12111.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.
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** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     2101.92   24.39    1.383  0.30( 0.30) 1.00    2077.8   12111.00
    2     2180.33   30.75    1.215  0.30( 0.30) 1.00    2549.1   12101.10
    3     2193.28   44.21    0.995  0.30( 0.30) 1.00    3433.8   12010.00
    4     2021.06   51.19    0.916  0.30( 0.30) 1.00    3550.8   12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    2193.28    Tc(MIN.) =    44.21
EFFECTIVE AREA(ACRES) =    3433.79   AREA-AVERAGED Fm(INCH/HR) =  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
TOTAL AREA(ACRES) =     3550.8
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12121.00 TO NODE  12241.00 IS CODE =  56
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1215.72  DOWNSTREAM(FEET) =   1122.29
CHANNEL LENGTH THRU SUBAREA(FEET) =  3397.13   CHANNEL SLOPE =  0.0275
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   7.83
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.935
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -      136.41      0.30     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2232.27
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.13
AVERAGE FLOW DEPTH(FEET) =   7.82   TRAVEL TIME(MIN.) =   5.09
Tc(MIN.) =   49.30
SUBAREA AREA(ACRES) =   136.41       SUBAREA RUNOFF(CFS) =   77.99
EFFECTIVE AREA(ACRES) =   3570.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =     3687.2         PEAK FLOW RATE(CFS) =    2193.28
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   7.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  7.76   FLOW VELOCITY(FEET/SEC.) =  11.08
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.
================================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)     =     3687.2  TC(MIN.) =     49.30
EFFECTIVE AREA(ACRES) =   3570.20  AREA-AVERAGED Fm(INCH/HR)=  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS)   =    2193.28

** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2101.92	29.52	1.241	0.30(0.30)	1.00	2214.2	12111.00
2	2180.33	35.84	1.121	0.30(0.30)	1.00	2685.5	12101.10
3	2193.28	49.30	0.935	0.30(0.30)	1.00	3570.2	12010.00
4	2021.06	56.39	0.870	0.30(0.30)	1.00	3687.2	12000.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S22.DAT
  TIME/DATE OF STUDY: 13:50 04/03/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.576
   2)   10.00;  2.408
   3)   15.00;  1.819
   4)   20.00;  1.553
   5)   25.00;  1.360
   6)   30.00;  1.229
   7)   40.00;  1.044
   8)   50.00;  0.927
   9)   60.00;  0.837
  10)   90.00;  0.688
  11)  120.00;  0.601
  12)  180.00;  0.500
  13)  360.00;  0.362
  14) 1440.00;  0.157
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  12201.00 TO NODE  12202.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   926.94
  ELEVATION DATA: UPSTREAM(FEET) =   3077.00  DOWNSTREAM(FEET) =   2740.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.295
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.020
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.74      0.30     1.000     0   13.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.89
  TOTAL AREA(ACRES) =      5.74   PEAK FLOW RATE(CFS) =      8.89

************************************************************************
  FLOW PROCESS FROM NODE  12202.00 TO NODE  12203.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2740.64  DOWNSTREAM(FEET) =   2551.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   832.53   CHANNEL SLOPE =  0.2271
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.779
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   15.76
  SUBAREA AREA(ACRES) =    18.85       SUBAREA RUNOFF(CFS) =   25.09
  EFFECTIVE AREA(ACRES) =     24.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.6          PEAK FLOW RATE(CFS) =      32.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   6.59
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12203.00 =    1759.47 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  12203.00 TO NODE  12204.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2551.60  DOWNSTREAM(FEET) =   2151.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.86   CHANNEL SLOPE =  0.1944
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.565
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      80.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.54
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   4.01
  Tc(MIN.) =   19.77
  SUBAREA AREA(ACRES) =    83.93       SUBAREA RUNOFF(CFS) =   95.57
  EFFECTIVE AREA(ACRES) =    108.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      108.5         PEAK FLOW RATE(CFS) =     123.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =   9.83
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12204.00 =    3816.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12204.00 TO NODE  12205.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2151.76  DOWNSTREAM(FEET) =   1788.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2363.99   CHANNEL SLOPE =  0.1538
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.57
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.422
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      182.26      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     215.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.86
  AVERAGE FLOW DEPTH(FEET) =   1.52   TRAVEL TIME(MIN.) =   3.63
  Tc(MIN.) =   23.40
  SUBAREA AREA(ACRES) =   182.26       SUBAREA RUNOFF(CFS) =  184.01
  EFFECTIVE AREA(ACRES) =    290.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      290.8         PEAK FLOW RATE(CFS) =     293.57
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =  11.95
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12205.00 =    6180.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12205.00 TO NODE  12206.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1788.16  DOWNSTREAM(FEET) =   1385.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2825.33   CHANNEL SLOPE =  0.1424
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.10
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.302
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      153.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     362.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.37
  AVERAGE FLOW DEPTH(FEET) =   2.07   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   27.21
  SUBAREA AREA(ACRES) =   153.05       SUBAREA RUNOFF(CFS) =  138.05
  EFFECTIVE AREA(ACRES) =    443.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      443.8         PEAK FLOW RATE(CFS) =     400.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.19   FLOW VELOCITY(FEET/SEC.) =  12.74
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12206.00 =    9005.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1385.78  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3579.23   CHANNEL SLOPE =  0.1061
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.55
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.188
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.52      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     453.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.90
  AVERAGE FLOW DEPTH(FEET) =   2.53   TRAVEL TIME(MIN.) =   5.01
  Tc(MIN.) =   32.22
  SUBAREA AREA(ACRES) =   132.52       SUBAREA RUNOFF(CFS) =  105.91
  EFFECTIVE AREA(ACRES) =    576.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      576.4          PEAK FLOW RATE(CFS) =     460.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.55   FLOW VELOCITY(FEET/SEC.) =  11.94
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   32.22
  RAINFALL INTENSITY(INCH/HR) =   1.19
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     576.35
  TOTAL STREAM AREA(ACRES) =     576.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     460.60

****************************************************************************
  FLOW PROCESS FROM NODE  12211.00 TO NODE  12212.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   733.41
  ELEVATION DATA: UPSTREAM(FEET) =   1669.93  DOWNSTREAM(FEET) =   1536.26

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.893
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.949
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        8.90      0.30     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.21
  TOTAL AREA(ACRES) =      8.90   PEAK FLOW RATE(CFS) =     13.21

****************************************************************************
  FLOW PROCESS FROM NODE  12212.00 TO NODE  12213.00 IS CODE =  56
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1536.26  DOWNSTREAM(FEET) =   1416.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1253.05   CHANNEL SLOPE =  0.0960
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.628
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.45
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   4.70
  Tc(MIN.) =   18.59
  SUBAREA AREA(ACRES) =    17.91       SUBAREA RUNOFF(CFS) =   21.41
  EFFECTIVE AREA(ACRES) =     26.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       26.8         PEAK FLOW RATE(CFS) =      32.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   4.93
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12213.00 =    1986.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12213.00 TO NODE  12214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1416.02  DOWNSTREAM(FEET) =   1234.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1877.62   CHANNEL SLOPE =  0.0966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.17
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.439
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      96.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.18
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   4.36
  Tc(MIN.) =   22.95
  SUBAREA AREA(ACRES) =   125.19       SUBAREA RUNOFF(CFS) =  128.36
  EFFECTIVE AREA(ACRES) =    152.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      152.0          PEAK FLOW RATE(CFS) =     155.85
```

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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =   8.36
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12214.00 =    3864.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1234.66  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2510.91   CHANNEL SLOPE =  0.0910
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.305
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.35      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     309.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.08
  AVERAGE FLOW DEPTH(FEET) =   2.15   TRAVEL TIME(MIN.) =   4.15
  Tc(MIN.) =   27.10
  SUBAREA AREA(ACRES) =   339.35       SUBAREA RUNOFF(CFS) =  306.95
  EFFECTIVE AREA(ACRES) =    491.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      491.4         PEAK FLOW RATE(CFS) =     444.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.61   FLOW VELOCITY(FEET/SEC.) =  11.18
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12221.00 =    6374.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.10
  RAINFALL INTENSITY(INCH/HR) =   1.30
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     491.35
  TOTAL STREAM AREA(ACRES) =     491.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     444.44
```



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  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      460.60   32.22    1.188  0.30( 0.30) 1.00     576.4   12201.00
      2      444.44   27.10    1.305  0.30( 0.30) 1.00     491.4   12211.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      882.91   27.10    1.305  0.30( 0.30) 1.00     976.1   12211.00
      2      853.27   32.22    1.188  0.30( 0.30) 1.00    1067.7   12201.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     882.91    Tc(MIN.) =    27.10
  EFFECTIVE AREA(ACRES) =     976.09   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1067.7
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1006.12  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.84   CHANNEL SLOPE =  0.0459
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.57
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.215
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.60      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     935.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.71
  AVERAGE FLOW DEPTH(FEET) =   4.57   TRAVEL TIME(MIN.) =   3.68
  Tc(MIN.) =   30.78
  SUBAREA AREA(ACRES) =   127.60       SUBAREA RUNOFF(CFS) =  105.04
  EFFECTIVE AREA(ACRES) =   1103.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1195.3         PEAK FLOW RATE(CFS) =     908.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.50   FLOW VELOCITY(FEET/SEC.) =  10.63
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

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 FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12231.00 TO NODE  12231.50 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   553.71
 ELEVATION DATA: UPSTREAM(FEET) =   2687.04  DOWNSTREAM(FEET) =   2470.68

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.660
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.330
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        3.48      0.30     1.000     0   10.66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      6.36
 TOTAL AREA(ACRES) =      3.48   PEAK FLOW RATE(CFS) =      6.36

****************************************************************************
 FLOW PROCESS FROM NODE  12231.50 TO NODE  12232.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2470.68  DOWNSTREAM(FEET) =   2375.54
 CHANNEL LENGTH THRU SUBAREA(FEET) =   410.38   CHANNEL SLOPE =  0.2318
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.174
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       12.43      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.86
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.16
 AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   1.33
 Tc(MIN.) =   11.99
 SUBAREA AREA(ACRES) =    12.43       SUBAREA RUNOFF(CFS) =   20.97
 EFFECTIVE AREA(ACRES) =     15.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       15.9         PEAK FLOW RATE(CFS) =      26.84
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   6.19
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12232.00 =     964.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12232.00 TO NODE  12233.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2375.54  DOWNSTREAM(FEET) =   2252.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =   939.16   CHANNEL SLOPE =  0.1305
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.859
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       17.65      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.27
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.85
 AVERAGE FLOW DEPTH(FEET) =   0.60   TRAVEL TIME(MIN.) =   2.68
 Tc(MIN.) =   14.66
 SUBAREA AREA(ACRES) =    17.65       SUBAREA RUNOFF(CFS) =   24.76
 EFFECTIVE AREA(ACRES) =     33.56     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       33.6         PEAK FLOW RATE(CFS) =      47.08
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.67

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   6.23
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12233.00 =    1903.25 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12233.00 TO NODE  12234.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2252.99  DOWNSTREAM(FEET) =   2163.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =   976.53   CHANNEL SLOPE =  0.0921
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.693
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       19.54      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.33
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.01
 AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =   2.71
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  Tc(MIN.) =   17.37
  SUBAREA AREA(ACRES) =    19.54       SUBAREA RUNOFF(CFS) =   24.50
  EFFECTIVE AREA(ACRES) =     53.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       53.1         PEAK FLOW RATE(CFS) =      66.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   6.24
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12234.00 =    2879.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12234.00 TO NODE  12235.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2163.07  DOWNSTREAM(FEET) =   2018.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.65   CHANNEL SLOPE =  0.0759
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.467
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       51.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      93.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.56
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   4.85
  Tc(MIN.) =   22.22
  SUBAREA AREA(ACRES) =    51.14       SUBAREA RUNOFF(CFS) =   53.73
  EFFECTIVE AREA(ACRES) =    104.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =     109.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.27   FLOW VELOCITY(FEET/SEC.) =   6.88
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12235.00 =    4789.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12235.00 TO NODE  12236.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2018.08  DOWNSTREAM(FEET) =   1607.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.94   CHANNEL SLOPE =  0.2162
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06
```



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  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.353
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       47.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     132.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.41
  AVERAGE FLOW DEPTH(FEET) =   1.05   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   25.25
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   44.98
  EFFECTIVE AREA(ACRES) =    151.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =     143.80
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =  10.70
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12236.00 =    6686.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12236.00 TO NODE  12237.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1607.89  DOWNSTREAM(FEET) =   1326.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2213.20   CHANNEL SLOPE =  0.1273
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.253
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       87.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     181.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.65
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   29.08
  SUBAREA AREA(ACRES) =    87.00       SUBAREA RUNOFF(CFS) =   74.64
  EFFECTIVE AREA(ACRES) =    238.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      238.7         PEAK FLOW RATE(CFS) =     204.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.56   FLOW VELOCITY(FEET/SEC.) =  10.01
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12237.00 =    8899.57 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1326.23  DOWNSTREAM(FEET) =   1122.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2236.51   CHANNEL SLOPE =  0.0912
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.87
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.172
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       81.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     236.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.30
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   4.01
  Tc(MIN.) =   33.08
  SUBAREA AREA(ACRES) =    81.83       SUBAREA RUNOFF(CFS) =   64.22
  EFFECTIVE AREA(ACRES) =    320.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      320.5         PEAK FLOW RATE(CFS) =     251.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.92   FLOW VELOCITY(FEET/SEC.) =   9.48
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S21.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2101.92   29.52  0.30( 0.30) 1.00    2214.2   12111.00
      2     2180.33   35.84  0.30( 0.30) 1.00    2685.5   12101.10
      3     2193.28   49.30  0.30( 0.30) 1.00    3570.2   12010.00
      4     2021.06   56.39  0.30( 0.30) 1.00    3687.2   12000.00
    TOTAL AREA(ACRES) =     3687.2

****************************************************************************
  FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
```



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============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2101.92   29.52  0.30( 0.30) 1.00    2214.2   12111.00
      2     2180.33   35.84  0.30( 0.30) 1.00    2685.5   12101.10
      3     2193.28   49.30  0.30( 0.30) 1.00    3570.2   12010.00
      4     2021.06   56.39  0.30( 0.30) 1.00    3687.2   12000.00
    TOTAL AREA(ACRES) =     3687.2

****************************************************************************
  FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2101.92   29.52    1.241  0.30( 0.30) 1.00    2214.2   12111.00
      2     2180.33   35.84    1.121  0.30( 0.30) 1.00    2685.5   12101.10
      3     2193.28   49.30    0.935  0.30( 0.30) 1.00    3570.2   12010.00
      4     2021.06   56.39    0.870  0.30( 0.30) 1.00    3687.2   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      251.54   33.08    1.172  0.30( 0.30) 1.00     320.5   12231.00
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2344.29   29.52    1.241  0.30( 0.30) 1.00    2500.2   12111.00
      2     2397.67   33.08    1.172  0.30( 0.30) 1.00    2800.4   12231.00
      3     2417.17   35.84    1.121  0.30( 0.30) 1.00    3006.0   12101.10
      4     2376.52   49.30    0.935  0.30( 0.30) 1.00    3890.7   12010.00
      5     2185.36   56.39    0.870  0.30( 0.30) 1.00    4007.7   12000.00
    TOTAL AREA(ACRES) =     4007.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2417.17  Tc(MIN.) =   35.838
  EFFECTIVE AREA(ACRES) =   3006.01  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     4007.7
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12241.00 TO NODE  12242.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1122.29  DOWNSTREAM(FEET) =   1062.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.03   CHANNEL SLOPE =  0.0291
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.61
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.065
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      219.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2492.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.39
  AVERAGE FLOW DEPTH(FEET) =   6.59   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =   38.84
  SUBAREA AREA(ACRES) =   219.09       SUBAREA RUNOFF(CFS) =  150.94
  EFFECTIVE AREA(ACRES) =   3225.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4226.8         PEAK FLOW RATE(CFS) =    2417.17
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.49   FLOW VELOCITY(FEET/SEC.) =  11.29
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12242.00 =   33064.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12242.00 TO NODE  12243.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1062.50  DOWNSTREAM(FEET) =    998.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.30   CHANNEL SLOPE =  0.0331
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.026
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      249.96      0.30     0.995     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2499.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.93
  AVERAGE FLOW DEPTH(FEET) =   6.39   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   41.54
  SUBAREA AREA(ACRES) =   249.96       SUBAREA RUNOFF(CFS) =  163.67
  EFFECTIVE AREA(ACRES) =   3475.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4476.8         PEAK FLOW RATE(CFS) =    2417.17
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) =  6.28   FLOW VELOCITY(FEET/SEC.) =  11.83
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12243.00 =   34995.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12243.00 TO NODE  12244.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    998.53  DOWNSTREAM(FEET) =    926.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1863.28   CHANNEL SLOPE =  0.0389
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.09
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.997
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      166.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2469.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.61
  AVERAGE FLOW DEPTH(FEET) =   6.09   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   44.00
  SUBAREA AREA(ACRES) =   166.97       SUBAREA RUNOFF(CFS) =  104.78
  EFFECTIVE AREA(ACRES) =   3642.03     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4643.8         PEAK FLOW RATE(CFS) =    2417.17
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.02   FLOW VELOCITY(FEET/SEC.) =  12.54
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12244.00 =   36859.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12244.00 TO NODE  12251.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    926.00  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1665.37   CHANNEL SLOPE =  0.0170
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.50
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.962
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2442.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.31
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 AVERAGE FLOW DEPTH(FEET) =   7.49   TRAVEL TIME(MIN.) =   2.98
 Tc(MIN.) =   46.98
 SUBAREA AREA(ACRES) =    83.41       SUBAREA RUNOFF(CFS) =   49.72
 EFFECTIVE AREA(ACRES) =   3725.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     4727.2         PEAK FLOW RATE(CFS) =    2417.17
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.46

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.46   FLOW VELOCITY(FEET/SEC.) =   9.28
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2344.29   40.75    1.035  0.30( 0.30) 1.00    3219.6   12111.00
     2     2397.67   44.25    0.994  0.30( 0.30) 1.00    3519.8   12231.00
     3     2417.17   46.98    0.962  0.30( 0.30) 1.00    3725.4   12101.10
     4     2376.52   60.51    0.834  0.30( 0.30) 1.00    4610.1   12010.00
     5     2185.36   67.86    0.798  0.30( 0.30) 1.00    4727.2   12000.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      908.58   30.78    1.215  0.30( 0.30) 1.00    1103.7   12211.00
     2      881.41   35.93    1.119  0.30( 0.30) 1.00    1195.3   12201.00
 LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3111.09   30.78    1.215  0.30( 0.30) 1.00    3535.5   12211.00
     2     3184.75   35.93    1.119  0.30( 0.30) 1.00    4034.4   12201.00
     3     3135.31   40.75    1.035  0.30( 0.30) 1.00    4414.9   12111.00
     4     3144.67   44.25    0.994  0.30( 0.30) 1.00    4715.1   12231.00
     5     3129.73   46.98    0.962  0.30( 0.30) 1.00    4920.7   12101.10
     6     2951.55   60.51    0.834  0.30( 0.30) 1.00    5805.4   12010.00
     7     2721.11   67.86    0.798  0.30( 0.30) 1.00    5922.5   12000.00
   TOTAL AREA(ACRES) =      5922.5

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     3184.75  Tc(MIN.) =   35.932
 EFFECTIVE AREA(ACRES) =   4034.35  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     5922.5
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

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 FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    897.69  DOWNSTREAM(FEET) =    846.91
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2133.08   CHANNEL SLOPE =  0.0238
 GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.91
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.061
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       85.79      0.30      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3214.15
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.35
 AVERAGE FLOW DEPTH(FEET) =   7.91   TRAVEL TIME(MIN.) =   3.13
 Tc(MIN.) =   39.07
 SUBAREA AREA(ACRES) =    85.79       SUBAREA RUNOFF(CFS) =   58.79
 EFFECTIVE AREA(ACRES) =   4120.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     6008.3         PEAK FLOW RATE(CFS) =    3184.75
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.87

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.87   FLOW VELOCITY(FEET/SEC.) =  11.32
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12281.00 =   40657.56 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   39.07
 RAINFALL INTENSITY(INCH/HR) =   1.06
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    4120.14
 TOTAL STREAM AREA(ACRES) =    6008.26
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    3184.75

****************************************************************************
 FLOW PROCESS FROM NODE  12261.00 TO NODE  12261.50 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   378.71
 ELEVATION DATA: UPSTREAM(FEET) =   2264.27  DOWNSTREAM(FEET) =   2072.51
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.694
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.713
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.96      0.30     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.43
  TOTAL AREA(ACRES) =      2.96   PEAK FLOW RATE(CFS) =      6.43

****************************************************************************
  FLOW PROCESS FROM NODE  12261.50 TO NODE  12262.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2072.51  DOWNSTREAM(FEET) =   1875.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   609.41   CHANNEL SLOPE =  0.3233
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.348
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        9.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.60
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.81
  Tc(MIN.) =   10.51
  SUBAREA AREA(ACRES) =     9.89       SUBAREA RUNOFF(CFS) =   18.23
  EFFECTIVE AREA(ACRES) =     12.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.9         PEAK FLOW RATE(CFS) =      23.69
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   6.51
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12262.00 =     988.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12262.00 TO NODE  12263.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1875.51  DOWNSTREAM(FEET) =   1686.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.89   CHANNEL SLOPE =  0.1957
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.57
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.069
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       22.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.81
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   2.37
  Tc(MIN.) =   12.88
  SUBAREA AREA(ACRES) =    22.00       SUBAREA RUNOFF(CFS) =   35.03
  EFFECTIVE AREA(ACRES) =     34.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.8         PEAK FLOW RATE(CFS) =      55.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   7.54
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12263.00 =    1956.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12263.00 TO NODE  12264.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1686.10  DOWNSTREAM(FEET) =   1572.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.28   CHANNEL SLOPE =  0.1198
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.817
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       35.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      79.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.26
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   2.17
  Tc(MIN.) =   15.05
  SUBAREA AREA(ACRES) =    35.72       SUBAREA RUNOFF(CFS) =   48.76
  EFFECTIVE AREA(ACRES) =     70.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =      96.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   7.71
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12264.00 =    2900.29 FEET.
```

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****************************************************************************
  FLOW PROCESS FROM NODE  12264.00 TO NODE  12265.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1572.93  DOWNSTREAM(FEET) =   1506.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =   569.03   CHANNEL SLOPE =  0.1169
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.756
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.21      0.30     0.886     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.886
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     125.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.34
  AVERAGE FLOW DEPTH(FEET) =   1.21   TRAVEL TIME(MIN.) =   1.14
  Tc(MIN.) =   16.18
  SUBAREA AREA(ACRES) =    43.21       SUBAREA RUNOFF(CFS) =   57.96
  EFFECTIVE AREA(ACRES) =    113.78     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      113.8         PEAK FLOW RATE(CFS) =     150.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   8.81
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12265.00 =    3469.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12265.00 TO NODE  12266.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.41  DOWNSTREAM(FEET) =   1311.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2121.93   CHANNEL SLOPE =  0.0920
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.547
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.55      0.30     0.710     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.710
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     201.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.89
  AVERAGE FLOW DEPTH(FEET) =   1.69   TRAVEL TIME(MIN.) =   3.98
  Tc(MIN.) =   20.16
  SUBAREA AREA(ACRES) =    84.55       SUBAREA RUNOFF(CFS) =  101.50
  EFFECTIVE AREA(ACRES) =    198.33     AREA-AVERAGED Fm(INCH/HR) =   0.26
```



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  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.85
  TOTAL AREA(ACRES) =      198.3         PEAK FLOW RATE(CFS) =     230.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.82   FLOW VELOCITY(FEET/SEC.) =   9.28
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12266.00 =    5591.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12266.00 TO NODE  12267.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1311.17  DOWNSTREAM(FEET) =   1232.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1555.18   CHANNEL SLOPE =  0.0506
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.58
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.426
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      160.37      0.30     0.633     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.633
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     319.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.26
  AVERAGE FLOW DEPTH(FEET) =   2.56   TRAVEL TIME(MIN.) =   3.14
  Tc(MIN.) =   23.30
  SUBAREA AREA(ACRES) =   160.37       SUBAREA RUNOFF(CFS) =  178.37
  EFFECTIVE AREA(ACRES) =    358.70     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.75
  TOTAL AREA(ACRES) =      358.7         PEAK FLOW RATE(CFS) =     387.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.83   FLOW VELOCITY(FEET/SEC.) =   8.72
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12267.00 =    7146.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12267.00 TO NODE  12268.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1232.47  DOWNSTREAM(FEET) =   1141.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2111.19   CHANNEL SLOPE =  0.0430
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.17
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.296
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      100.65      0.30     0.970     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.970
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     432.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.47
  AVERAGE FLOW DEPTH(FEET) =   3.14   TRAVEL TIME(MIN.) =   4.15
  Tc(MIN.) =   27.45
  SUBAREA AREA(ACRES) =   100.65       SUBAREA RUNOFF(CFS) =   91.02
  EFFECTIVE AREA(ACRES) =    459.35     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      459.4         PEAK FLOW RATE(CFS) =     436.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.15   FLOW VELOCITY(FEET/SEC.) =   8.51
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12268.00 =    9257.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12268.00 TO NODE  12269.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1141.79  DOWNSTREAM(FEET) =   1115.83
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1295.17   CHANNEL SLOPE =  0.0200
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.04
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.216
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      103.26      0.30     0.838     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.838
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     481.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.62
  AVERAGE FLOW DEPTH(FEET) =   4.03   TRAVEL TIME(MIN.) =   3.26
  Tc(MIN.) =   30.71
  SUBAREA AREA(ACRES) =   103.26       SUBAREA RUNOFF(CFS) =   89.64
  EFFECTIVE AREA(ACRES) =    562.61     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      562.6         PEAK FLOW RATE(CFS) =     492.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.08   FLOW VELOCITY(FEET/SEC.) =   6.66
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.00 =   10552.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.00 TO NODE  12269.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1115.83  DOWNSTREAM(FEET) =   1100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1137.63   CHANNEL SLOPE =  0.0139
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.57
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.156
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       50.20      0.30     0.708     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.708
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     514.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.90
  AVERAGE FLOW DEPTH(FEET) =   4.56   TRAVEL TIME(MIN.) =   3.21
  Tc(MIN.) =   33.92
  SUBAREA AREA(ACRES) =    50.20       SUBAREA RUNOFF(CFS) =   42.65
  EFFECTIVE AREA(ACRES) =    612.81     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      612.8         PEAK FLOW RATE(CFS) =     505.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.52   FLOW VELOCITY(FEET/SEC.) =   5.87
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.50 =   11690.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.50 TO NODE  12270.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1091.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1219.38   CHANNEL SLOPE =  0.0073
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.50
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.077
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       98.30      0.30     0.583     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.583
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     545.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.73
  AVERAGE FLOW DEPTH(FEET) =   5.49   TRAVEL TIME(MIN.) =   4.29
  Tc(MIN.) =   38.22
  SUBAREA AREA(ACRES) =    98.30       SUBAREA RUNOFF(CFS) =   79.81
  EFFECTIVE AREA(ACRES) =    711.11     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      711.1         PEAK FLOW RATE(CFS) =     541.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.47   FLOW VELOCITY(FEET/SEC.) =   4.72
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12270.00 =   12909.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12270.00 TO NODE  12271.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1091.06  DOWNSTREAM(FEET) =    962.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1995.19   CHANNEL SLOPE =  0.0646
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.38
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.029
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.93      0.30     0.746     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.746
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     607.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.80
  AVERAGE FLOW DEPTH(FEET) =   3.36   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   41.29
  SUBAREA AREA(ACRES) =   181.93       SUBAREA RUNOFF(CFS) =  131.82
  EFFECTIVE AREA(ACRES) =    893.04     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.76
  TOTAL AREA(ACRES) =      893.0         PEAK FLOW RATE(CFS) =     642.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.46   FLOW VELOCITY(FEET/SEC.) =  10.97
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12271.00 =   14904.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12271.00 TO NODE  12272.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    962.23  DOWNSTREAM(FEET) =    917.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1613.85   CHANNEL SLOPE =  0.0278
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.50
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.991
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.79      0.30     0.910     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     701.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.25
  AVERAGE FLOW DEPTH(FEET) =   4.48   TRAVEL TIME(MIN.) =   3.26
  Tc(MIN.) =   44.55
  SUBAREA AREA(ACRES) =   181.79       SUBAREA RUNOFF(CFS) =  117.44
  EFFECTIVE AREA(ACRES) =   1074.83     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.79
  TOTAL AREA(ACRES) =     1074.8         PEAK FLOW RATE(CFS) =     729.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.57   FLOW VELOCITY(FEET/SEC.) =   8.35
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12272.00 =   16518.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    917.38  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3182.34   CHANNEL SLOPE =  0.0221
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.92
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.914
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.99      0.30     0.948     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.948
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     751.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.74
  AVERAGE FLOW DEPTH(FEET) =   4.90   TRAVEL TIME(MIN.) =   6.85
  Tc(MIN.) =   51.40
  SUBAREA AREA(ACRES) =    79.99       SUBAREA RUNOFF(CFS) =   45.36
  EFFECTIVE AREA(ACRES) =   1154.82     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     1154.8         PEAK FLOW RATE(CFS) =     729.31
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.83   FLOW VELOCITY(FEET/SEC.) =   7.67
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12281.00 =   19701.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 51.40
RAINFALL INTENSITY(INCH/HR) = 0.91
AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.80
EFFECTIVE STREAM AREA(ACRES) = 1154.82
TOTAL STREAM AREA(ACRES) = 1154.82
PEAK FLOW RATE(CFS) AT CONFLUENCE = 729.31

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3111.09	33.93	1.156	0.30(0.30)	1.00	3621.3	12211.00
1	3184.75	39.07	1.061	0.30(0.30)	1.00	4120.1	12201.00
1	3135.31	43.90	0.998	0.30(0.30)	1.00	4500.7	12111.00
1	3144.67	47.39	0.958	0.30(0.30)	1.00	4800.9	12231.00
1	3129.73	50.13	0.926	0.30(0.30)	1.00	5006.5	12101.10
1	2951.55	63.71	0.819	0.30(0.30)	1.00	5891.2	12010.00
1	2721.11	71.13	0.782	0.30(0.30)	1.00	6008.3	12000.00
2	729.31	51.40	0.914	0.30(0.24)	0.80	1154.8	12261.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3765.21	33.93	1.156	0.30(0.29)	0.97	4383.5	12211.00
2	3859.78	39.07	1.061	0.30(0.29)	0.96	4997.8	12201.00
3	3835.74	43.90	0.998	0.30(0.29)	0.96	5486.9	12111.00
4	3860.08	47.39	0.958	0.30(0.29)	0.96	5865.6	12231.00
5	3853.07	50.13	0.926	0.30(0.29)	0.96	6132.8	12101.10
6	3842.35	51.40	0.914	0.30(0.29)	0.96	6244.2	12261.00
7	3577.22	63.71	0.819	0.30(0.29)	0.97	7046.0	12010.00
8	3306.92	71.13	0.782	0.30(0.29)	0.97	7163.1	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3860.08 Tc(MIN.) = 47.39
EFFECTIVE AREA(ACRES) = 5865.60 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7163.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

****
FLOW PROCESS FROM NODE 12281.00 TO NODE 12282.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 846.91 DOWNSTREAM(FEET) = 835.60
CHANNEL LENGTH THRU SUBAREA(FEET) = 1561.00 CHANNEL SLOPE = 0.0072
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.73
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.920
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	267.56	0.30	0.867	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3939.58
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.74
AVERAGE FLOW DEPTH(FEET) = 11.72 TRAVEL TIME(MIN.) = 3.36
Tc(MIN.) = 50.75
SUBAREA AREA(ACRES) = 267.56 SUBAREA RUNOFF(CFS) = 158.97
EFFECTIVE AREA(ACRES) = 6133.16 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7430.6 PEAK FLOW RATE(CFS) = 3860.08
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.61 FLOW VELOCITY(FEET/SEC.) = 7.70
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12282.00 = 42218.56 FEET.
==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 7430.6 TC(MIN.) = 50.75
EFFECTIVE AREA(ACRES) = 6133.16 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.959
PEAK FLOW RATE(CFS) = 3860.08

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3765.21	37.31	1.094	0.30(0.29)	0.96	4651.1	12211.00
2	3859.78	42.43	1.016	0.30(0.29)	0.96	5265.3	12201.00
3	3835.74	47.26	0.959	0.30(0.29)	0.96	5754.5	12111.00
4	3860.08	50.75	0.920	0.30(0.29)	0.96	6133.2	12231.00
5	3853.07	53.50	0.896	0.30(0.29)	0.96	6400.3	12101.10
6	3842.35	54.77	0.884	0.30(0.29)	0.96	6511.7	12261.00
7	3577.22	67.15	0.802	0.30(0.29)	0.96	7313.6	12010.00
8	3306.92	74.64	0.764	0.30(0.29)	0.96	7430.6	12000.00

==========
==========
END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S23.DAT
  TIME/DATE OF STUDY: 13:50 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.576
   2)   10.00;  2.408
   3)   15.00;  1.819
   4)   20.00;  1.553
   5)   25.00;  1.360
   6)   30.00;  1.229
   7)   40.00;  1.044
   8)   50.00;  0.927
   9)   60.00;  0.837
  10)   90.00;  0.688
  11)  120.00;  0.601
  12)  180.00;  0.500
  13)  360.00;  0.362
  14) 1440.00;  0.157
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12300.00 TO NODE  12301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   924.36
  ELEVATION DATA: UPSTREAM(FEET) =   1712.53  DOWNSTREAM(FEET) =   1490.12

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.417
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.888
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.30     1.000      0   14.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.52
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =      9.52

**************************************************************************
  FLOW PROCESS FROM NODE  12301.00 TO NODE  12302.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1490.12  DOWNSTREAM(FEET) =   1117.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1564.45   CHANNEL SLOPE =  0.2380
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.644
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.97      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.73
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   3.88
  Tc(MIN.) =   18.29
  SUBAREA AREA(ACRES) =    39.97       SUBAREA RUNOFF(CFS) =   48.34
  EFFECTIVE AREA(ACRES) =     46.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       46.6          PEAK FLOW RATE(CFS) =      56.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   8.08
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12302.00 =    2488.81 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  56
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1117.78  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2216.41   CHANNEL SLOPE =  0.1520
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.439
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      82.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.93
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   4.66
  Tc(MIN.) =   22.95
  SUBAREA AREA(ACRES) =    51.51       SUBAREA RUNOFF(CFS) =   52.81
  EFFECTIVE AREA(ACRES) =     98.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       98.1         PEAK FLOW RATE(CFS) =     100.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =   8.49
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S22.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     3765.21   37.31  0.30( 0.29) 0.96    4651.1   12211.00
      2     3859.78   42.43  0.30( 0.29) 0.96    5265.3   12201.00
      3     3835.74   47.26  0.30( 0.29) 0.96    5754.5   12111.00
      4     3860.08   50.75  0.30( 0.29) 0.96    6133.2   12231.00
      5     3853.07   53.50  0.30( 0.29) 0.96    6400.3   12101.10
      6     3842.35   54.77  0.30( 0.29) 0.96    6511.7   12261.00
      7     3577.22   67.15  0.30( 0.29) 0.96    7313.6   12010.00
      8     3306.92   74.64  0.30( 0.29) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     3765.21   37.31  0.30( 0.29) 0.96    4651.1   12211.00
      2     3859.78   42.43  0.30( 0.29) 0.96    5265.3   12201.00
      3     3835.74   47.26  0.30( 0.29) 0.96    5754.5   12111.00
      4     3860.08   50.75  0.30( 0.29) 0.96    6133.2   12231.00
      5     3853.07   53.50  0.30( 0.29) 0.96    6400.3   12101.10
      6     3842.35   54.77  0.30( 0.29) 0.96    6511.7   12261.00
      7     3577.22   67.15  0.30( 0.29) 0.96    7313.6   12010.00
      8     3306.92   74.64  0.30( 0.29) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    835.60  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1568.10   CHANNEL SLOPE =  0.0349
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.901
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.15      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3873.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.49
  AVERAGE FLOW DEPTH(FEET) =   6.33   TRAVEL TIME(MIN.) =   2.09
  Tc(MIN.) =   52.85
  SUBAREA AREA(ACRES) =    51.15       SUBAREA RUNOFF(CFS) =   27.69
  EFFECTIVE AREA(ACRES) =   6184.31     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     7481.8         PEAK FLOW RATE(CFS) =    3860.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.32   FLOW VELOCITY(FEET/SEC.) =  12.47
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3765.21	39.42	1.055	0.30(0.29)	0.96	4702.2	12211.00
2	3859.78	44.52	0.991	0.30(0.29)	0.96	5316.5	12201.00
3	3835.74	49.36	0.934	0.30(0.29)	0.96	5805.6	12111.00
4	3860.08	52.85	0.901	0.30(0.29)	0.96	6184.3	12231.00
5	3853.07	55.59	0.877	0.30(0.29)	0.96	6451.5	12101.10
6	3842.35	56.87	0.865	0.30(0.29)	0.96	6562.9	12261.00
7	3577.22	69.28	0.791	0.30(0.29)	0.96	7364.8	12010.00
8	3306.92	76.83	0.753	0.30(0.29)	0.96	7481.8	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	100.62	22.95	1.439	0.30(0.30)	1.00	98.1	12300.00

LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3391.60	22.95	1.439	0.30(0.29)	0.96	2836.2	12300.00
2	3831.89	39.42	1.055	0.30(0.29)	0.96	4800.4	12211.00
3	3920.83	44.52	0.991	0.30(0.29)	0.96	5414.6	12201.00
4	3891.79	49.36	0.934	0.30(0.29)	0.96	5903.8	12111.00
5	3913.21	52.85	0.901	0.30(0.29)	0.96	6282.4	12231.00
6	3904.01	55.59	0.877	0.30(0.29)	0.96	6549.6	12101.10
7	3892.28	56.87	0.865	0.30(0.29)	0.96	6661.0	12261.00
8	3620.59	69.28	0.791	0.30(0.29)	0.96	7462.9	12010.00
9	3346.97	76.83	0.753	0.30(0.29)	0.96	7579.9	12000.00

TOTAL AREA(ACRES) = 7579.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3920.83 Tc(MIN.) = 44.519
EFFECTIVE AREA(ACRES) = 5414.63 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7579.9
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

****
FLOW PROCESS FROM NODE 12320.00 TO NODE 12321.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 780.80 DOWNSTREAM(FEET) = 761.66
CHANNEL LENGTH THRU SUBAREA(FEET) = 2102.41 CHANNEL SLOPE = 0.0091
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.03
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.938
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	180.82	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3972.75
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.73
AVERAGE FLOW DEPTH(FEET) = 9.02 TRAVEL TIME(MIN.) = 4.54
Tc(MIN.) = 49.05
SUBAREA AREA(ACRES) = 180.82 SUBAREA RUNOFF(CFS) = 103.85
EFFECTIVE AREA(ACRES) = 5595.45 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7760.8 PEAK FLOW RATE(CFS) = 3920.83
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.95 FLOW VELOCITY(FEET/SEC.) = 7.70
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12321.00 = 45889.07 FEET.

****
FLOW PROCESS FROM NODE 12321.00 TO NODE 12322.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 761.66 DOWNSTREAM(FEET) = 710.30
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.13 CHANNEL SLOPE = 0.0268
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.89
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.910
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	217.17	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3980.48
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.43
AVERAGE FLOW DEPTH(FEET) = 6.88 TRAVEL TIME(MIN.) = 2.79
Tc(MIN.) = 51.85
SUBAREA AREA(ACRES) = 217.17 SUBAREA RUNOFF(CFS) = 119.31
EFFECTIVE AREA(ACRES) = 5812.62 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7977.9 PEAK FLOW RATE(CFS) = 3920.83
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.82 FLOW VELOCITY(FEET/SEC.) = 11.38
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12322.00 = 47805.20 FEET.

****
FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    710.30  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1977.07   CHANNEL SLOPE =  0.0162
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.82
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.879
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.67      0.30     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3971.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.54
  AVERAGE FLOW DEPTH(FEET) =   7.80   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   55.30
  SUBAREA AREA(ACRES) =   194.67       SUBAREA RUNOFF(CFS) =  101.55
  EFFECTIVE AREA(ACRES) =   6007.29     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     8172.6         PEAK FLOW RATE(CFS) =    3920.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.75   FLOW VELOCITY(FEET/SEC.) =   9.50
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   55.30
  RAINFALL INTENSITY(INCH/HR) =   0.88
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96
  EFFECTIVE STREAM AREA(ACRES) =    6007.29
  TOTAL STREAM AREA(ACRES) =    8172.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    3920.83

****************************************************************************
  FLOW PROCESS FROM NODE  12330.00 TO NODE  12331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   994.42
  ELEVATION DATA: UPSTREAM(FEET) =   1754.00  DOWNSTREAM(FEET) =   1530.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.046
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.817
```



```
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        3.33      0.30     1.000     0   15.05
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.55
  TOTAL AREA(ACRES) =      3.33   PEAK FLOW RATE(CFS) =      4.55

****************************************************************************
  FLOW PROCESS FROM NODE  12331.00 TO NODE  12332.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1530.30  DOWNSTREAM(FEET) =   1412.81
  CHANNEL LENGTH THRU SUBAREA(FEET) =   946.66   CHANNEL SLOPE =  0.1241
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.637
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.08      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.67
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   3.38
  Tc(MIN.) =   18.42
  SUBAREA AREA(ACRES) =    28.08       SUBAREA RUNOFF(CFS) =   33.79
  EFFECTIVE AREA(ACRES) =     31.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.4         PEAK FLOW RATE(CFS) =      37.79
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   5.71
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12332.00 =    1941.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12332.00 TO NODE  12333.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1412.81  DOWNSTREAM(FEET) =   1235.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.37   CHANNEL SLOPE =  0.0907
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.89
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.404
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       44.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.00
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   5.44
  Tc(MIN.) =   23.87
  SUBAREA AREA(ACRES) =    44.96       SUBAREA RUNOFF(CFS) =   44.66
  EFFECTIVE AREA(ACRES) =     76.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.4         PEAK FLOW RATE(CFS) =      75.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =   6.48
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12333.00 =    3900.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12333.00 TO NODE  12334.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1235.19  DOWNSTREAM(FEET) =   1013.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1921.81   CHANNEL SLOPE =  0.1151
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.01
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.277
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      89.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
  AVERAGE FLOW DEPTH(FEET) =   1.00   TRAVEL TIME(MIN.) =   4.32
  Tc(MIN.) =   28.18
  SUBAREA AREA(ACRES) =    30.50       SUBAREA RUNOFF(CFS) =   26.81
  EFFECTIVE AREA(ACRES) =    106.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.9         PEAK FLOW RATE(CFS) =      93.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   7.54
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12334.00 =    5822.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12334.00 TO NODE  12335.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1013.96  DOWNSTREAM(FEET) =    809.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2029.80   CHANNEL SLOPE =  0.1006
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.44
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.188
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     152.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.44
  AVERAGE FLOW DEPTH(FEET) =   1.41   TRAVEL TIME(MIN.) =   4.01
  Tc(MIN.) =   32.20
  SUBAREA AREA(ACRES) =   145.82       SUBAREA RUNOFF(CFS) =  116.60
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =     202.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.65   FLOW VELOCITY(FEET/SEC.) =   9.19
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12335.00 =    7852.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    809.84  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.44   CHANNEL SLOPE =  0.0691
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.117
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     220.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.28
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   3.84
  Tc(MIN.) =   36.03
  SUBAREA AREA(ACRES) =    50.71       SUBAREA RUNOFF(CFS) =   37.31
  EFFECTIVE AREA(ACRES) =    303.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.4         PEAK FLOW RATE(CFS) =     223.22
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.94

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.94   FLOW VELOCITY(FEET/SEC.) =   8.32
 LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12340.00 =    9757.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   36.03
 RAINFALL INTENSITY(INCH/HR) =   1.12
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     303.40
 TOTAL STREAM AREA(ACRES) =     303.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     223.22

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3391.60   34.15    1.152  0.30( 0.29) 0.97    3428.8   12300.00
     1     3831.89   50.27    0.925  0.30( 0.29) 0.96    5393.0   12211.00
     1     3920.83   55.30    0.879  0.30( 0.29) 0.96    6007.3   12201.00
     1     3891.79   60.17    0.836  0.30( 0.29) 0.96    6496.4   12111.00
     1     3913.21   63.64    0.819  0.30( 0.29) 0.96    6875.1   12231.00
     1     3904.01   66.39    0.805  0.30( 0.29) 0.96    7142.3   12101.10
     1     3892.28   67.68    0.799  0.30( 0.29) 0.96    7253.7   12261.00
     1     3620.59   80.31    0.736  0.30( 0.29) 0.97    8055.6   12010.00
     1     3346.97   88.10    0.697  0.30( 0.29) 0.97    8172.6   12000.00
     2      223.22   36.03    1.117  0.30( 0.30) 1.00     303.4   12330.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3612.16   34.15    1.152  0.30( 0.29) 0.97    3716.3   12300.00
     2     3666.33   36.03    1.117  0.30( 0.29) 0.97    3962.0   12330.00
     3     4002.46   50.27    0.925  0.30( 0.29) 0.97    5696.4   12211.00
     4     4079.02   55.30    0.879  0.30( 0.29) 0.97    6310.7   12201.00
     5     4038.21   60.17    0.836  0.30( 0.29) 0.97    6799.8   12111.00
     6     4054.93   63.64    0.819  0.30( 0.29) 0.97    7178.5   12231.00
     7     4041.99   66.39    0.805  0.30( 0.29) 0.96    7445.7   12101.10
     8     4028.52   67.68    0.799  0.30( 0.29) 0.96    7557.1   12261.00
     9     3739.69   80.31    0.736  0.30( 0.29) 0.97    8359.0   12010.00
    10     3455.52   88.10    0.697  0.30( 0.29) 0.97    8476.0   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    4079.02    Tc(MIN.) =    55.30
 EFFECTIVE AREA(ACRES) =    6310.69   AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
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 TOTAL AREA(ACRES) =     8476.0
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12340.00 TO NODE  12341.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    678.19  DOWNSTREAM(FEET) =    630.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2827.23   CHANNEL SLOPE =  0.0170
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.92
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.836
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      317.33      0.30     0.999     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4155.68
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.81
 AVERAGE FLOW DEPTH(FEET) =   7.89   TRAVEL TIME(MIN.) =   4.80
 Tc(MIN.) =   60.11
 SUBAREA AREA(ACRES) =   317.33       SUBAREA RUNOFF(CFS) =  153.32
 EFFECTIVE AREA(ACRES) =   6628.02     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     8793.3          PEAK FLOW RATE(CFS) =    4079.02
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.82

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.82   FLOW VELOCITY(FEET/SEC.) =   9.76
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12341.00 =   52609.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12341.00 TO NODE  12342.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    630.21  DOWNSTREAM(FEET) =    601.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2006.47   CHANNEL SLOPE =  0.0142
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.21
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.818
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      124.13      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4107.98
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.17
```

```
  AVERAGE FLOW DEPTH(FEET) =   8.20   TRAVEL TIME(MIN.) =   3.65
  Tc(MIN.) =   63.75
  SUBAREA AREA(ACRES) =   124.13       SUBAREA RUNOFF(CFS) =   57.92
  EFFECTIVE AREA(ACRES) =   6752.15     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     8917.5         PEAK FLOW RATE(CFS) =    4079.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.17   FLOW VELOCITY(FEET/SEC.) =   9.15
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12342.00 =   54615.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    601.66  DOWNSTREAM(FEET) =    572.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.49   CHANNEL SLOPE =  0.0156
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.02
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.802
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.92      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4100.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.48
  AVERAGE FLOW DEPTH(FEET) =   8.01   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   67.07
  SUBAREA AREA(ACRES) =    96.92       SUBAREA RUNOFF(CFS) =   43.79
  EFFECTIVE AREA(ACRES) =   6849.07     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     9014.4         PEAK FLOW RATE(CFS) =    4079.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.99   FLOW VELOCITY(FEET/SEC.) =   9.46
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     9014.4  TC(MIN.) =     67.07
  EFFECTIVE AREA(ACRES) =   6849.07  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.969
  PEAK FLOW RATE(CFS)   =    4079.02

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
    NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
       1     3612.16   46.29    0.970  0.30( 0.29) 0.97    4254.7   12300.00
       2     3666.33   48.13    0.949  0.30( 0.29) 0.97    4500.4   12330.00
       3     4002.46   62.09    0.827  0.30( 0.29) 0.97    6234.8   12211.00
       4     4079.02   67.07    0.802  0.30( 0.29) 0.97    6849.1   12201.00
       5     4038.21   71.97    0.778  0.30( 0.29) 0.97    7338.2   12111.00
       6     4054.93   75.42    0.760  0.30( 0.29) 0.97    7716.9   12231.00
       7     4041.99   78.19    0.747  0.30( 0.29) 0.97    7984.1   12101.10
       8     4028.52   79.48    0.740  0.30( 0.29) 0.97    8095.5   12261.00
       9     3739.69   92.37    0.681  0.30( 0.29) 0.97    8897.3   12010.00
      10     3455.52  100.42    0.658  0.30( 0.29) 0.97    9014.4   12000.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S24.DAT
  TIME/DATE OF STUDY: 13:50 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.576
   2)   10.00;  2.408
   3)   15.00;  1.819
   4)   20.00;  1.553
   5)   25.00;  1.360
   6)   30.00;  1.229
   7)   40.00;  1.044
   8)   50.00;  0.927
   9)   60.00;  0.837
  10)   90.00;  0.688
  11)  120.00;  0.601
  12)  180.00;  0.500
  13)  360.00;  0.362
  14) 1440.00;  0.157
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12400.00 TO NODE  12401.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   981.52
  ELEVATION DATA: UPSTREAM(FEET) =   2579.17  DOWNSTREAM(FEET) =   2249.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.811
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.959
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.82      0.30     1.000     0   13.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.17
  TOTAL AREA(ACRES) =      8.82   PEAK FLOW RATE(CFS) =     13.17

**************************************************************************
  FLOW PROCESS FROM NODE  12401.00 TO NODE  12402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2249.14  DOWNSTREAM(FEET) =   2103.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   975.11   CHANNEL SLOPE =  0.1490
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.745
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.29      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.30
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   2.58
  Tc(MIN.) =   16.39
  SUBAREA AREA(ACRES) =    46.29       SUBAREA RUNOFF(CFS) =   60.20
  EFFECTIVE AREA(ACRES) =     55.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.1          PEAK FLOW RATE(CFS) =      71.68
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.82   FLOW VELOCITY(FEET/SEC.) =   7.52
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12402.00 =    1956.63 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12402.00 TO NODE  12403.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2103.89  DOWNSTREAM(FEET) =   1771.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.50   CHANNEL SLOPE =  0.1768
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.560
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     102.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.01
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   3.48
  Tc(MIN.) =   19.87
  SUBAREA AREA(ACRES) =    54.97       SUBAREA RUNOFF(CFS) =   62.34
  EFFECTIVE AREA(ACRES) =    110.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =     124.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =   9.58
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12403.00 =    3837.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12403.00 TO NODE  12404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1771.34  DOWNSTREAM(FEET) =   1462.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2888.53   CHANNEL SLOPE =  0.1070
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.356
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     183.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.12
  AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   5.28
  Tc(MIN.) =   25.15
  SUBAREA AREA(ACRES) =   123.02       SUBAREA RUNOFF(CFS) =  116.94
  EFFECTIVE AREA(ACRES) =    233.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      233.1         PEAK FLOW RATE(CFS) =     221.57
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =   9.64
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12404.00 =    6725.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12404.00 TO NODE  12405.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1462.30  DOWNSTREAM(FEET) =   1308.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.25   CHANNEL SLOPE =  0.0800
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.270
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      241.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     327.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.79
  AVERAGE FLOW DEPTH(FEET) =   2.29   TRAVEL TIME(MIN.) =   3.28
  Tc(MIN.) =   28.43
  SUBAREA AREA(ACRES) =   241.71       SUBAREA RUNOFF(CFS) =  211.07
  EFFECTIVE AREA(ACRES) =    474.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      474.8         PEAK FLOW RATE(CFS) =     414.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.60   FLOW VELOCITY(FEET/SEC.) =  10.47
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12405.00 =    8650.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12405.00 TO NODE  12406.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.28  DOWNSTREAM(FEET) =   1154.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1923.41   CHANNEL SLOPE =  0.0802
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.205
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.96      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     511.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.12
  AVERAGE FLOW DEPTH(FEET) =   2.91   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   31.31
  SUBAREA AREA(ACRES) =   238.96       SUBAREA RUNOFF(CFS) =  194.60
  EFFECTIVE AREA(ACRES) =    713.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      713.8         PEAK FLOW RATE(CFS) =     581.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.11   FLOW VELOCITY(FEET/SEC.) =  11.53
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12406.00 =   10574.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1154.02  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1607.69   CHANNEL SLOPE =  0.0503
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.58
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.154
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     603.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.84
  AVERAGE FLOW DEPTH(FEET) =   3.58   TRAVEL TIME(MIN.) =   2.72
  Tc(MIN.) =   34.03
  SUBAREA AREA(ACRES) =    58.02       SUBAREA RUNOFF(CFS) =   44.62
  EFFECTIVE AREA(ACRES) =    771.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      771.8         PEAK FLOW RATE(CFS) =     593.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.54   FLOW VELOCITY(FEET/SEC.) =   9.80
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.03
  RAINFALL INTENSITY(INCH/HR) =   1.15
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     771.79
  TOTAL STREAM AREA(ACRES) =     771.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     593.54

****************************************************************************
  FLOW PROCESS FROM NODE  12410.00 TO NODE  12411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   966.15
  ELEVATION DATA: UPSTREAM(FEET) =   2215.42  DOWNSTREAM(FEET) =   1909.05

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.886
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.950
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.99      0.30     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.35
  TOTAL AREA(ACRES) =      8.99   PEAK FLOW RATE(CFS) =     13.35

****************************************************************************
  FLOW PROCESS FROM NODE  12411.00 TO NODE  12412.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1909.05  DOWNSTREAM(FEET) =   1794.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.59   CHANNEL SLOPE =  0.1215
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.707
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.89
  AVERAGE FLOW DEPTH(FEET) =   0.47   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =   17.10
  SUBAREA AREA(ACRES) =    18.56       SUBAREA RUNOFF(CFS) =   23.50
  EFFECTIVE AREA(ACRES) =     27.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.5         PEAK FLOW RATE(CFS) =      34.89
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.57   FLOW VELOCITY(FEET/SEC.) =   5.50
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12412.00 =    1909.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12412.00 TO NODE  12413.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.38  DOWNSTREAM(FEET) =   1649.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.82   CHANNEL SLOPE =  0.1560
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.580
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.48
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   2.38
  Tc(MIN.) =   19.49
  SUBAREA AREA(ACRES) =    16.09       SUBAREA RUNOFF(CFS) =   18.54
  EFFECTIVE AREA(ACRES) =     43.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       43.6         PEAK FLOW RATE(CFS) =      50.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =   6.74
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12413.00 =    2836.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12413.00 TO NODE  12414.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1649.76  DOWNSTREAM(FEET) =   1365.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1906.16   CHANNEL SLOPE =  0.1490
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.420
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.14      0.30     1.000     -
```



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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      88.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.04
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   3.95
  Tc(MIN.) =   23.44
  SUBAREA AREA(ACRES) =    75.14       SUBAREA RUNOFF(CFS) =   75.77
  EFFECTIVE AREA(ACRES) =    118.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.8          PEAK FLOW RATE(CFS) =     119.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   8.91
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12414.00 =    4742.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1365.78  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3038.90   CHANNEL SLOPE =  0.0963
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.65
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.250
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     184.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.80
  AVERAGE FLOW DEPTH(FEET) =   1.59   TRAVEL TIME(MIN.) =   5.75
  Tc(MIN.) =   29.19
  SUBAREA AREA(ACRES) =   151.43       SUBAREA RUNOFF(CFS) =  129.51
  EFFECTIVE AREA(ACRES) =    270.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      270.2          PEAK FLOW RATE(CFS) =     231.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.80   FLOW VELOCITY(FEET/SEC.) =   9.42
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12420.00 =    7781.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   29.19
 RAINFALL INTENSITY(INCH/HR) =   1.25
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     270.21
 TOTAL STREAM AREA(ACRES) =     270.21
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     231.10

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      593.54   34.03    1.154  0.30( 0.30) 1.00     771.8   12400.00
     2      231.10   29.19    1.250  0.30( 0.30) 1.00     270.2   12410.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      797.28   29.19    1.250  0.30( 0.30) 1.00     932.2   12410.00
     2      801.34   34.03    1.154  0.30( 0.30) 1.00    1042.0   12400.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     801.34    Tc(MIN.) =    34.03
 EFFECTIVE AREA(ACRES) =    1042.00   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1042.0
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12420.00 TO NODE  12421.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1073.11  DOWNSTREAM(FEET) =   1005.32
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2235.12   CHANNEL SLOPE =  0.0303
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.92
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.078
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      218.57      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     877.92
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.05
 AVERAGE FLOW DEPTH(FEET) =   4.90   TRAVEL TIME(MIN.) =   4.12
 Tc(MIN.) =   38.15
 SUBAREA AREA(ACRES) =   218.57       SUBAREA RUNOFF(CFS) =  153.10
 EFFECTIVE AREA(ACRES) =   1260.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1260.6         PEAK FLOW RATE(CFS) =     883.00
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.91

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.91   FLOW VELOCITY(FEET/SEC.) =   9.07
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12421.00 =   14417.13 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      899.05   33.30    1.168  0.30( 0.30) 1.00    1150.8   12410.00
     2      883.00   38.15    1.078  0.30( 0.30) 1.00    1260.6   12400.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     899.05  Tc(MIN.) =   33.30
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1150.77

****************************************************************************
 FLOW PROCESS FROM NODE  12421.00 TO NODE  12422.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1005.32  DOWNSTREAM(FEET) =    879.13
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.31   CHANNEL SLOPE =  0.0451
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.73
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.088
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      241.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     984.72
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.79
 AVERAGE FLOW DEPTH(FEET) =   4.70   TRAVEL TIME(MIN.) =   4.33
 Tc(MIN.) =   37.62
 SUBAREA AREA(ACRES) =   241.55       SUBAREA RUNOFF(CFS) =  171.32
 EFFECTIVE AREA(ACRES) =   1392.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1502.1         PEAK FLOW RATE(CFS) =     987.50
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.71

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.71   FLOW VELOCITY(FEET/SEC.) =  10.80
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12422.00 =   17217.44 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      987.50   37.62    1.088  0.30( 0.30) 1.00    1392.3   12410.00
     2      966.37   42.50    1.015  0.30( 0.30) 1.00    1502.1   12400.00
```

```
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     987.50  Tc(MIN.) =   37.62
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1392.32

****************************************************************************
 FLOW PROCESS FROM NODE  12422.00 TO NODE  12423.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    879.13  DOWNSTREAM(FEET) =    815.17
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.90   CHANNEL SLOPE =  0.0333
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.21
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.034
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      151.63      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1037.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.80
 AVERAGE FLOW DEPTH(FEET) =   5.19   TRAVEL TIME(MIN.) =   3.26
 Tc(MIN.) =   40.89
 SUBAREA AREA(ACRES) =   151.63       SUBAREA RUNOFF(CFS) =  100.13
 EFFECTIVE AREA(ACRES) =   1543.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1653.8          PEAK FLOW RATE(CFS) =    1019.53
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.15

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.15   FLOW VELOCITY(FEET/SEC.) =   9.74
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12423.00 =   19136.34 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1019.53   40.89    1.034  0.30( 0.30) 1.00    1543.9   12410.00
     2     1006.72   45.78    0.976  0.30( 0.30) 1.00    1653.8   12400.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1019.53  Tc(MIN.) =   40.89
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1543.95

****************************************************************************
 FLOW PROCESS FROM NODE  12423.00 TO NODE  12424.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    815.17  DOWNSTREAM(FEET) =    696.54
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2870.82   CHANNEL SLOPE =  0.0413
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```



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 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.98
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.981
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      122.40      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1057.05
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.64
 AVERAGE FLOW DEPTH(FEET) =   4.98   TRAVEL TIME(MIN.) =   4.50
 Tc(MIN.) =   45.38
 SUBAREA AREA(ACRES) =   122.40       SUBAREA RUNOFF(CFS) =   75.03
 EFFECTIVE AREA(ACRES) =   1666.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1776.2          PEAK FLOW RATE(CFS) =    1021.47
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.89

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.89   FLOW VELOCITY(FEET/SEC.) =  10.55
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12424.00 =   22007.16 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1021.47   45.38    0.981  0.30( 0.30) 1.00    1666.3   12410.00
     2     1006.72   50.30    0.924  0.30( 0.30) 1.00    1776.2   12400.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1021.47  Tc(MIN.) =   45.38
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1666.35

****************************************************************************
 FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    696.54  DOWNSTREAM(FEET) =    572.29
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3680.45   CHANNEL SLOPE =  0.0338
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.21
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.913
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       96.54      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1048.09
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.86
 AVERAGE FLOW DEPTH(FEET) =   5.21   TRAVEL TIME(MIN.) =   6.22
 Tc(MIN.) =   51.60
 SUBAREA AREA(ACRES) =    96.54       SUBAREA RUNOFF(CFS) =   53.23
```

```
  EFFECTIVE AREA(ACRES) =   1762.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1872.7         PEAK FLOW RATE(CFS) =    1021.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.14   FLOW VELOCITY(FEET/SEC.) =   9.80
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12425.00 =   25687.61 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1021.47   51.60    0.913  0.30( 0.30) 1.00    1762.9   12410.00
      2     1006.72   56.54    0.868  0.30( 0.30) 1.00    1872.7   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1021.47  Tc(MIN.) =   51.60
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1762.89
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1872.7  TC(MIN.) =     51.60
  EFFECTIVE AREA(ACRES) =   1762.89  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1021.47

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1021.47   51.60    0.913  0.30( 0.30) 1.00    1762.9   12410.00
      2     1006.72   56.54    0.868  0.30( 0.30) 1.00    1872.7   12400.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S25.DAT
  TIME/DATE OF STUDY: 13:50 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.938
   2)   10.00;  2.607
   3)   15.00;  1.899
   4)   20.00;  1.626
   5)   25.00;  1.416
   6)   30.00;  1.268
   7)   40.00;  1.087
   8)   50.00;  0.969
   9)   60.00;  0.882
  10)   90.00;  0.736
  11)  120.00;  0.654
  12)  180.00;  0.550
  13)  360.00;  0.410
  14) 1440.00;  0.181
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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**************************************************************************
  FLOW PROCESS FROM NODE  12500.00 TO NODE  12501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   927.04
  ELEVATION DATA: UPSTREAM(FEET) =   1638.22  DOWNSTREAM(FEET) =   1356.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.770
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.073
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        8.89      0.30     1.000     0   13.77
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     14.19
  TOTAL AREA(ACRES) =      8.89   PEAK FLOW RATE(CFS) =     14.19

**************************************************************************
  FLOW PROCESS FROM NODE  12501.00 TO NODE  12502.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1356.00  DOWNSTREAM(FEET) =   1203.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1004.73   CHANNEL SLOPE =  0.1519
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.805
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       24.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.67
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   16.73
  SUBAREA AREA(ACRES) =    24.30       SUBAREA RUNOFF(CFS) =   32.92
  EFFECTIVE AREA(ACRES) =     33.19     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.2          PEAK FLOW RATE(CFS) =      44.96
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   6.44
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12502.00 =    1931.77 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12502.00 TO NODE  12503.00 IS CODE =  56
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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1203.37  DOWNSTREAM(FEET) =    987.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.62   CHANNEL SLOPE =  0.1147
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.591
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      97.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.64
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   4.11
  Tc(MIN.) =   20.84
  SUBAREA AREA(ACRES) =    90.42       SUBAREA RUNOFF(CFS) =  105.08
  EFFECTIVE AREA(ACRES) =    123.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      123.6         PEAK FLOW RATE(CFS) =     143.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   8.65
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12503.00 =    3816.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12503.00 TO NODE  12504.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    987.23  DOWNSTREAM(FEET) =    870.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1478.57   CHANNEL SLOPE =  0.0792
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.72
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.466
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     187.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.26
  AVERAGE FLOW DEPTH(FEET) =   1.70   TRAVEL TIME(MIN.) =   2.98
  Tc(MIN.) =   23.82
  SUBAREA AREA(ACRES) =    84.07       SUBAREA RUNOFF(CFS) =   88.22
  EFFECTIVE AREA(ACRES) =    207.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.7         PEAK FLOW RATE(CFS) =     217.93
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.84   FLOW VELOCITY(FEET/SEC.) =   8.65
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12504.00 =    5294.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12504.00 TO NODE  12505.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.07  DOWNSTREAM(FEET) =    729.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1915.52   CHANNEL SLOPE =  0.0736
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.344
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     255.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.84
  AVERAGE FLOW DEPTH(FEET) =   2.05   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =   27.43
  SUBAREA AREA(ACRES) =    79.84       SUBAREA RUNOFF(CFS) =   75.02
  EFFECTIVE AREA(ACRES) =    287.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      287.5         PEAK FLOW RATE(CFS) =     270.18
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.12   FLOW VELOCITY(FEET/SEC.) =   8.97
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12505.00 =    7210.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    729.02  DOWNSTREAM(FEET) =    549.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2961.35   CHANNEL SLOPE =  0.0605
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.211
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.77      0.30     1.000     -
```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 302.50
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.66
AVERAGE FLOW DEPTH(FEET) = 2.37 TRAVEL TIME(MIN.) = 5.70
Tc(MIN.) = 33.13
SUBAREA AREA(ACRES) = 78.77 SUBAREA RUNOFF(CFS) = 64.61
EFFECTIVE AREA(ACRES) = 366.29 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 366.3 PEAK FLOW RATE(CFS) = 300.42
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.36 FLOW VELOCITY(FEET/SEC.) = 8.65
LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

****
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 10

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==

****
FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: S23.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3612.16	46.29	0.30(0.29)	0.97	4254.7	12300.00
2	3666.33	48.13	0.30(0.29)	0.97	4500.4	12330.00
3	4002.46	62.09	0.30(0.29)	0.97	6234.8	12211.00
4	4079.02	67.07	0.30(0.29)	0.97	6849.1	12201.00
5	4038.21	71.97	0.30(0.29)	0.97	7338.2	12111.00
6	4054.93	75.42	0.30(0.29)	0.97	7716.9	12231.00
7	4041.99	78.19	0.30(0.29)	0.97	7984.1	12101.10
8	4028.52	79.48	0.30(0.29)	0.97	8095.5	12261.00
9	3739.69	92.37	0.30(0.29)	0.97	8897.3	12010.00
10	3455.52	100.42	0.30(0.29)	0.97	9014.4	12000.00

TOTAL AREA(ACRES) = 9014.4

****
FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: S24.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1021.47	51.60	0.30(0.30)	1.00	1762.9	12410.00
2	1006.72	56.54	0.30(0.30)	1.00	1872.7	12400.00

TOTAL AREA(ACRES) = 1872.7

****
FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 14.0

>>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1021.47	51.60	0.30(0.30)	1.00	1762.9	12410.00
2	1006.72	56.54	0.30(0.30)	1.00	1872.7	12400.00

TOTAL AREA(ACRES) = 1872.7

****
FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1021.47	51.60	0.955	0.30(0.30)	1.00	1762.9	12410.00
2	1006.72	56.54	0.912	0.30(0.30)	1.00	1872.7	12400.00

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3612.16	46.29	1.013	0.30(0.29)	0.97	4254.7	12300.00
2	3666.33	48.13	0.991	0.30(0.29)	0.97	4500.4	12330.00
3	4002.46	62.09	0.872	0.30(0.29)	0.97	6234.8	12211.00
4	4079.02	67.07	0.848	0.30(0.29)	0.97	6849.1	12201.00
5	4038.21	71.97	0.824	0.30(0.29)	0.97	7338.2	12111.00
6	4054.93	75.42	0.807	0.30(0.29)	0.97	7716.9	12231.00
7	4041.99	78.19	0.794	0.30(0.29)	0.97	7984.1	12101.10
8	4028.52	79.48	0.787	0.30(0.29)	0.97	8095.5	12261.00
9	3739.69	92.37	0.729	0.30(0.29)	0.97	8897.3	12010.00
10	3455.52	100.42	0.707	0.30(0.29)	0.97	9014.4	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4609.31	46.29	1.013	0.30(0.29)	0.98	5836.1	12300.00
2	4671.46	48.13	0.991	0.30(0.29)	0.98	6144.6	12330.00
3	4771.42	51.60	0.955	0.30(0.29)	0.98	6694.8	12410.00
4	4875.50	56.54	0.912	0.30(0.29)	0.98	7417.7	12400.00
5	4943.00	62.09	0.872	0.30(0.29)	0.98	8107.5	12211.00
6	4979.63	67.07	0.848	0.30(0.29)	0.98	8721.8	12201.00
7	4899.54	71.97	0.824	0.30(0.29)	0.97	9210.9	12111.00
8	4888.52	75.42	0.807	0.30(0.29)	0.97	9589.6	12231.00
9	4853.43	78.19	0.794	0.30(0.29)	0.97	9856.8	12101.10
10	4829.59	79.48	0.787	0.30(0.29)	0.97	9968.2	12261.00
11	4445.74	92.37	0.729	0.30(0.29)	0.98	10770.0	12010.00
12	4125.34	100.42	0.707	0.30(0.29)	0.98	10887.1	12000.00

TOTAL AREA(ACRES) = 10887.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4979.63 Tc(MIN.) = 67.068
EFFECTIVE AREA(ACRES) = 8721.76 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 10887.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

****
FLOW PROCESS FROM NODE 12425.00 TO NODE 12520.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 572.29 DOWNSTREAM(FEET) = 549.92
CHANNEL LENGTH THRU SUBAREA(FEET) = 1724.25 CHANNEL SLOPE = 0.0130
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.66
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.832
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.96	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5007.88
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.97
AVERAGE FLOW DEPTH(FEET) = 7.65 TRAVEL TIME(MIN.) = 3.20
Tc(MIN.) = 70.27
SUBAREA AREA(ACRES) = 117.96 SUBAREA RUNOFF(CFS) = 56.50
EFFECTIVE AREA(ACRES) = 8839.72 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11005.0 PEAK FLOW RATE(CFS) = 4979.63
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.63 FLOW VELOCITY(FEET/SEC.) = 8.96
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4609.31	49.56	0.974	0.30(0.29)	0.98	5954.1	12300.00
2	4671.46	51.39	0.957	0.30(0.29)	0.98	6262.6	12330.00
3	4771.42	54.84	0.927	0.30(0.29)	0.98	6812.7	12410.00
4	4875.50	59.76	0.884	0.30(0.29)	0.98	7535.7	12400.00
5	4943.00	65.30	0.856	0.30(0.29)	0.98	8225.5	12211.00
6	4979.63	70.27	0.832	0.30(0.29)	0.98	8839.7	12201.00
7	4899.54	75.18	0.808	0.30(0.29)	0.97	9328.9	12111.00
8	4888.52	78.64	0.791	0.30(0.29)	0.97	9707.5	12231.00
9	4853.43	81.41	0.778	0.30(0.29)	0.97	9974.7	12101.10
10	4829.59	82.71	0.771	0.30(0.29)	0.97	10086.1	12261.00
11	4445.74	95.68	0.720	0.30(0.29)	0.98	10888.0	12010.00
12	4125.34	103.80	0.698	0.30(0.29)	0.98	11005.0	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 4979.63 Tc(MIN.) = 70.27
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 8839.72

****
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4609.31	49.56	0.974	0.30(0.29)	0.98	5954.1	12300.00
2	4671.46	51.39	0.957	0.30(0.29)	0.98	6262.6	12330.00
3	4771.42	54.84	0.927	0.30(0.29)	0.98	6812.7	12410.00
4	4875.50	59.76	0.884	0.30(0.29)	0.98	7535.7	12400.00
5	4943.00	65.30	0.856	0.30(0.29)	0.98	8225.5	12211.00
6	4979.63	70.27	0.832	0.30(0.29)	0.98	8839.7	12201.00
7	4899.54	75.18	0.808	0.30(0.29)	0.97	9328.9	12111.00
8	4888.52	78.64	0.791	0.30(0.29)	0.97	9707.5	12231.00
9	4853.43	81.41	0.778	0.30(0.29)	0.97	9974.7	12101.10
10	4829.59	82.71	0.771	0.30(0.29)	0.97	10086.1	12261.00
11	4445.74	95.68	0.720	0.30(0.29)	0.98	10888.0	12010.00
12	4125.34	103.80	0.698	0.30(0.29)	0.98	11005.0	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	300.42	33.13	1.211	0.30(0.30)	1.00	366.3	12500.00

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4455.40	33.13	1.211	0.30(0.29)	0.98	4346.3	12500.00
2	4831.61	49.56	0.974	0.30(0.29)	0.98	6320.4	12300.00
3	4888.08	51.39	0.957	0.30(0.29)	0.98	6628.9	12330.00
4	4978.16	54.84	0.927	0.30(0.29)	0.98	7179.0	12410.00
5	5068.17	59.76	0.884	0.30(0.29)	0.98	7902.0	12400.00
6	5126.45	65.30	0.856	0.30(0.29)	0.98	8591.8	12211.00
7	5155.09	70.27	0.832	0.30(0.29)	0.98	9206.0	12201.00
8	5067.10	75.18	0.808	0.30(0.29)	0.98	9695.1	12111.00
9	5050.51	78.64	0.791	0.30(0.29)	0.98	10073.8	12231.00
10	5010.97	81.41	0.778	0.30(0.29)	0.97	10341.0	12101.10
11	4985.03	82.71	0.771	0.30(0.29)	0.97	10452.4	12261.00
12	4584.34	95.68	0.720	0.30(0.29)	0.98	11254.3	12010.00
13	4256.60	103.80	0.698	0.30(0.29)	0.98	11371.3	12000.00

TOTAL AREA(ACRES) = 11371.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5155.09 Tc(MIN.) = 70.270
EFFECTIVE AREA(ACRES) = 9206.01 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11371.3
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

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  FLOW PROCESS FROM NODE  12520.00 TO NODE  12521.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    549.92  DOWNSTREAM(FEET) =    525.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1934.41   CHANNEL SLOPE =  0.0127
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.84
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.815
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5174.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.98
  AVERAGE FLOW DEPTH(FEET) =   7.84   TRAVEL TIME(MIN.) =   3.59
  Tc(MIN.) =   73.86
  SUBAREA AREA(ACRES) =    85.91       SUBAREA RUNOFF(CFS) =   39.80
  EFFECTIVE AREA(ACRES) =   9291.92     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    11457.2         PEAK FLOW RATE(CFS) =    5155.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.82   FLOW VELOCITY(FEET/SEC.) =   8.97
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12521.00 =   60159.12 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4455.40   36.87    1.144  0.30( 0.29) 0.98    4432.2   12500.00
      2     4831.61   53.22    0.941  0.30( 0.29) 0.98    6406.3   12300.00
      3     4888.08   55.03    0.925  0.30( 0.29) 0.98    6714.8   12330.00
      4     4978.16   58.47    0.896  0.30( 0.29) 0.98    7264.9   12410.00
      5     5068.17   63.37    0.866  0.30( 0.29) 0.98    7987.9   12400.00
      6     5126.45   68.89    0.839  0.30( 0.29) 0.98    8677.7   12211.00
      7     5155.09   73.86    0.815  0.30( 0.29) 0.98    9291.9   12201.00
      8     5067.10   78.79    0.791  0.30( 0.29) 0.98    9781.1   12111.00
      9     5050.51   82.25    0.774  0.30( 0.29) 0.98   10159.7   12231.00
     10     5010.97   85.03    0.760  0.30( 0.29) 0.97   10426.9   12101.10
     11     4985.03   86.34    0.754  0.30( 0.29) 0.97   10538.3   12261.00
     12     4584.34   99.40    0.710  0.30( 0.29) 0.98   11340.2   12010.00
     13     4256.60  107.60    0.688  0.30( 0.29) 0.98   11457.2   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5155.09  Tc(MIN.) =   73.86
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    9291.92

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  FLOW PROCESS FROM NODE  12521.00 TO NODE  12522.00 IS CODE =  56
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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    525.43  DOWNSTREAM(FEET) =    490.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3335.01   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.38
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.782
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      539.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5272.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.41
  AVERAGE FLOW DEPTH(FEET) =   8.35   TRAVEL TIME(MIN.) =   6.61
  Tc(MIN.) =   80.47
  SUBAREA AREA(ACRES) =   539.82       SUBAREA RUNOFF(CFS) =  234.42
  EFFECTIVE AREA(ACRES) =   9831.74     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    11997.0         PEAK FLOW RATE(CFS) =    5155.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.25   FLOW VELOCITY(FEET/SEC.) =   8.36
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12522.00 =   63494.13 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4455.40   43.73    1.043  0.30( 0.30) 0.99    4972.0   12500.00
      2     4831.61   59.94    0.883  0.30( 0.30) 0.98    6946.1   12300.00
      3     4888.08   61.73    0.874  0.30( 0.30) 0.98    7254.6   12330.00
      4     4978.16   65.13    0.857  0.30( 0.29) 0.98    7804.8   12410.00
      5     5068.17   70.00    0.833  0.30( 0.29) 0.98    8527.7   12400.00
      6     5126.45   75.51    0.807  0.30( 0.29) 0.98    9217.5   12211.00
      7     5155.09   80.47    0.782  0.30( 0.29) 0.98    9831.7   12201.00
      8     5067.10   85.43    0.758  0.30( 0.29) 0.98   10320.9   12111.00
      9     5050.51   88.90    0.741  0.30( 0.29) 0.98   10699.6   12231.00
     10     5010.97   91.70    0.731  0.30( 0.29) 0.98   10966.7   12101.10
     11     4985.03   93.02    0.728  0.30( 0.29) 0.98   11078.1   12261.00
     12     4584.34  106.24    0.691  0.30( 0.29) 0.98   11880.0   12010.00
     13     4256.60  114.60    0.669  0.30( 0.29) 0.98   11997.0   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5155.09  Tc(MIN.) =   80.47
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    9831.74

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  FLOW PROCESS FROM NODE  12522.00 TO NODE  12523.00 IS CODE =  56
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
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 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    490.87  DOWNSTREAM(FEET) =    467.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1961.26   CHANNEL SLOPE =  0.0118
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.03
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.764
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      321.58      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5222.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.80
 AVERAGE FLOW DEPTH(FEET) =   8.02   TRAVEL TIME(MIN.) =   3.72
 Tc(MIN.) =   84.18
 SUBAREA AREA(ACRES) =   321.58       SUBAREA RUNOFF(CFS) =  134.40
 EFFECTIVE AREA(ACRES) =  10153.32     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =    12318.6         PEAK FLOW RATE(CFS) =    5155.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.96

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.96   FLOW VELOCITY(FEET/SEC.) =   8.77
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12523.00 =   65455.39 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4455.40   47.60    0.997  0.30( 0.30) 0.99    5293.6   12500.00
     2     4831.61   63.72    0.864  0.30( 0.30) 0.98    7267.7   12300.00
     3     4888.08   65.50    0.855  0.30( 0.30) 0.98    7576.2   12330.00
     4     4978.16   68.88    0.839  0.30( 0.29) 0.98    8126.3   12410.00
     5     5068.17   73.73    0.815  0.30( 0.29) 0.98    8849.3   12400.00
     6     5126.45   79.22    0.788  0.30( 0.29) 0.98    9539.1   12211.00
     7     5155.09   84.18    0.764  0.30( 0.29) 0.98   10153.3   12201.00
     8     5067.10   89.17    0.740  0.30( 0.29) 0.98   10642.5   12111.00
     9     5050.51   92.64    0.729  0.30( 0.29) 0.98   11021.1   12231.00
    10     5010.97   95.45    0.721  0.30( 0.29) 0.98   11288.3   12101.10
    11     4985.03   96.77    0.717  0.30( 0.29) 0.98   11399.7   12261.00
    12     4584.34  110.08    0.681  0.30( 0.29) 0.98   12201.6   12010.00
    13     4256.60  118.53    0.658  0.30( 0.29) 0.98   12318.6   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    5155.09  Tc(MIN.) =   84.18
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10153.32

****************************************************************************
 FLOW PROCESS FROM NODE  12523.00 TO NODE  12524.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
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 ELEVATION DATA: UPSTREAM(FEET) =    467.63  DOWNSTREAM(FEET) =    436.35
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2841.85   CHANNEL SLOPE =  0.0110
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.18
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.737
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      298.62      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5213.87
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.57
 AVERAGE FLOW DEPTH(FEET) =   8.17   TRAVEL TIME(MIN.) =   5.53
 Tc(MIN.) =   89.71
 SUBAREA AREA(ACRES) =   298.62       SUBAREA RUNOFF(CFS) =  117.56
 EFFECTIVE AREA(ACRES) =  10451.94     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =    12617.2         PEAK FLOW RATE(CFS) =    5155.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.12

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.12   FLOW VELOCITY(FEET/SEC.) =   8.54
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12524.00 =   68297.24 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4455.40   53.36    0.940  0.30( 0.30) 0.99    5592.2   12500.00
     2     4831.61   69.35    0.837  0.30( 0.30) 0.99    7566.3   12300.00
     3     4888.08   71.11    0.828  0.30( 0.30) 0.98    7874.8   12330.00
     4     4978.16   74.47    0.812  0.30( 0.30) 0.98    8425.0   12410.00
     5     5068.17   79.29    0.788  0.30( 0.29) 0.98    9147.9   12400.00
     6     5126.45   84.76    0.761  0.30( 0.29) 0.98    9837.7   12211.00
     7     5155.09   89.71    0.737  0.30( 0.29) 0.98   10451.9   12201.00
     8     5067.10   94.72    0.723  0.30( 0.29) 0.98   10941.1   12111.00
     9     5050.51   98.20    0.713  0.30( 0.29) 0.98   11319.8   12231.00
    10     5010.97  101.02    0.706  0.30( 0.29) 0.98   11586.9   12101.10
    11     4985.03  102.35    0.702  0.30( 0.29) 0.98   11698.3   12261.00
    12     4584.34  115.81    0.665  0.30( 0.29) 0.98   12500.2   12010.00
    13     4256.60  124.37    0.646  0.30( 0.29) 0.98   12617.2   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    5155.09  Tc(MIN.) =   89.71
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10451.94

****************************************************************************
 FLOW PROCESS FROM NODE  12524.00 TO NODE  12525.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    436.35  DOWNSTREAM(FEET) =    415.23
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2812.14   CHANNEL SLOPE =  0.0075
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 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.04
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.720
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      251.20      0.30     0.997     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5202.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.48
 AVERAGE FLOW DEPTH(FEET) =   9.03   TRAVEL TIME(MIN.) =   6.27
 Tc(MIN.) =   95.98
 SUBAREA AREA(ACRES) =   251.20       SUBAREA RUNOFF(CFS) =   95.07
 EFFECTIVE AREA(ACRES) =  10703.14     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =    12868.4         PEAK FLOW RATE(CFS) =    5155.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.98

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.98   FLOW VELOCITY(FEET/SEC.) =   7.46
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12525.00 =   71109.38 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4455.40   59.88    0.883  0.30( 0.30) 0.99    5843.4   12500.00
     2     4831.61   75.73    0.806  0.30( 0.30) 0.99    7817.5   12300.00
     3     4888.08   77.48    0.797  0.30( 0.30) 0.99    8126.0   12330.00
     4     4978.16   80.79    0.781  0.30( 0.30) 0.98    8676.2   12410.00
     5     5068.17   85.59    0.757  0.30( 0.29) 0.98    9399.1   12400.00
     6     5126.45   91.04    0.733  0.30( 0.29) 0.98   10088.9   12211.00
     7     5155.09   95.98    0.720  0.30( 0.29) 0.98   10703.1   12201.00
     8     5067.10  101.02    0.706  0.30( 0.29) 0.98   11192.3   12111.00
     9     5050.51  104.51    0.696  0.30( 0.29) 0.98   11571.0   12231.00
    10     5010.97  107.35    0.688  0.30( 0.29) 0.98   11838.1   12101.10
    11     4985.03  108.69    0.685  0.30( 0.29) 0.98   11949.5   12261.00
    12     4584.34  122.29    0.650  0.30( 0.29) 0.98   12751.4   12010.00
    13     4256.60  131.01    0.635  0.30( 0.29) 0.98   12868.4   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    5155.09  Tc(MIN.) =   95.98
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10703.14

****************************************************************************
 FLOW PROCESS FROM NODE  12525.00 TO NODE  12526.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    415.23  DOWNSTREAM(FEET) =    380.28
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2934.09   CHANNEL SLOPE =  0.0119
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
```



```
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.61
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.702
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      247.71      0.30     0.987     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.987
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5200.33
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.58
 AVERAGE FLOW DEPTH(FEET) =   5.60   TRAVEL TIME(MIN.) =   6.45
 Tc(MIN.) =  102.43
 SUBAREA AREA(ACRES) =   247.71       SUBAREA RUNOFF(CFS) =   90.48
 EFFECTIVE AREA(ACRES) =  10950.85     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =    13116.2         PEAK FLOW RATE(CFS) =    5155.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.58

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.58   FLOW VELOCITY(FEET/SEC.) =   7.55
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12526.00 =   74043.48 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4455.40   66.65    0.850  0.30( 0.30) 0.99    6091.1   12500.00
     2     4831.61   82.32    0.773  0.30( 0.30) 0.99    8065.2   12300.00
     3     4888.08   84.04    0.765  0.30( 0.30) 0.99    8373.7   12330.00
     4     4978.16   87.32    0.749  0.30( 0.30) 0.98    8923.9   12410.00
     5     5068.17   92.08    0.730  0.30( 0.29) 0.98    9646.8   12400.00
     6     5126.45   97.51    0.715  0.30( 0.29) 0.98   10336.6   12211.00
     7     5155.09  102.43    0.702  0.30( 0.29) 0.98   10950.9   12201.00
     8     5067.10  107.52    0.688  0.30( 0.29) 0.98   11440.0   12111.00
     9     5050.51  111.01    0.678  0.30( 0.29) 0.98   11818.7   12231.00
    10     5010.97  113.86    0.671  0.30( 0.29) 0.98   12085.8   12101.10
    11     4985.03  115.21    0.667  0.30( 0.29) 0.98   12197.3   12261.00
    12     4584.34  129.01    0.638  0.30( 0.29) 0.98   12999.1   12010.00
    13     4256.60  137.88    0.623  0.30( 0.29) 0.98   13116.2   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    5155.09  Tc(MIN.) =  102.43
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10950.85

****************************************************************************
 FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    380.28  DOWNSTREAM(FEET) =    347.47
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3113.51   CHANNEL SLOPE =  0.0105
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.79
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.682
```

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	120.94	0.30	0.974	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.974
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   5176.32
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.26
AVERAGE FLOW DEPTH(FEET) =   5.79   TRAVEL TIME(MIN.) =   7.15
Tc(MIN.) = 109.58
SUBAREA AREA(ACRES) =   120.94   SUBAREA RUNOFF(CFS) =   42.47
EFFECTIVE AREA(ACRES) = 11071.79   AREA-AVERAGED Fm(INCH/HR) =   0.29
AREA-AVERAGED Fp(INCH/HR) =   0.30 AREA-AVERAGED Ap =   0.98
TOTAL AREA(ACRES) =   13237.1   PEAK FLOW RATE(CFS) =   5155.09
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00   CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   5.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.77   FLOW VELOCITY(FEET/SEC.) =   7.26
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 =   77156.98 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4455.40	74.14	0.813	0.30(0.30)	0.99	6212.1	12500.00
2	4831.61	89.62	0.738	0.30(0.30)	0.99	8186.2	12300.00
3	4888.08	91.31	0.732	0.30(0.30)	0.99	8494.7	12330.00
4	4978.16	94.55	0.723	0.30(0.30)	0.98	9044.8	12410.00
5	5068.17	99.26	0.711	0.30(0.29)	0.98	9767.8	12400.00
6	5126.45	104.66	0.696	0.30(0.29)	0.98	10457.5	12211.00
7	5155.09	109.58	0.682	0.30(0.29)	0.98	11071.8	12201.00
8	5067.10	114.70	0.668	0.30(0.29)	0.98	11560.9	12111.00
9	5050.51	118.20	0.659	0.30(0.29)	0.98	11939.6	12231.00
10	5010.97	121.07	0.652	0.30(0.29)	0.98	12206.8	12101.10
11	4985.03	122.44	0.650	0.30(0.29)	0.98	12318.2	12261.00
12	4584.34	136.43	0.625	0.30(0.29)	0.98	13120.1	12010.00
13	4256.60	145.49	0.610	0.30(0.29)	0.98	13237.1	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =   5155.09 Tc(MIN.) = 109.58
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) =   11071.79

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES)   =   13237.1 TC(MIN.) =   109.58
EFFECTIVE AREA(ACRES) = 11071.79 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.980
PEAK FLOW RATE(CFS)   =   5155.09

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4455.40	74.14	0.813	0.30(0.30)	0.99	6212.1	12500.00
2	4831.61	89.62	0.738	0.30(0.30)	0.99	8186.2	12300.00
3	4888.08	91.31	0.732	0.30(0.30)	0.99	8494.7	12330.00
4	4978.16	94.55	0.723	0.30(0.30)	0.98	9044.8	12410.00
5	5068.17	99.26	0.711	0.30(0.29)	0.98	9767.8	12400.00

6	5126.45	104.66	0.696	0.30(0.29)	0.98	10457.5	12211.00
7	5155.09	109.58	0.682	0.30(0.29)	0.98	11071.8	12201.00
8	5067.10	114.70	0.668	0.30(0.29)	0.98	11560.9	12111.00
9	5050.51	118.20	0.659	0.30(0.29)	0.98	11939.6	12231.00
10	5010.97	121.07	0.652	0.30(0.29)	0.98	12206.8	12101.10
11	4985.03	122.44	0.650	0.30(0.29)	0.98	12318.2	12261.00
12	4584.34	136.43	0.625	0.30(0.29)	0.98	13120.1	12010.00
13	4256.60	145.49	0.610	0.30(0.29)	0.98	13237.1	12000.00

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S26.DAT
  TIME/DATE OF STUDY: 08:56 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.911
   2)   10.00;  2.592
   3)   15.00;  1.893
   4)   20.00;  1.621
   5)   25.00;  1.412
   6)   30.00;  1.265
   7)   40.00;  1.084
   8)   50.00;  0.966
   9)   60.00;  0.879
  10)   90.00;  0.732
  11)  120.00;  0.650
  12)  180.00;  0.547
  13)  360.00;  0.406
  14) 1200.00;  0.179
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S19.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    13630.81   17.70  0.30( 0.30) 0.99    5434.4   40200.00
      2    16087.43   33.67  0.30( 0.30) 0.99   10443.5   40100.00
      3    17204.36   44.77  0.30( 0.30) 0.99   13709.7   11801.00
      4    18728.11   59.01  0.30( 0.30) 0.99   18702.4   11530.00
      5    19722.25   67.59  0.30( 0.30) 0.99   22567.5   11900.00
      6    21375.51   77.91  0.30( 0.30) 0.99   28400.7   11330.00
      7    22324.62   86.44  0.30( 0.30) 0.99   33485.3   10630.00
      8    22282.83   92.00  0.30( 0.30) 0.99   36079.1   12330.00
      9    22275.50   95.24  0.30( 0.30) 0.99   37670.3   12410.00
     10    22226.44   98.57  0.30( 0.30) 0.99   39217.8   11600.00
     11    22017.75  104.24  0.30( 0.30) 0.99   41450.2   11111.00
     12    21766.39  110.27  0.30( 0.30) 0.99   43386.4   12201.00
     13    21471.26  114.02  0.30( 0.30) 0.99   44335.4   10410.00
     14    21084.93  118.90  0.30( 0.30) 0.99   45474.1   12231.00
     15    20439.20  126.11  0.30( 0.30) 0.99   46887.5   10400.00
     16    20041.32  129.89  0.30( 0.30) 0.99   47477.5   10200.00
     17    19393.98  137.01  0.30( 0.30) 0.99   48504.6   10320.00
     18    18835.20  141.63  0.30( 0.30) 0.99   48732.5   10210.00
     19    18361.57  146.23  0.30( 0.30) 0.99   48894.0   12000.00
     20    15857.08  174.00  0.30( 0.30) 0.99   49511.8   10100.00
   TOTAL AREA(ACRES) =    49511.8

**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    13630.81   17.70  0.30( 0.30) 0.99    5434.4   40200.00
      2    16087.43   33.67  0.30( 0.30) 0.99   10443.5   40100.00
      3    17204.36   44.77  0.30( 0.30) 0.99   13709.7   11801.00
      4    18728.11   59.01  0.30( 0.30) 0.99   18702.4   11530.00
      5    19722.25   67.59  0.30( 0.30) 0.99   22567.5   11900.00
      6    21375.51   77.91  0.30( 0.30) 0.99   28400.7   11330.00
      7    22324.62   86.44  0.30( 0.30) 0.99   33485.3   10630.00
      8    22282.83   92.00  0.30( 0.30) 0.99   36079.1   12330.00
      9    22275.50   95.24  0.30( 0.30) 0.99   37670.3   12410.00
     10    22226.44   98.57  0.30( 0.30) 0.99   39217.8   11600.00
     11    22017.75  104.24  0.30( 0.30) 0.99   41450.2   11111.00
     12    21766.39  110.27  0.30( 0.30) 0.99   43386.4   12201.00
     13    21471.26  114.02  0.30( 0.30) 0.99   44335.4   10410.00
     14    21084.93  118.90  0.30( 0.30) 0.99   45474.1   12231.00
     15    20439.20  126.11  0.30( 0.30) 0.99   46887.5   10400.00
     16    20041.32  129.89  0.30( 0.30) 0.99   47477.5   10200.00
     17    19393.98  137.01  0.30( 0.30) 0.99   48504.6   10320.00
     18    18835.20  141.63  0.30( 0.30) 0.99   48732.5   10210.00
```

```
    19    18361.57  146.23  0.30( 0.30) 0.99   48894.0   12000.00
    20    15857.08  174.00  0.30( 0.30) 0.99   49511.8   10100.00
   TOTAL AREA(ACRES) =     49511.8

****************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  12601.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    341.63  DOWNSTREAM(FEET) =    325.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1467.93   CHANNEL SLOPE =  0.0113
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.04
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.742
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.11      0.30     0.992     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22327.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.06
  AVERAGE FLOW DEPTH(FEET) =   6.04   TRAVEL TIME(MIN.) =   1.52
  Tc(MIN.) =   87.96
  SUBAREA AREA(ACRES) =    14.11       SUBAREA RUNOFF(CFS) =    5.64
  EFFECTIVE AREA(ACRES) =  33499.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    49525.9         PEAK FLOW RATE(CFS) =   22324.62
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.04   FLOW VELOCITY(FEET/SEC.) =  16.06
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13630.81   19.51    1.648  0.30( 0.30) 0.99    5448.5   40200.00
      2    16087.43   35.38    1.168  0.30( 0.30) 0.99   10457.7   40100.00
      3    17204.36   46.44    1.008  0.30( 0.30) 0.99   13723.8   11801.00
      4    18728.11   60.63    0.876  0.30( 0.30) 0.99   18716.5   11530.00
      5    19722.25   69.18    0.834  0.30( 0.30) 0.99   22581.6   11900.00
      6    21375.51   79.46    0.784  0.30( 0.30) 0.99   28414.8   11330.00
      7    22324.62   87.96    0.742  0.30( 0.30) 0.99   33499.4   10630.00
      8    22282.83   93.53    0.722  0.30( 0.30) 0.99   36093.2   12330.00
      9    22275.50   96.76    0.714  0.30( 0.30) 0.99   37684.4   12410.00
     10    22226.44  100.10    0.704  0.30( 0.30) 0.99   39231.9   11600.00
     11    22017.75  105.77    0.689  0.30( 0.30) 0.99   41464.3   11111.00
     12    21766.39  111.81    0.672  0.30( 0.30) 0.99   43400.5   12201.00
     13    21471.26  115.57    0.662  0.30( 0.30) 0.99   44349.6   10410.00
     14    21084.93  120.46    0.649  0.30( 0.30) 0.99   45488.2   12231.00
     15    20439.20  127.68    0.637  0.30( 0.30) 0.99   46901.6   10400.00
     16    20041.32  131.47    0.630  0.30( 0.30) 0.99   47491.6   10200.00
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     17    19393.98  138.61    0.618  0.30( 0.30) 0.99   48518.8   10320.00
     18    18835.20  143.25    0.610  0.30( 0.30) 0.99   48746.6   10210.00
     19    18361.57  147.86    0.602  0.30( 0.30) 0.99   48908.1   12000.00
     20    15857.08  175.72    0.554  0.30( 0.30) 0.99   49525.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   22324.62  Tc(MIN.) =   87.96
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   33499.41

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610318V.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      142.37   17.56  0.30( 0.30) 1.00     108.8   31800.00
      2      136.14   21.20  0.30( 0.30) 1.00     119.0   31810.00
    TOTAL AREA(ACRES) =      119.0

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13630.81   19.51    1.648  0.30( 0.30) 0.99    5448.5   40200.00
      2    16087.43   35.38    1.168  0.30( 0.30) 0.99   10457.7   40100.00
      3    17204.36   46.44    1.008  0.30( 0.30) 0.99   13723.8   11801.00
      4    18728.11   60.63    0.876  0.30( 0.30) 0.99   18716.5   11530.00
      5    19722.25   69.18    0.834  0.30( 0.30) 0.99   22581.6   11900.00
      6    21375.51   79.46    0.784  0.30( 0.30) 0.99   28414.8   11330.00
      7    22324.62   87.96    0.742  0.30( 0.30) 0.99   33499.4   10630.00
      8    22282.83   93.53    0.722  0.30( 0.30) 0.99   36093.2   12330.00
      9    22275.50   96.76    0.714  0.30( 0.30) 0.99   37684.4   12410.00
     10    22226.44  100.10    0.704  0.30( 0.30) 0.99   39231.9   11600.00
     11    22017.75  105.77    0.689  0.30( 0.30) 0.99   41464.3   11111.00
     12    21766.39  111.81    0.672  0.30( 0.30) 0.99   43400.5   12201.00
     13    21471.26  115.57    0.662  0.30( 0.30) 0.99   44349.6   10410.00
     14    21084.93  120.46    0.649  0.30( 0.30) 0.99   45488.2   12231.00
     15    20439.20  127.68    0.637  0.30( 0.30) 0.99   46901.6   10400.00
     16    20041.32  131.47    0.630  0.30( 0.30) 0.99   47491.6   10200.00
     17    19393.98  138.61    0.618  0.30( 0.30) 0.99   48518.8   10320.00
     18    18835.20  143.25    0.610  0.30( 0.30) 0.99   48746.6   10210.00
     19    18361.57  147.86    0.602  0.30( 0.30) 0.99   48908.1   12000.00
     20    15857.08  175.72    0.554  0.30( 0.30) 0.99   49525.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      142.37   17.56    1.754  0.30( 0.30) 1.00     108.8   31800.00
      2      136.14   21.20    1.571  0.30( 0.30) 1.00     119.0   31810.00
```

LONGEST FLOWPATH FROM NODE 31810.00 TO NODE 12601.00 = 4599.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13375.95	17.56	1.754	0.30(0.30)	0.99	5014.0	31800.00
2	13769.85	19.51	1.648	0.30(0.30)	0.99	5562.8	40200.00
3	14028.27	21.20	1.571	0.30(0.30)	0.99	6100.4	31810.00
4	16180.37	35.38	1.168	0.30(0.30)	0.99	10576.7	40100.00
5	17280.20	46.44	1.008	0.30(0.30)	0.99	13842.8	11801.00
6	18789.80	60.63	0.876	0.30(0.30)	0.99	18835.6	11530.00
7	19779.45	69.18	0.834	0.30(0.30)	0.99	22700.7	11900.00
8	21427.32	79.46	0.784	0.30(0.30)	0.99	28533.8	11330.00
9	22371.97	87.96	0.742	0.30(0.30)	0.99	33618.4	10630.00
10	22328.08	93.53	0.722	0.30(0.30)	0.99	36212.2	12330.00
11	22319.80	96.76	0.714	0.30(0.30)	0.99	37803.4	12410.00
12	22269.76	100.10	0.704	0.30(0.30)	0.99	39350.9	11600.00
13	22059.41	105.77	0.689	0.30(0.30)	0.99	41583.3	11111.00
14	21806.29	111.81	0.672	0.30(0.30)	0.99	43519.5	12201.00
15	21510.05	115.57	0.662	0.30(0.30)	0.99	44468.6	10410.00
16	21122.34	120.46	0.649	0.30(0.30)	0.99	45607.2	12231.00
17	20475.28	127.68	0.637	0.30(0.30)	0.99	47020.6	10400.00
18	20076.70	131.47	0.630	0.30(0.30)	0.99	47610.7	10200.00
19	19428.05	138.61	0.618	0.30(0.30)	0.99	48637.8	10320.00
20	18868.42	143.25	0.610	0.30(0.30)	0.99	48865.7	10210.00
21	18393.95	147.86	0.602	0.30(0.30)	0.99	49027.1	12000.00
22	15884.33	175.72	0.554	0.30(0.30)	0.99	49644.9	10100.00

TOTAL AREA(ACRES) = 49644.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 22371.97 Tc(MIN.) = 87.963
EFFECTIVE AREA(ACRES) = 33618.43 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49644.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

****
FLOW PROCESS FROM NODE 12601.00 TO NODE 12602.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 325.00 DOWNSTREAM(FEET) = 313.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1377.46 CHANNEL SLOPE = 0.0087
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.53
CHANNEL FLOW THRU SUBAREA(CFS) = 22371.97
FLOW VELOCITY(FEET/SEC.) = 14.74 FLOW DEPTH(FEET) = 6.53
TRAVEL TIME(MIN.) = 1.56 Tc(MIN.) = 89.52
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12602.00 = 101245.91 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13375.95	19.43	1.652	0.30(0.30)	0.99	5014.0	31800.00
2	13769.85	21.35	1.564	0.30(0.30)	0.99	5562.8	40200.00
3	14028.27	23.03	1.494	0.30(0.30)	0.99	6100.4	31810.00

4	16180.37	37.12	1.136	0.30(0.30)	0.99	10576.7	40100.00
5	17280.20	48.14	0.988	0.30(0.30)	0.99	13842.8	11801.00
6	18789.80	62.29	0.868	0.30(0.30)	0.99	18835.6	11530.00
7	19779.45	70.81	0.826	0.30(0.30)	0.99	22700.7	11900.00
8	21427.32	81.04	0.776	0.30(0.30)	0.99	28533.8	11330.00
9	22371.97	89.52	0.734	0.30(0.30)	0.99	33618.4	10630.00
10	22328.08	95.09	0.718	0.30(0.30)	0.99	36212.2	12330.00
11	22319.80	98.32	0.709	0.30(0.30)	0.99	37803.4	12410.00
12	22269.76	101.66	0.700	0.30(0.30)	0.99	39350.9	11600.00
13	22059.41	107.34	0.685	0.30(0.30)	0.99	41583.3	11111.00
14	21806.29	113.38	0.668	0.30(0.30)	0.99	43519.5	12201.00
15	21510.05	117.14	0.658	0.30(0.30)	0.99	44468.6	10410.00
16	21122.34	122.05	0.646	0.30(0.30)	0.99	45607.2	12231.00
17	20475.28	129.29	0.634	0.30(0.30)	0.99	47020.6	10400.00
18	20076.70	133.09	0.628	0.30(0.30)	0.99	47610.7	10200.00
19	19428.05	140.25	0.615	0.30(0.30)	0.99	48637.8	10320.00
20	18868.42	144.90	0.607	0.30(0.30)	0.99	48865.7	10210.00
21	18393.95	149.52	0.599	0.30(0.30)	0.99	49027.1	12000.00
22	15884.33	177.47	0.551	0.30(0.30)	0.99	49644.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 22371.97 Tc(MIN.) = 89.52
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33618.43

****
FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 313.00 DOWNSTREAM(FEET) = 310.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 312.40 CHANNEL SLOPE = 0.0096
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.34
CHANNEL FLOW THRU SUBAREA(CFS) = 22371.97
FLOW VELOCITY(FEET/SEC.) = 15.22 FLOW DEPTH(FEET) = 6.34
TRAVEL TIME(MIN.) = 0.34 Tc(MIN.) = 89.86
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13375.95	19.83	1.630	0.30(0.30)	0.99	5014.0	31800.00
2	13769.85	21.76	1.548	0.30(0.30)	0.99	5562.8	40200.00
3	14028.27	23.43	1.478	0.30(0.30)	0.99	6100.4	31810.00
4	16180.37	37.50	1.129	0.30(0.30)	0.99	10576.7	40100.00
5	17280.20	48.52	0.984	0.30(0.30)	0.99	13842.8	11801.00
6	18789.80	62.65	0.866	0.30(0.30)	0.99	18835.6	11530.00
7	19779.45	71.16	0.824	0.30(0.30)	0.99	22700.7	11900.00
8	21427.32	81.39	0.774	0.30(0.30)	0.99	28533.8	11330.00
9	22371.97	89.86	0.733	0.30(0.30)	0.99	33618.4	10630.00
10	22328.08	95.43	0.717	0.30(0.30)	0.99	36212.2	12330.00
11	22319.80	98.66	0.708	0.30(0.30)	0.99	37803.4	12410.00
12	22269.76	102.00	0.699	0.30(0.30)	0.99	39350.9	11600.00
13	22059.41	107.68	0.684	0.30(0.30)	0.99	41583.3	11111.00
14	21806.29	113.72	0.667	0.30(0.30)	0.99	43519.5	12201.00
15	21510.05	117.49	0.657	0.30(0.30)	0.99	44468.6	10410.00

```
    16    21122.34  122.40    0.646  0.30( 0.30) 0.99   45607.2   12231.00
    17    20475.28  129.64    0.633  0.30( 0.30) 0.99   47020.6   10400.00
    18    20076.70  133.44    0.627  0.30( 0.30) 0.99   47610.7   10200.00
    19    19428.05  140.61    0.615  0.30( 0.30) 0.99   48637.8   10320.00
    20    18868.42  145.26    0.607  0.30( 0.30) 0.99   48865.7   10210.00
    21    18393.95  149.89    0.599  0.30( 0.30) 0.99   49027.1   12000.00
    22    15884.33  177.86    0.551  0.30( 0.30) 0.99   49644.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   22371.97  Tc(MIN.) =   89.86
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   33618.43

****************************************************************************
  FLOW PROCESS FROM NODE  12602.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610317V.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       83.43   17.15  0.30( 0.30) 1.00      62.8   31700.00
      2       82.02   21.01  0.30( 0.30) 1.00      71.3   31710.00
    TOTAL AREA(ACRES) =       71.3

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13375.95   19.83    1.630  0.30( 0.30) 0.99    5014.0   31800.00
      2    13769.85   21.76    1.548  0.30( 0.30) 0.99    5562.8   40200.00
      3    14028.27   23.43    1.478  0.30( 0.30) 0.99    6100.4   31810.00
      4    16180.37   37.50    1.129  0.30( 0.30) 0.99   10576.7   40100.00
      5    17280.20   48.52    0.984  0.30( 0.30) 0.99   13842.8   11801.00
      6    18789.80   62.65    0.866  0.30( 0.30) 0.99   18835.6   11530.00
      7    19779.45   71.16    0.824  0.30( 0.30) 0.99   22700.7   11900.00
      8    21427.32   81.39    0.774  0.30( 0.30) 0.99   28533.8   11330.00
      9    22371.97   89.86    0.733  0.30( 0.30) 0.99   33618.4   10630.00
     10    22328.08   95.43    0.717  0.30( 0.30) 0.99   36212.2   12330.00
     11    22319.80   98.66    0.708  0.30( 0.30) 0.99   37803.4   12410.00
     12    22269.76  102.00    0.699  0.30( 0.30) 0.99   39350.9   11600.00
     13    22059.41  107.68    0.684  0.30( 0.30) 0.99   41583.3   11111.00
     14    21806.29  113.72    0.667  0.30( 0.30) 0.99   43519.5   12201.00
     15    21510.05  117.49    0.657  0.30( 0.30) 0.99   44468.6   10410.00
     16    21122.34  122.40    0.646  0.30( 0.30) 0.99   45607.2   12231.00
     17    20475.28  129.64    0.633  0.30( 0.30) 0.99   47020.6   10400.00
     18    20076.70  133.44    0.627  0.30( 0.30) 0.99   47610.7   10200.00
```



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    19    19428.05  140.61    0.615  0.30( 0.30) 0.99   48637.8   10320.00
    20    18868.42  145.26    0.607  0.30( 0.30) 0.99   48865.7   10210.00
    21    18393.95  149.89    0.599  0.30( 0.30) 0.99   49027.1   12000.00
    22    15884.33  177.86    0.551  0.30( 0.30) 0.99   49644.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       83.43   17.15    1.776  0.30( 0.30) 1.00      62.8   31700.00
      2       82.02   21.01    1.579  0.30( 0.30) 1.00      71.3   31710.00
  LONGEST FLOWPATH FROM NODE  31710.00 TO NODE  12603.00 =    3633.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12915.87   17.15    1.776  0.30( 0.30) 0.99    4397.2   31700.00
      2    13458.40   19.83    1.630  0.30( 0.30) 0.99    5082.7   31800.00
      3    13698.44   21.01    1.579  0.30( 0.30) 0.99    5420.3   31710.00
      4    13849.86   21.76    1.548  0.30( 0.30) 0.99    5634.1   40200.00
      5    14103.80   23.43    1.478  0.30( 0.30) 0.99    6171.7   31810.00
      6    16233.55   37.50    1.129  0.30( 0.30) 0.99   10648.0   40100.00
      7    17324.04   48.52    0.984  0.30( 0.30) 0.99   13914.1   11801.00
      8    18826.11   62.65    0.866  0.30( 0.30) 0.99   18906.8   11530.00
      9    19813.08   71.16    0.824  0.30( 0.30) 0.99   22771.9   11900.00
     10    21457.74   81.39    0.774  0.30( 0.30) 0.99   28605.1   11330.00
     11    22399.72   89.86    0.733  0.30( 0.30) 0.99   33689.7   10630.00
     12    22354.84   95.43    0.717  0.30( 0.30) 0.99   36283.5   12330.00
     13    22345.99   98.66    0.708  0.30( 0.30) 0.99   37874.7   12410.00
     14    22295.37  102.00    0.699  0.30( 0.30) 0.99   39422.2   11600.00
     15    22084.02  107.68    0.684  0.30( 0.30) 0.99   41654.6   11111.00
     16    21829.84  113.72    0.667  0.30( 0.30) 0.99   43590.8   12201.00
     17    21532.95  117.49    0.657  0.30( 0.30) 0.99   44539.8   10410.00
     18    21144.53  122.40    0.646  0.30( 0.30) 0.99   45678.5   12231.00
     19    20496.67  129.64    0.633  0.30( 0.30) 0.99   47091.9   10400.00
     20    20097.67  133.44    0.627  0.30( 0.30) 0.99   47681.9   10200.00
     21    19448.23  140.61    0.615  0.30( 0.30) 0.99   48709.0   10320.00
     22    18888.09  145.26    0.607  0.30( 0.30) 0.99   48936.9   10210.00
     23    18413.11  149.89    0.599  0.30( 0.30) 0.99   49098.4   12000.00
     24    15900.41  177.86    0.551  0.30( 0.30) 0.99   49716.2   10100.00
    TOTAL AREA(ACRES) =     49716.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    22399.72  Tc(MIN.) =   89.863
  EFFECTIVE AREA(ACRES) =  33689.70  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49716.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
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```
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610403V.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1       210.14   19.95  0.30( 0.29) 0.97      175.0   40300.00
    TOTAL AREA(ACRES) =       175.0

********************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     12915.87   17.15    1.776  0.30( 0.30) 0.99     4397.2   31700.00
      2     13458.40   19.83    1.630  0.30( 0.30) 0.99     5082.7   31800.00
      3     13698.44   21.01    1.579  0.30( 0.30) 0.99     5420.3   31710.00
      4     13849.86   21.76    1.548  0.30( 0.30) 0.99     5634.1   40200.00
      5     14103.80   23.43    1.478  0.30( 0.30) 0.99     6171.7   31810.00
      6     16233.55   37.50    1.129  0.30( 0.30) 0.99    10648.0   40100.00
      7     17324.04   48.52    0.984  0.30( 0.30) 0.99    13914.1   11801.00
      8     18826.11   62.65    0.866  0.30( 0.30) 0.99    18906.8   11530.00
      9     19813.08   71.16    0.824  0.30( 0.30) 0.99    22771.9   11900.00
     10     21457.74   81.39    0.774  0.30( 0.30) 0.99    28605.1   11330.00
     11     22399.72   89.86    0.733  0.30( 0.30) 0.99    33689.7   10630.00
     12     22354.84   95.43    0.717  0.30( 0.30) 0.99    36283.5   12330.00
     13     22345.99   98.66    0.708  0.30( 0.30) 0.99    37874.7   12410.00
     14     22295.37  102.00    0.699  0.30( 0.30) 0.99    39422.2   11600.00
     15     22084.02  107.68    0.684  0.30( 0.30) 0.99    41654.6   11111.00
     16     21829.84  113.72    0.667  0.30( 0.30) 0.99    43590.8   12201.00
     17     21532.95  117.49    0.657  0.30( 0.30) 0.99    44539.8   10410.00
     18     21144.53  122.40    0.646  0.30( 0.30) 0.99    45678.5   12231.00
     19     20496.67  129.64    0.633  0.30( 0.30) 0.99    47091.9   10400.00
     20     20097.67  133.44    0.627  0.30( 0.30) 0.99    47681.9   10200.00
     21     19448.23  140.61    0.615  0.30( 0.30) 0.99    48709.0   10320.00
     22     18888.09  145.26    0.607  0.30( 0.30) 0.99    48936.9   10210.00
     23     18413.11  149.89    0.599  0.30( 0.30) 0.99    49098.4   12000.00
     24     15900.41  177.86    0.551  0.30( 0.30) 0.99    49716.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      210.14   19.95    1.624  0.30( 0.29) 0.97      175.0   40300.00
  LONGEST FLOWPATH FROM NODE  40300.00 TO NODE  12603.00 =    5256.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     13117.11   17.15    1.776  0.30( 0.30) 0.99     4547.6   31700.00
      2     13668.30   19.83    1.630  0.30( 0.30) 0.99     5256.7   31800.00
      3     13692.90   19.95    1.624  0.30( 0.30) 0.99     5292.0   40300.00
      4     13901.54   21.01    1.579  0.30( 0.30) 0.99     5595.4   31710.00
      5     14048.03   21.76    1.548  0.30( 0.30) 0.99     5809.1   40200.00
```



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      6     14290.95   23.43    1.478  0.30( 0.30) 0.99     6346.7   31810.00
      7     16365.82   37.50    1.129  0.30( 0.30) 0.99    10823.0   40100.00
      8     17433.37   48.52    0.984  0.30( 0.30) 0.99    14089.1   11801.00
      9     18916.92   62.65    0.866  0.30( 0.30) 0.99    19081.9   11530.00
     10     19897.33   71.16    0.824  0.30( 0.30) 0.99    22947.0   11900.00
     11     21534.09   81.39    0.774  0.30( 0.30) 0.99    28780.2   11330.00
     12     22469.53   89.86    0.733  0.30( 0.30) 0.99    33864.8   10630.00
     13     22422.20   95.43    0.717  0.30( 0.30) 0.99    36458.6   12330.00
     14     22411.96   98.66    0.708  0.30( 0.30) 0.99    38049.7   12410.00
     15     22359.91  102.00    0.699  0.30( 0.30) 0.99    39597.2   11600.00
     16     22146.11  107.68    0.684  0.30( 0.30) 0.99    41829.6   11111.00
     17     21889.33  113.72    0.667  0.30( 0.30) 0.99    43765.9   12201.00
     18     21590.81  117.49    0.657  0.30( 0.30) 0.99    44714.9   10410.00
     19     21200.67  122.40    0.646  0.30( 0.30) 0.99    45853.6   12231.00
     20     20550.85  129.64    0.633  0.30( 0.30) 0.99    47266.9   10400.00
     21     20150.82  133.44    0.627  0.30( 0.30) 0.99    47857.0   10200.00
     22     19499.45  140.61    0.615  0.30( 0.30) 0.99    48884.1   10320.00
     23     18938.04  145.26    0.607  0.30( 0.30) 0.99    49112.0   10210.00
     24     18461.81  149.89    0.599  0.30( 0.30) 0.99    49273.4   12000.00
     25     15941.56  177.86    0.551  0.30( 0.30) 0.99    49891.2   10100.00
   TOTAL AREA(ACRES) =     49891.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    22469.53  Tc(MIN.) =   89.863
  EFFECTIVE AREA(ACRES) =  33864.75  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49891.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12604.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    310.00  DOWNSTREAM(FEET) =    307.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.69   CHANNEL SLOPE =  0.0065
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.11
  CHANNEL FLOW THRU SUBAREA(CFS) =   22469.53
  FLOW VELOCITY(FEET/SEC.) =  13.42   FLOW DEPTH(FEET) =   7.11
  TRAVEL TIME(MIN.) =   0.57   Tc(MIN.) =   90.43
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12604.00 =  102017.99 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     13117.11   17.83    1.739  0.30( 0.30) 0.99     4547.6   31700.00
      2     13668.30   20.51    1.600  0.30( 0.30) 0.99     5256.7   31800.00
      3     13692.90   20.63    1.595  0.30( 0.30) 0.99     5292.0   40300.00
      4     13901.54   21.68    1.551  0.30( 0.30) 0.99     5595.4   31710.00
      5     14048.03   22.43    1.519  0.30( 0.30) 0.99     5809.1   40200.00
      6     14290.95   24.10    1.450  0.30( 0.30) 0.99     6346.7   31810.00
      7     16365.82   38.14    1.118  0.30( 0.30) 0.99    10823.0   40100.00
      8     17433.37   49.14    0.976  0.30( 0.30) 0.99    14089.1   11801.00
      9     18916.92   63.26    0.863  0.30( 0.30) 0.99    19081.9   11530.00
     10     19897.33   71.76    0.821  0.30( 0.30) 0.99    22947.0   11900.00
```

11	21534.09	81.97	0.771	0.30(0.30)	0.99	28780.2	11330.00
12	22469.53	90.43	0.731	0.30(0.30)	0.99	33864.8	10630.00
13	22422.20	96.00	0.716	0.30(0.30)	0.99	36458.6	12330.00
14	22411.96	99.23	0.707	0.30(0.30)	0.99	38049.7	12410.00
15	22359.91	102.57	0.698	0.30(0.30)	0.99	39597.2	11600.00
16	22146.11	108.26	0.682	0.30(0.30)	0.99	41829.6	11111.00
17	21889.33	114.30	0.666	0.30(0.30)	0.99	43765.9	12201.00
18	21590.81	118.07	0.655	0.30(0.30)	0.99	44714.9	10410.00
19	21200.67	122.98	0.645	0.30(0.30)	0.99	45853.6	12231.00
20	20550.85	130.23	0.632	0.30(0.30)	0.99	47266.9	10400.00
21	20150.82	134.04	0.626	0.30(0.30)	0.99	47857.0	10200.00
22	19499.45	141.21	0.614	0.30(0.30)	0.99	48884.1	10320.00
23	18938.04	145.87	0.606	0.30(0.30)	0.99	49112.0	10210.00
24	18461.81	150.50	0.598	0.30(0.30)	0.99	49273.4	12000.00
25	15941.56	178.50	0.550	0.30(0.30)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 22469.53 Tc(MIN.) = 90.43
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33864.75

****
FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 307.00 DOWNSTREAM(FEET) = 305.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 427.54 CHANNEL SLOPE = 0.0047
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.82
CHANNEL FLOW THRU SUBAREA(CFS) = 22469.53
FLOW VELOCITY(FEET/SEC.) = 12.02 FLOW DEPTH(FEET) = 7.82
TRAVEL TIME(MIN.) = 0.59 Tc(MIN.) = 91.03
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.00 = 102445.53 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13117.11	18.55	1.700	0.30(0.30)	0.99	4547.6	31700.00
2	13668.30	21.21	1.570	0.30(0.30)	0.99	5256.7	31800.00
3	13692.90	21.33	1.565	0.30(0.30)	0.99	5292.0	40300.00
4	13901.54	22.38	1.522	0.30(0.30)	0.99	5595.4	31710.00
5	14048.03	23.12	1.490	0.30(0.30)	0.99	5809.1	40200.00
6	14290.95	24.79	1.421	0.30(0.30)	0.99	6346.7	31810.00
7	16365.82	38.80	1.106	0.30(0.30)	0.99	10823.0	40100.00
8	17433.37	49.78	0.969	0.30(0.30)	0.99	14089.1	11801.00
9	18916.92	63.89	0.860	0.30(0.30)	0.99	19081.9	11530.00
10	19897.33	72.37	0.818	0.30(0.30)	0.99	22947.0	11900.00
11	21534.09	82.57	0.768	0.30(0.30)	0.99	28780.2	11330.00
12	22469.53	91.03	0.729	0.30(0.30)	0.99	33864.8	10630.00
13	22422.20	96.59	0.714	0.30(0.30)	0.99	36458.6	12330.00

14	22411.96	99.83	0.705	0.30(0.30)	0.99	38049.7	12410.00
15	22359.91	103.17	0.696	0.30(0.30)	0.99	39597.2	11600.00
16	22146.11	108.85	0.680	0.30(0.30)	0.99	41829.6	11111.00
17	21889.33	114.90	0.664	0.30(0.30)	0.99	43765.9	12201.00
18	21590.81	118.67	0.654	0.30(0.30)	0.99	44714.9	10410.00
19	21200.67	123.58	0.644	0.30(0.30)	0.99	45853.6	12231.00
20	20550.85	130.84	0.631	0.30(0.30)	0.99	47266.9	10400.00
21	20150.82	134.65	0.625	0.30(0.30)	0.99	47857.0	10200.00
22	19499.45	141.83	0.613	0.30(0.30)	0.99	48884.1	10320.00
23	18938.04	146.50	0.605	0.30(0.30)	0.99	49112.0	10210.00
24	18461.81	151.13	0.597	0.30(0.30)	0.99	49273.4	12000.00
25	15941.56	179.16	0.548	0.30(0.30)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 22469.53 Tc(MIN.) = 91.03
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33864.75

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========
MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12605.00 TO NODE 12605.30 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 305.00 DOWNSTREAM(FEET) = 302.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 217.28 CHANNEL SLOPE = 0.0138
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.72
CHANNEL FLOW THRU SUBAREA(CFS) = 22469.53
FLOW VELOCITY(FEET/SEC.) = 17.17 FLOW DEPTH(FEET) = 5.72
TRAVEL TIME(MIN.) = 0.21 Tc(MIN.) = 91.24
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13117.11	18.80	1.686	0.30(0.30)	0.99	4547.6	31700.00
2	13668.30	21.47	1.560	0.30(0.30)	0.99	5256.7	31800.00
3	13692.90	21.58	1.555	0.30(0.30)	0.99	5292.0	40300.00
4	13901.54	22.63	1.511	0.30(0.30)	0.99	5595.4	31710.00
5	14048.03	23.37	1.480	0.30(0.30)	0.99	5809.1	40200.00
6	14290.95	25.04	1.411	0.30(0.30)	0.99	6346.7	31810.00
7	16365.82	39.03	1.101	0.30(0.30)	0.99	10823.0	40100.00
8	17433.37	50.01	0.966	0.30(0.30)	0.99	14089.1	11801.00
9	18916.92	64.11	0.859	0.30(0.30)	0.99	19081.9	11530.00
10	19897.33	72.59	0.817	0.30(0.30)	0.99	22947.0	11900.00
11	21534.09	82.78	0.767	0.30(0.30)	0.99	28780.2	11330.00
12	22469.53	91.24	0.729	0.30(0.30)	0.99	33864.8	10630.00
13	22422.20	96.80	0.713	0.30(0.30)	0.99	36458.6	12330.00
14	22411.96	100.04	0.705	0.30(0.30)	0.99	38049.7	12410.00
15	22359.91	103.38	0.695	0.30(0.30)	0.99	39597.2	11600.00

16	22146.11	109.06	0.680	0.30(0.30)	0.99	41829.6	11111.00
17	21889.33	115.11	0.663	0.30(0.30)	0.99	43765.9	12201.00
18	21590.81	118.88	0.653	0.30(0.30)	0.99	44714.9	10410.00
19	21200.67	123.80	0.643	0.30(0.30)	0.99	45853.6	12231.00
20	20550.85	131.06	0.631	0.30(0.30)	0.99	47266.9	10400.00
21	20150.82	134.87	0.624	0.30(0.30)	0.99	47857.0	10200.00
22	19499.45	142.05	0.612	0.30(0.30)	0.99	48884.1	10320.00
23	18938.04	146.72	0.604	0.30(0.30)	0.99	49112.0	10210.00
24	18461.81	151.36	0.596	0.30(0.30)	0.99	49273.4	12000.00
25	15941.56	179.40	0.548	0.30(0.30)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 22469.53 Tc(MIN.) = 91.24
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33864.75

****
FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========
MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610404V.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	493.41	18.87	0.30(0.30)	0.99	395.8	40430.00
2	488.18	19.41	0.30(0.30)	0.99	400.1	40440.00
3	476.58	20.73	0.30(0.30)	0.99	409.5	40400.00
4	475.50	20.84	0.30(0.30)	0.99	410.1	40420.00
5	474.11	20.96	0.30(0.30)	0.99	410.5	40410.00

TOTAL AREA(ACRES) = 410.5

****
FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13117.11	18.80	1.686	0.30(0.30)	0.99	4547.6	31700.00
2	13668.30	21.47	1.560	0.30(0.30)	0.99	5256.7	31800.00
3	13692.90	21.58	1.555	0.30(0.30)	0.99	5292.0	40300.00
4	13901.54	22.63	1.511	0.30(0.30)	0.99	5595.4	31710.00
5	14048.03	23.37	1.480	0.30(0.30)	0.99	5809.1	40200.00
6	14290.95	25.04	1.411	0.30(0.30)	0.99	6346.7	31810.00
7	16365.82	39.03	1.101	0.30(0.30)	0.99	10823.0	40100.00
8	17433.37	50.01	0.966	0.30(0.30)	0.99	14089.1	11801.00
9	18916.92	64.11	0.859	0.30(0.30)	0.99	19081.9	11530.00
10	19897.33	72.59	0.817	0.30(0.30)	0.99	22947.0	11900.00
11	21534.09	82.78	0.767	0.30(0.30)	0.99	28780.2	11330.00

12	22469.53	91.24	0.729	0.30(0.30)	0.99	33864.8	10630.00
13	22422.20	96.80	0.713	0.30(0.30)	0.99	36458.6	12330.00
14	22411.96	100.04	0.705	0.30(0.30)	0.99	38049.7	12410.00
15	22359.91	103.38	0.695	0.30(0.30)	0.99	39597.2	11600.00
16	22146.11	109.06	0.680	0.30(0.30)	0.99	41829.6	11111.00
17	21889.33	115.11	0.663	0.30(0.30)	0.99	43765.9	12201.00
18	21590.81	118.88	0.653	0.30(0.30)	0.99	44714.9	10410.00
19	21200.67	123.80	0.643	0.30(0.30)	0.99	45853.6	12231.00
20	20550.85	131.06	0.631	0.30(0.30)	0.99	47266.9	10400.00
21	20150.82	134.87	0.624	0.30(0.30)	0.99	47857.0	10200.00
22	19499.45	142.05	0.612	0.30(0.30)	0.99	48884.1	10320.00
23	18938.04	146.72	0.604	0.30(0.30)	0.99	49112.0	10210.00
24	18461.81	151.36	0.596	0.30(0.30)	0.99	49273.4	12000.00
25	15941.56	179.40	0.548	0.30(0.30)	0.99	49891.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	493.41	18.87	1.682	0.30(0.30)	0.99	395.8	40430.00
2	488.18	19.41	1.653	0.30(0.30)	0.99	400.1	40440.00
3	476.58	20.73	1.591	0.30(0.30)	0.99	409.5	40400.00
4	475.50	20.84	1.586	0.30(0.30)	0.99	410.1	40420.00
5	474.11	20.96	1.581	0.30(0.30)	0.99	410.5	40410.00

LONGEST FLOWPATH FROM NODE 40400.00 TO NODE 12605.30 = 7428.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13610.04	18.80	1.686	0.30(0.30)	0.99	4942.0	31700.00
2	13625.14	18.87	1.682	0.30(0.30)	0.99	4962.2	40430.00
3	13731.21	19.41	1.653	0.30(0.30)	0.99	5109.7	40440.00
4	13992.69	20.73	1.591	0.30(0.30)	0.99	5470.4	40400.00
5	14013.83	20.84	1.586	0.30(0.30)	0.99	5500.9	40420.00
6	14037.87	20.96	1.581	0.30(0.30)	0.99	5532.7	40410.00
7	14134.60	21.47	1.560	0.30(0.30)	0.99	5667.2	31800.00
8	14157.37	21.58	1.555	0.30(0.30)	0.99	5702.5	40300.00
9	14349.86	22.63	1.511	0.30(0.30)	0.99	6005.8	31710.00
10	14484.87	23.37	1.480	0.30(0.30)	0.99	6219.6	40200.00
11	14702.28	25.04	1.411	0.30(0.30)	0.99	6757.2	31810.00
12	16662.86	39.03	1.101	0.30(0.30)	0.99	11233.5	40100.00
13	17680.31	50.01	0.966	0.30(0.30)	0.99	14499.6	11801.00
14	19124.34	64.11	0.859	0.30(0.30)	0.99	19492.4	11530.00
15	20089.39	72.59	0.817	0.30(0.30)	0.99	23357.5	11900.00
16	21707.71	82.78	0.767	0.30(0.30)	0.99	29190.6	11330.00
17	22628.85	91.24	0.729	0.30(0.30)	0.99	34275.2	10630.00
18	22575.89	96.80	0.713	0.30(0.30)	0.99	36869.0	12330.00
19	22562.39	100.04	0.705	0.30(0.30)	0.99	38460.2	12410.00
20	22506.96	103.38	0.695	0.30(0.30)	0.99	40007.7	11600.00
21	22287.42	109.06	0.680	0.30(0.30)	0.99	42240.1	11111.00
22	22024.54	115.11	0.663	0.30(0.30)	0.99	44176.3	12201.00
23	21722.22	118.88	0.653	0.30(0.30)	0.99	45125.4	10410.00
24	21328.53	123.80	0.643	0.30(0.30)	0.99	46264.0	12231.00
25	20674.11	131.06	0.631	0.30(0.30)	0.99	47677.4	10400.00
26	20271.67	134.87	0.624	0.30(0.30)	0.99	48267.4	10200.00
27	19615.74	142.05	0.612	0.30(0.30)	0.99	49294.6	10320.00
28	19051.38	146.72	0.604	0.30(0.30)	0.99	49522.5	10210.00
29	18572.21	151.36	0.596	0.30(0.30)	0.99	49683.9	12000.00

```
    30    16034.17  179.40    0.548  0.30( 0.30) 0.99   50301.7   10100.00
   TOTAL AREA(ACRES) =     50301.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    22628.85  Tc(MIN.) =   91.237
  EFFECTIVE AREA(ACRES) =  34275.21  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    50301.7
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.60 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    302.00  DOWNSTREAM(FEET) =    295.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   738.76   CHANNEL SLOPE =  0.0095
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.41
  CHANNEL FLOW THRU SUBAREA(CFS) =   22628.85
  FLOW VELOCITY(FEET/SEC.) =  15.21   FLOW DEPTH(FEET) =   6.41
  TRAVEL TIME(MIN.) =   0.81   Tc(MIN.) =   92.05
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.60 =  103401.57 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13610.04   19.77    1.634  0.30( 0.30) 0.99    4942.0   31700.00
      2    13625.14   19.84    1.630  0.30( 0.30) 0.99    4962.2   40430.00
      3    13731.21   20.37    1.605  0.30( 0.30) 0.99    5109.7   40440.00
      4    13992.69   21.69    1.551  0.30( 0.30) 0.99    5470.4   40400.00
      5    14014.83   21.80    1.546  0.30( 0.30) 0.99    5500.9   40420.00
      6    14037.87   21.92    1.541  0.30( 0.30) 0.99    5532.7   40410.00
      7    14134.60   22.42    1.520  0.30( 0.30) 0.99    5667.2   31800.00
      8    14157.37   22.54    1.515  0.30( 0.30) 0.99    5702.5   40300.00
      9    14349.86   23.58    1.471  0.30( 0.30) 0.99    6005.8   31710.00
     10    14484.87   24.32    1.440  0.30( 0.30) 0.99    6219.6   40200.00
     11    14702.28   25.98    1.383  0.30( 0.30) 0.99    6757.2   31810.00
     12    16662.86   39.93    1.085  0.30( 0.30) 0.99   11233.5   40100.00
     13    17680.31   50.90    0.958  0.30( 0.30) 0.99   14499.6   11801.00
     14    19124.34   64.97    0.855  0.30( 0.30) 0.99   19492.4   11530.00
     15    20089.39   73.44    0.813  0.30( 0.30) 0.99   23357.5   11900.00
     16    21707.71   83.61    0.763  0.30( 0.30) 0.99   29190.6   11330.00
     17    22628.85   92.05    0.726  0.30( 0.30) 0.99   34275.2   10630.00
     18    22575.89   97.61    0.711  0.30( 0.30) 0.99   36869.0   12330.00
     19    22562.39  100.85    0.702  0.30( 0.30) 0.99   38460.2   12410.00
     20    22506.96  104.19    0.693  0.30( 0.30) 0.99   40007.7   11600.00
     21    22287.42  109.88    0.678  0.30( 0.30) 0.99   42240.1   11111.00
     22    22024.54  115.93    0.661  0.30( 0.30) 0.99   44176.3   12201.00
     23    21722.22  119.70    0.651  0.30( 0.30) 0.99   45125.4   10410.00
     24    21328.53  124.62    0.642  0.30( 0.30) 0.99   46264.0   12231.00
     25    20674.11  131.89    0.630  0.30( 0.30) 0.99   47677.4   10400.00
     26    20271.67  135.71    0.623  0.30( 0.30) 0.99   48267.4   10200.00
     27    19615.74  142.90    0.611  0.30( 0.30) 0.99   49294.6   10320.00
     28    19051.38  147.58    0.603  0.30( 0.30) 0.99   49522.5   10210.00
     29    18572.21  152.22    0.595  0.30( 0.30) 0.99   49683.9   12000.00
```



```
    30    16034.17  180.32    0.547  0.30( 0.30) 0.99   50301.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   22628.85  Tc(MIN.) =   92.05
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34275.21

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610405V.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      115.81   14.42  0.30( 0.30) 1.00      76.8   40510.00
      2      112.57   16.04  0.30( 0.30) 1.00      81.4   40500.00
    TOTAL AREA(ACRES) =       81.4

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13610.04   19.77    1.634  0.30( 0.30) 0.99    4942.0   31700.00
      2    13625.14   19.84    1.630  0.30( 0.30) 0.99    4962.2   40430.00
      3    13731.21   20.37    1.605  0.30( 0.30) 0.99    5109.7   40440.00
      4    13992.69   21.69    1.551  0.30( 0.30) 0.99    5470.4   40400.00
      5    14014.83   21.80    1.546  0.30( 0.30) 0.99    5500.9   40420.00
      6    14037.87   21.92    1.541  0.30( 0.30) 0.99    5532.7   40410.00
      7    14134.60   22.42    1.520  0.30( 0.30) 0.99    5667.2   31800.00
      8    14157.37   22.54    1.515  0.30( 0.30) 0.99    5702.5   40300.00
      9    14349.86   23.58    1.471  0.30( 0.30) 0.99    6005.8   31710.00
     10    14484.87   24.32    1.440  0.30( 0.30) 0.99    6219.6   40200.00
     11    14702.28   25.98    1.383  0.30( 0.30) 0.99    6757.2   31810.00
     12    16662.86   39.93    1.085  0.30( 0.30) 0.99   11233.5   40100.00
     13    17680.31   50.90    0.958  0.30( 0.30) 0.99   14499.6   11801.00
     14    19124.34   64.97    0.855  0.30( 0.30) 0.99   19492.4   11530.00
     15    20089.39   73.44    0.813  0.30( 0.30) 0.99   23357.5   11900.00
     16    21707.71   83.61    0.763  0.30( 0.30) 0.99   29190.6   11330.00
     17    22628.85   92.05    0.726  0.30( 0.30) 0.99   34275.2   10630.00
     18    22575.89   97.61    0.711  0.30( 0.30) 0.99   36869.0   12330.00
     19    22562.39  100.85    0.702  0.30( 0.30) 0.99   38460.2   12410.00
     20    22506.96  104.19    0.693  0.30( 0.30) 0.99   40007.7   11600.00
     21    22287.42  109.88    0.678  0.30( 0.30) 0.99   42240.1   11111.00
     22    22024.54  115.93    0.661  0.30( 0.30) 0.99   44176.3   12201.00
     23    21722.22  119.70    0.651  0.30( 0.30) 0.99   45125.4   10410.00
     24    21328.53  124.62    0.642  0.30( 0.30) 0.99   46264.0   12231.00
```

25	20674.11	131.89	0.630	0.30(0.30)	0.99	47677.4	10400.00
26	20271.67	135.71	0.623	0.30(0.30)	0.99	48267.4	10200.00
27	19615.74	142.90	0.611	0.30(0.30)	0.99	49294.6	10320.00
28	19051.38	147.58	0.603	0.30(0.30)	0.99	49522.5	10210.00
29	18572.21	152.22	0.595	0.30(0.30)	0.99	49683.9	12000.00
30	16034.17	180.32	0.547	0.30(0.30)	0.99	50301.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	115.81	14.42	1.974	0.30(0.30)	1.00	76.8	40510.00
2	112.57	16.04	1.836	0.30(0.30)	1.00	81.4	40500.00

LONGEST FLOWPATH FROM NODE 40500.00 TO NODE 12605.60 = 4091.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12573.70	14.42	1.974	0.30(0.30)	0.99	3682.4	40510.00
2	12832.75	16.04	1.836	0.30(0.30)	0.99	4091.8	40500.00
3	13707.76	19.77	1.634	0.30(0.30)	0.99	5023.3	31700.00
4	13722.58	19.84	1.630	0.30(0.30)	0.99	5043.6	40430.00
5	13826.86	20.37	1.605	0.30(0.30)	0.99	5191.1	40440.00
6	14084.32	21.69	1.551	0.30(0.30)	0.99	5551.8	40400.00
7	14106.12	21.80	1.546	0.30(0.30)	0.99	5582.3	40420.00
8	14128.80	21.92	1.541	0.30(0.30)	0.99	5614.1	40410.00
9	14224.00	22.42	1.520	0.30(0.30)	0.99	5748.5	31800.00
10	14246.41	22.54	1.515	0.30(0.30)	0.99	5783.9	40300.00
11	14435.70	23.58	1.471	0.30(0.30)	0.99	6087.2	31710.00
12	14568.45	24.32	1.440	0.30(0.30)	0.99	6301.0	40200.00
13	14781.67	25.98	1.383	0.30(0.30)	0.99	6838.6	31810.00
14	16720.42	39.93	1.085	0.30(0.30)	0.99	11314.8	40100.00
15	17728.57	50.90	0.958	0.30(0.30)	0.99	14581.0	11801.00
16	19165.01	64.97	0.855	0.30(0.30)	0.99	19573.7	11530.00
17	20127.03	73.44	0.813	0.30(0.30)	0.99	23438.8	11900.00
18	21741.69	83.61	0.763	0.30(0.30)	0.99	29272.0	11330.00
19	22660.12	92.05	0.726	0.30(0.30)	0.99	34356.6	10630.00
20	22606.06	97.61	0.711	0.30(0.30)	0.99	36950.4	12330.00
21	22591.91	100.85	0.702	0.30(0.30)	0.99	38541.6	12410.00
22	22535.81	104.19	0.693	0.30(0.30)	0.99	40089.1	11600.00
23	22315.13	109.88	0.678	0.30(0.30)	0.99	42321.5	11111.00
24	22051.04	115.93	0.661	0.30(0.30)	0.99	44257.7	12201.00
25	21747.96	119.70	0.651	0.30(0.30)	0.99	45206.7	10410.00
26	21353.64	124.62	0.642	0.30(0.30)	0.99	46345.4	12231.00
27	20698.30	131.89	0.630	0.30(0.30)	0.99	47758.8	10400.00
28	20295.38	135.71	0.623	0.30(0.30)	0.99	48348.8	10200.00
29	19638.55	142.90	0.611	0.30(0.30)	0.99	49375.9	10320.00
30	19073.59	147.58	0.603	0.30(0.30)	0.99	49603.8	10210.00
31	18593.84	152.22	0.595	0.30(0.30)	0.99	49765.3	12000.00
32	16052.29	180.32	0.547	0.30(0.30)	0.99	50383.1	10100.00

TOTAL AREA(ACRES) = 50383.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 22660.12 Tc(MIN.) = 92.047
EFFECTIVE AREA(ACRES) = 34356.59 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50383.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

****

FLOW PROCESS FROM NODE 12605.60 TO NODE 12606.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 295.00 DOWNSTREAM(FEET) = 286.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1203.43 CHANNEL SLOPE = 0.0075
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.87
CHANNEL FLOW THRU SUBAREA(CFS) = 22660.12
FLOW VELOCITY(FEET/SEC.) = 14.08 FLOW DEPTH(FEET) = 6.87
TRAVEL TIME(MIN.) = 1.42 Tc(MIN.) = 93.47
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12573.70	16.17	1.829	0.30(0.30)	0.99	3682.4	40510.00
2	12832.75	17.78	1.742	0.30(0.30)	0.99	4091.8	40500.00
3	13707.76	21.46	1.560	0.30(0.30)	0.99	5023.3	31700.00
4	13722.58	21.53	1.557	0.30(0.30)	0.99	5043.6	40430.00
5	13826.86	22.06	1.535	0.30(0.30)	0.99	5191.1	40440.00
6	14084.32	23.37	1.480	0.30(0.30)	0.99	5551.8	40400.00
7	14106.12	23.48	1.476	0.30(0.30)	0.99	5582.3	40420.00
8	14128.80	23.59	1.471	0.30(0.30)	0.99	5614.1	40410.00
9	14224.00	24.09	1.450	0.30(0.30)	0.99	5748.5	31800.00
10	14246.41	24.21	1.445	0.30(0.30)	0.99	5783.9	40300.00
11	14435.70	25.24	1.405	0.30(0.30)	0.99	6087.2	31710.00
12	14568.45	25.98	1.383	0.30(0.30)	0.99	6301.0	40200.00
13	14781.67	27.63	1.335	0.30(0.30)	0.99	6838.6	31810.00
14	16720.42	41.52	1.066	0.30(0.30)	0.99	11314.8	40100.00
15	17728.57	52.45	0.945	0.30(0.30)	0.99	14581.0	11801.00
16	19165.01	66.48	0.847	0.30(0.30)	0.99	19573.7	11530.00
17	20127.03	74.92	0.806	0.30(0.30)	0.99	23438.8	11900.00
18	21741.69	85.05	0.756	0.30(0.30)	0.99	29272.0	11330.00
19	22660.12	93.47	0.723	0.30(0.30)	0.99	34356.6	10630.00
20	22606.06	99.04	0.707	0.30(0.30)	0.99	36950.4	12330.00
21	22591.91	102.27	0.698	0.30(0.30)	0.99	38541.6	12410.00
22	22535.81	105.62	0.689	0.30(0.30)	0.99	40089.1	11600.00
23	22315.13	111.31	0.674	0.30(0.30)	0.99	42321.5	11111.00
24	22051.04	117.37	0.657	0.30(0.30)	0.99	44257.7	12201.00
25	21747.96	121.15	0.648	0.30(0.30)	0.99	45206.7	10410.00
26	21353.64	126.08	0.640	0.30(0.30)	0.99	46345.4	12231.00
27	20698.30	133.36	0.627	0.30(0.30)	0.99	47758.8	10400.00
28	20295.38	137.19	0.620	0.30(0.30)	0.99	48348.8	10200.00
29	19638.55	144.40	0.608	0.30(0.30)	0.99	49375.9	10320.00
30	19073.59	149.09	0.600	0.30(0.30)	0.99	49603.8	10210.00
31	18593.84	153.75	0.592	0.30(0.30)	0.99	49765.3	12000.00
32	16052.29	181.92	0.545	0.30(0.30)	0.99	50383.1	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 22660.12 Tc(MIN.) = 93.47
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34356.59

****

```
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610406V.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      152.48   21.61  0.30( 0.30) 0.99     135.0   40600.00
    TOTAL AREA(ACRES) =      135.0

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12573.70   16.17    1.829  0.30( 0.30) 0.99    3682.4   40510.00
      2    12832.75   17.78    1.742  0.30( 0.30) 0.99    4091.8   40500.00
      3    13707.76   21.46    1.560  0.30( 0.30) 0.99    5023.3   31700.00
      4    13722.58   21.53    1.557  0.30( 0.30) 0.99    5043.6   40430.00
      5    13826.86   22.06    1.535  0.30( 0.30) 0.99    5191.1   40440.00
      6    14084.32   23.37    1.480  0.30( 0.30) 0.99    5551.8   40400.00
      7    14106.12   23.48    1.476  0.30( 0.30) 0.99    5582.3   40420.00
      8    14128.80   23.59    1.471  0.30( 0.30) 0.99    5614.1   40410.00
      9    14224.00   24.09    1.450  0.30( 0.30) 0.99    5748.5   31800.00
     10    14246.41   24.21    1.445  0.30( 0.30) 0.99    5783.9   40300.00
     11    14435.70   25.24    1.405  0.30( 0.30) 0.99    6087.2   31710.00
     12    14568.45   25.98    1.383  0.30( 0.30) 0.99    6301.0   40200.00
     13    14781.67   27.63    1.335  0.30( 0.30) 0.99    6838.6   31810.00
     14    16720.42   41.52    1.066  0.30( 0.30) 0.99   11314.8   40100.00
     15    17728.57   52.45    0.945  0.30( 0.30) 0.99   14581.0   11801.00
     16    19165.01   66.48    0.847  0.30( 0.30) 0.99   19573.7   11530.00
     17    20127.03   74.92    0.806  0.30( 0.30) 0.99   23438.8   11900.00
     18    21741.69   85.05    0.756  0.30( 0.30) 0.99   29272.0   11330.00
     19    22660.12   93.47    0.723  0.30( 0.30) 0.99   34356.6   10630.00
     20    22606.06   99.04    0.707  0.30( 0.30) 0.99   36950.4   12330.00
     21    22591.91  102.27    0.698  0.30( 0.30) 0.99   38541.6   12410.00
     22    22535.81  105.62    0.689  0.30( 0.30) 0.99   40089.1   11600.00
     23    22315.13  111.31    0.674  0.30( 0.30) 0.99   42321.5   11111.00
     24    22051.04  117.37    0.657  0.30( 0.30) 0.99   44257.7   12201.00
     25    21747.96  121.15    0.648  0.30( 0.30) 0.99   45206.7   10410.00
     26    21353.64  126.08    0.640  0.30( 0.30) 0.99   46345.4   12231.00
     27    20698.30  133.36    0.627  0.30( 0.30) 0.99   47758.8   10400.00
     28    20295.38  137.19    0.620  0.30( 0.30) 0.99   48348.8   10200.00
     29    19638.55  144.40    0.608  0.30( 0.30) 0.99   49375.9   10320.00
     30    19073.59  149.09    0.600  0.30( 0.30) 0.99   49603.8   10210.00
     31    18593.84  153.75    0.592  0.30( 0.30) 0.99   49765.3   12000.00
     32    16052.29  181.92    0.545  0.30( 0.30) 0.99   50383.1   10100.00
```



```
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      152.48   21.61    1.554  0.30( 0.30) 0.99     135.0   40600.00
  LONGEST FLOWPATH FROM NODE  40600.00 TO NODE  12606.00 =    6107.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12712.84   16.17    1.829  0.30( 0.30) 0.99    3783.4   40510.00
      2    12976.99   17.78    1.742  0.30( 0.30) 0.99    4202.8   40500.00
      3    13859.94   21.46    1.560  0.30( 0.30) 0.99    5157.4   31700.00
      4    13874.91   21.53    1.557  0.30( 0.30) 0.99    5178.1   40430.00
      5    13890.06   21.61    1.554  0.30( 0.30) 0.99    5199.8   40600.00
      6    13977.03   22.06    1.535  0.30( 0.30) 0.99    5326.1   40440.00
      7    14227.88   23.37    1.480  0.30( 0.30) 0.99    5686.8   40400.00
      8    14249.11   23.48    1.476  0.30( 0.30) 0.99    5717.2   40420.00
      9    14271.21   23.59    1.471  0.30( 0.30) 0.99    5749.0   40410.00
     10    14363.87   24.09    1.450  0.30( 0.30) 0.99    5883.5   31800.00
     11    14385.68   24.21    1.445  0.30( 0.30) 0.99    5918.8   40300.00
     12    14570.09   25.24    1.405  0.30( 0.30) 0.99    6222.2   31710.00
     13    14700.21   25.98    1.383  0.30( 0.30) 0.99    6436.0   40200.00
     14    14907.54   27.63    1.335  0.30( 0.30) 0.99    6973.5   31810.00
     15    16813.66   41.52    1.066  0.30( 0.30) 0.99   11449.8   40100.00
     16    17807.07   52.45    0.945  0.30( 0.30) 0.99   14715.9   11801.00
     17    19231.67   66.48    0.847  0.30( 0.30) 0.99   19708.7   11530.00
     18    20188.67   74.92    0.806  0.30( 0.30) 0.99   23573.8   11900.00
     19    21797.30   85.05    0.756  0.30( 0.30) 0.99   29407.0   11330.00
     20    22711.64   93.47    0.723  0.30( 0.30) 0.99   34491.6   10630.00
     21    22655.73   99.04    0.707  0.30( 0.30) 0.99   37085.4   12330.00
     22    22640.50  102.27    0.698  0.30( 0.30) 0.99   38676.6   12410.00
     23    22583.29  105.62    0.689  0.30( 0.30) 0.99   40224.0   11600.00
     24    22360.73  111.31    0.674  0.30( 0.30) 0.99   42456.4   11111.00
     25    22094.62  117.37    0.657  0.30( 0.30) 0.99   44392.7   12201.00
     26    21790.43  121.15    0.648  0.30( 0.30) 0.99   45341.7   10410.00
     27    21395.08  126.08    0.640  0.30( 0.30) 0.99   46480.4   12231.00
     28    20738.22  133.36    0.627  0.30( 0.30) 0.99   47893.7   10400.00
     29    20334.50  137.19    0.620  0.30( 0.30) 0.99   48483.8   10200.00
     30    19676.17  144.40    0.608  0.30( 0.30) 0.99   49510.9   10320.00
     31    19110.24  149.09    0.600  0.30( 0.30) 0.99   49738.8   10210.00
     32    18629.51  153.75    0.592  0.30( 0.30) 0.99   49900.2   12000.00
     33    16082.30  181.92    0.545  0.30( 0.30) 0.99   50518.0   10100.00
    TOTAL AREA(ACRES) =     50518.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    22711.64  Tc(MIN.) =   93.472
  EFFECTIVE AREA(ACRES) =  34491.56  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    50518.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    50518.0  TC(MIN.) =     93.47
  EFFECTIVE AREA(ACRES) =  34491.56  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.994
  PEAK FLOW RATE(CFS)   =   22711.64
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12712.84	16.17	1.829	0.30(0.30)	0.99	3783.4	40510.00
2	12976.99	17.78	1.742	0.30(0.30)	0.99	4202.8	40500.00
3	13859.94	21.46	1.560	0.30(0.30)	0.99	5157.4	31700.00
4	13874.91	21.53	1.557	0.30(0.30)	0.99	5178.1	40430.00
5	13890.06	21.61	1.554	0.30(0.30)	0.99	5199.8	40600.00
6	13977.03	22.06	1.535	0.30(0.30)	0.99	5326.1	40440.00
7	14227.88	23.37	1.480	0.30(0.30)	0.99	5686.8	40400.00
8	14249.11	23.48	1.476	0.30(0.30)	0.99	5717.2	40420.00
9	14271.21	23.59	1.471	0.30(0.30)	0.99	5749.0	40410.00
10	14363.87	24.09	1.450	0.30(0.30)	0.99	5883.5	31800.00
11	14385.68	24.21	1.445	0.30(0.30)	0.99	5918.8	40300.00
12	14570.09	25.24	1.405	0.30(0.30)	0.99	6222.2	31710.00
13	14700.21	25.98	1.383	0.30(0.30)	0.99	6436.0	40200.00
14	14907.54	27.63	1.335	0.30(0.30)	0.99	6973.5	31810.00
15	16813.66	41.52	1.066	0.30(0.30)	0.99	11449.8	40100.00
16	17807.07	52.45	0.945	0.30(0.30)	0.99	14715.9	11801.00
17	19231.67	66.48	0.847	0.30(0.30)	0.99	19708.7	11530.00
18	20188.67	74.92	0.806	0.30(0.30)	0.99	23573.8	11900.00
19	21797.30	85.05	0.756	0.30(0.30)	0.99	29407.0	11330.00
20	22711.64	93.47	0.723	0.30(0.30)	0.99	34491.6	10630.00
21	22655.73	99.04	0.707	0.30(0.30)	0.99	37085.4	12330.00
22	22640.50	102.27	0.698	0.30(0.30)	0.99	38676.6	12410.00
23	22583.29	105.62	0.689	0.30(0.30)	0.99	40224.0	11600.00
24	22360.73	111.31	0.674	0.30(0.30)	0.99	42456.4	11111.00
25	22094.62	117.37	0.657	0.30(0.30)	0.99	44392.7	12201.00
26	21790.43	121.15	0.648	0.30(0.30)	0.99	45341.7	10410.00
27	21395.08	126.08	0.640	0.30(0.30)	0.99	46480.4	12231.00
28	20738.22	133.36	0.627	0.30(0.30)	0.99	47893.7	10400.00
29	20334.50	137.19	0.620	0.30(0.30)	0.99	48483.8	10200.00
30	19676.17	144.40	0.608	0.30(0.30)	0.99	49510.9	10320.00
31	19110.24	149.09	0.600	0.30(0.30)	0.99	49738.8	10210.00
32	18629.51	153.75	0.592	0.30(0.30)	0.99	49900.2	12000.00
33	16082.30	181.92	0.545	0.30(0.30)	0.99	50518.0	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S27.DAT
  TIME/DATE OF STUDY: 08:57 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.872
   2)   10.00;  2.570
   3)   15.00;  1.884
   4)   20.00;  1.613
   5)   25.00;  1.406
   6)   30.00;  1.261
   7)   40.00;  1.079
   8)   50.00;  0.961
   9)   60.00;  0.874
  10)   90.00;  0.727
  11)  120.00;  0.644
  12)  180.00;  0.541
  13)  360.00;  0.401
  14) 1200.00;  0.176
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S26.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    12976.99   17.78  0.30( 0.30) 0.99    4202.8   40500.00
      2    13977.03   22.06  0.30( 0.30) 0.99    5326.1   40440.00
      3    14907.54   27.63  0.30( 0.30) 0.99    6973.5   31810.00
      4    16813.66   41.52  0.30( 0.30) 0.99   11449.8   40100.00
      5    17807.07   52.45  0.30( 0.30) 0.99   14715.9   11801.00
      6    19231.67   66.48  0.30( 0.30) 0.99   19708.7   11530.00
      7    20188.67   74.92  0.30( 0.30) 0.99   23573.8   11900.00
      8    21797.30   85.05  0.30( 0.30) 0.99   29407.0   11330.00
      9    22711.64   93.47  0.30( 0.30) 0.99   34491.6   10630.00
     10    22655.73   99.04  0.30( 0.30) 0.99   37085.4   12330.00
     11    22583.29  105.62  0.30( 0.30) 0.99   40224.0   11600.00
     12    22360.73  111.31  0.30( 0.30) 0.99   42456.4   11111.00
     13    22094.62  117.37  0.30( 0.30) 0.99   44392.7   12201.00
     14    21395.08  126.08  0.30( 0.30) 0.99   46480.4   12231.00
     15    20738.22  133.36  0.30( 0.30) 0.99   47893.7   10400.00
     16    20334.50  137.19  0.30( 0.30) 0.99   48483.8   10200.00
     17    19676.17  144.40  0.30( 0.30) 0.99   49510.9   10320.00
     18    19110.24  149.09  0.30( 0.30) 0.99   49738.8   10210.00
     19    18629.51  153.75  0.30( 0.30) 0.99   49900.2   12000.00
     20    16082.30  181.92  0.30( 0.30) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =    50518.0

**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    12976.99   17.78  0.30( 0.30) 0.99    4202.8   40500.00
      2    13977.03   22.06  0.30( 0.30) 0.99    5326.1   40440.00
      3    14907.54   27.63  0.30( 0.30) 0.99    6973.5   31810.00
      4    16813.66   41.52  0.30( 0.30) 0.99   11449.8   40100.00
      5    17807.07   52.45  0.30( 0.30) 0.99   14715.9   11801.00
      6    19231.67   66.48  0.30( 0.30) 0.99   19708.7   11530.00
      7    20188.67   74.92  0.30( 0.30) 0.99   23573.8   11900.00
      8    21797.30   85.05  0.30( 0.30) 0.99   29407.0   11330.00
      9    22711.64   93.47  0.30( 0.30) 0.99   34491.6   10630.00
     10    22655.73   99.04  0.30( 0.30) 0.99   37085.4   12330.00
     11    22583.29  105.62  0.30( 0.30) 0.99   40224.0   11600.00
     12    22360.73  111.31  0.30( 0.30) 0.99   42456.4   11111.00
     13    22094.62  117.37  0.30( 0.30) 0.99   44392.7   12201.00
     14    21395.08  126.08  0.30( 0.30) 0.99   46480.4   12231.00
     15    20738.22  133.36  0.30( 0.30) 0.99   47893.7   10400.00
     16    20334.50  137.19  0.30( 0.30) 0.99   48483.8   10200.00
     17    19676.17  144.40  0.30( 0.30) 0.99   49510.9   10320.00
     18    19110.24  149.09  0.30( 0.30) 0.99   49738.8   10210.00
```

```
    19    18629.51  153.75  0.30( 0.30) 0.99   49900.2   12000.00
    20    16082.30  181.92  0.30( 0.30) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =     50518.0

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12701.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    286.00  DOWNSTREAM(FEET) =    276.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.19   CHANNEL SLOPE =  0.0079
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.76
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.713
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.55      0.30     0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22713.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.36
  AVERAGE FLOW DEPTH(FEET) =   6.76   TRAVEL TIME(MIN.) =   1.46
  Tc(MIN.) =   94.93
  SUBAREA AREA(ACRES) =     7.55       SUBAREA RUNOFF(CFS) =    3.04
  EFFECTIVE AREA(ACRES) =  34499.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50525.6         PEAK FLOW RATE(CFS) =   22711.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.76   FLOW VELOCITY(FEET/SEC.) =  14.36
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12701.00 =  105865.19 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12976.99   19.55    1.637  0.30( 0.30) 0.99    4210.3   40500.00
      2    13977.03   23.79    1.456  0.30( 0.30) 0.99    5333.6   40440.00
      3    14907.54   29.32    1.281  0.30( 0.30) 0.99    6981.1   31810.00
      4    16813.66   43.14    1.042  0.30( 0.30) 0.99   11457.4   40100.00
      5    17807.07   54.03    0.926  0.30( 0.30) 0.99   14723.5   11801.00
      6    19231.67   68.02    0.835  0.30( 0.30) 0.99   19716.3   11530.00
      7    20188.67   76.44    0.793  0.30( 0.30) 0.99   23581.4   11900.00
      8    21797.30   86.53    0.744  0.30( 0.30) 0.99   29414.5   11330.00
      9    22711.64   94.93    0.713  0.30( 0.30) 0.99   34499.1   10630.00
     10    22655.73  100.50    0.698  0.30( 0.30) 0.99   37092.9   12330.00
     11    22583.29  107.08    0.680  0.30( 0.30) 0.99   40231.6   11600.00
     12    22360.73  112.78    0.664  0.30( 0.30) 0.99   42464.0   11111.00
     13    22094.62  118.84    0.647  0.30( 0.30) 0.99   44400.2   12201.00
     14    21395.08  127.57    0.631  0.30( 0.30) 0.99   46487.9   12231.00
     15    20738.22  134.87    0.618  0.30( 0.30) 0.99   47901.3   10400.00
     16    20334.50  138.71    0.612  0.30( 0.30) 0.99   48491.3   10200.00
```



```
     17    19676.17  145.93    0.599  0.30( 0.30) 0.99   49518.5   10320.00
     18    19110.24  150.64    0.591  0.30( 0.30) 0.99   49746.4   10210.00
     19    18629.51  155.31    0.583  0.30( 0.30) 0.99   49907.8   12000.00
     20    16082.30  183.57    0.538  0.30( 0.30) 0.99   50525.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   22711.64  Tc(MIN.) =   94.93
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34499.11

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    276.00  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   147.65   CHANNEL SLOPE =  0.0068
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.08
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.713
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        1.49      0.30     0.972     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.972
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22711.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.64
  AVERAGE FLOW DEPTH(FEET) =   7.08   TRAVEL TIME(MIN.) =   0.18
  Tc(MIN.) =   95.11
  SUBAREA AREA(ACRES) =     1.49       SUBAREA RUNOFF(CFS) =    0.56
  EFFECTIVE AREA(ACRES) =  34500.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50527.1         PEAK FLOW RATE(CFS) =   22711.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.08   FLOW VELOCITY(FEET/SEC.) =  13.64
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12976.99   19.77    1.626  0.30( 0.30) 0.99    4211.8   40500.00
      2    13977.03   24.00    1.447  0.30( 0.30) 0.99    5335.1   40440.00
      3    14907.54   29.53    1.275  0.30( 0.30) 0.99    6982.6   31810.00
      4    16813.66   43.34    1.040  0.30( 0.30) 0.99   11458.8   40100.00
      5    17807.07   54.23    0.924  0.30( 0.30) 0.99   14725.0   11801.00
      6    19231.67   68.22    0.834  0.30( 0.30) 0.99   19717.7   11530.00
      7    20188.67   76.63    0.793  0.30( 0.30) 0.99   23582.8   11900.00
      8    21797.30   86.72    0.743  0.30( 0.30) 0.99   29416.0   11330.00
      9    22711.64   95.11    0.713  0.30( 0.30) 0.99   34500.6   10630.00
     10    22655.73  100.68    0.697  0.30( 0.30) 0.99   37094.4   12330.00
     11    22583.29  107.26    0.679  0.30( 0.30) 0.99   40233.1   11600.00
```

```
    12    22360.73  112.96    0.663  0.30( 0.30) 0.99   42465.5   11111.00
    13    22094.62  119.02    0.647  0.30( 0.30) 0.99   44401.7   12201.00
    14    21395.08  127.75    0.631  0.30( 0.30) 0.99   46489.4   12231.00
    15    20738.22  135.05    0.618  0.30( 0.30) 0.99   47902.8   10400.00
    16    20334.50  138.90    0.612  0.30( 0.30) 0.99   48492.8   10200.00
    17    19676.17  146.12    0.599  0.30( 0.30) 0.99   49519.9   10320.00
    18    19110.24  150.83    0.591  0.30( 0.30) 0.99   49747.8   10210.00
    19    18629.51  155.51    0.583  0.30( 0.30) 0.99   49909.3   12000.00
    20    16082.30  183.77    0.538  0.30( 0.30) 0.99   50527.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   22711.64  Tc(MIN.) =   95.11
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34500.60

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   95.11
  RAINFALL INTENSITY(INCH/HR) =   0.71
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =   34500.60
  TOTAL STREAM AREA(ACRES) =   50527.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   22711.64

****************************************************************************
  FLOW PROCESS FROM NODE  12710.00 TO NODE  12711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.56
  ELEVATION DATA: UPSTREAM(FEET) =    940.78  DOWNSTREAM(FEET) =    657.79

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.910
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.034
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.56      0.30     1.000     0   13.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.24
  TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =     10.24

****************************************************************************
  FLOW PROCESS FROM NODE  12711.00 TO NODE  12712.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    657.79  DOWNSTREAM(FEET) =    585.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =   766.00   CHANNEL SLOPE =  0.0942
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.796
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.94      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.71
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   2.71
  Tc(MIN.) =   16.62
  SUBAREA AREA(ACRES) =    26.94       SUBAREA RUNOFF(CFS) =   36.28
  EFFECTIVE AREA(ACRES) =     33.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.5         PEAK FLOW RATE(CFS) =      45.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   5.53
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12712.00 =    1709.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12712.00 TO NODE  12713.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.63  DOWNSTREAM(FEET) =    463.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.79   CHANNEL SLOPE =  0.1188
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.75
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.650
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.34
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   19.32
  SUBAREA AREA(ACRES) =    14.73       SUBAREA RUNOFF(CFS) =   17.90
  EFFECTIVE AREA(ACRES) =     48.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       48.2         PEAK FLOW RATE(CFS) =      58.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   6.54
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12713.00 =    2735.35 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12713.00 TO NODE  12714.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    463.75  DOWNSTREAM(FEET) =    360.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1148.54   CHANNEL SLOPE =  0.0901
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.535
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     117.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.47
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =   2.56
  Tc(MIN.) =   21.88
  SUBAREA AREA(ACRES) =   105.64       SUBAREA RUNOFF(CFS) =  117.43
  EFFECTIVE AREA(ACRES) =    153.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      153.9         PEAK FLOW RATE(CFS) =     171.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.55   FLOW VELOCITY(FEET/SEC.) =   8.40
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12714.00 =    3883.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    360.30  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1314.99   CHANNEL SLOPE =  0.0649
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.06
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.425
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     235.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
```



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  AVERAGE FLOW DEPTH(FEET) =   2.03   TRAVEL TIME(MIN.) =   2.66
  Tc(MIN.) =   24.54
  SUBAREA AREA(ACRES) =   127.13       SUBAREA RUNOFF(CFS) =  128.72
  EFFECTIVE AREA(ACRES) =    281.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.0         PEAK FLOW RATE(CFS) =     284.51
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.25   FLOW VELOCITY(FEET/SEC.) =   8.73
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12720.00 =    5198.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.54
  RAINFALL INTENSITY(INCH/HR) =   1.42
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     281.00
  TOTAL STREAM AREA(ACRES) =     281.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     284.51

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1    12976.99   19.77    1.626  0.30( 0.30) 0.99    4211.8   40500.00
      1    13977.03   24.00    1.447  0.30( 0.30) 0.99    5335.1   40440.00
      1    14907.54   29.53    1.275  0.30( 0.30) 0.99    6982.6   31810.00
      1    16813.66   43.34    1.040  0.30( 0.30) 0.99   11458.8   40100.00
      1    17807.07   54.23    0.924  0.30( 0.30) 0.99   14725.0   11801.00
      1    19231.67   68.22    0.834  0.30( 0.30) 0.99   19717.7   11530.00
      1    20188.67   76.63    0.793  0.30( 0.30) 0.99   23582.8   11900.00
      1    21797.30   86.72    0.743  0.30( 0.30) 0.99   29416.0   11330.00
      1    22711.64   95.11    0.713  0.30( 0.30) 0.99   34500.6   10630.00
      1    22655.73  100.68    0.697  0.30( 0.30) 0.99   37094.4   12330.00
      1    22583.29  107.26    0.679  0.30( 0.30) 0.99   40233.1   11600.00
      1    22360.73  112.96    0.663  0.30( 0.30) 0.99   42465.5   11111.00
      1    22094.62  119.02    0.647  0.30( 0.30) 0.99   44401.7   12201.00
      1    21395.08  127.75    0.631  0.30( 0.30) 0.99   46489.4   12231.00
      1    20738.22  135.05    0.618  0.30( 0.30) 0.99   47902.8   10400.00
      1    20334.50  138.90    0.612  0.30( 0.30) 0.99   48492.8   10200.00
      1    19676.17  146.12    0.599  0.30( 0.30) 0.99   49519.9   10320.00
      1    19110.24  150.83    0.591  0.30( 0.30) 0.99   49747.8   10210.00
      1    18629.51  155.51    0.583  0.30( 0.30) 0.99   49909.3   12000.00
      1    16082.30  183.77    0.538  0.30( 0.30) 0.99   50527.1   10100.00
      2      284.51   24.54    1.425  0.30( 0.30) 1.00     281.0   12710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
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** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13247.02	19.77	1.626	0.30(0.30)	0.99	4438.2	40500.00
2	14260.82	24.00	1.447	0.30(0.30)	0.99	5609.9	40440.00
3	14352.20	24.54	1.425	0.30(0.30)	0.99	5776.6	12710.00
4	15154.05	29.53	1.275	0.30(0.30)	0.99	7263.6	31810.00
5	17000.73	43.34	1.040	0.30(0.30)	0.99	11739.8	40100.00
6	17964.95	54.23	0.924	0.30(0.30)	0.99	15006.0	11801.00
7	19366.67	68.22	0.834	0.30(0.30)	0.99	19998.7	11530.00
8	20313.24	76.63	0.793	0.30(0.30)	0.99	23863.8	11900.00
9	21909.38	86.72	0.743	0.30(0.30)	0.99	29697.0	11330.00
10	22816.07	95.11	0.713	0.30(0.30)	0.99	34781.6	10630.00
11	22756.26	100.68	0.697	0.30(0.30)	0.99	37375.4	12330.00
12	22679.22	107.26	0.679	0.30(0.30)	0.99	40514.1	11600.00
13	22452.67	112.96	0.663	0.30(0.30)	0.99	42746.5	11111.00
14	22182.32	119.02	0.647	0.30(0.30)	0.99	44682.7	12201.00
15	21478.72	127.75	0.631	0.30(0.30)	0.99	46770.4	12231.00
16	20818.70	135.05	0.618	0.30(0.30)	0.99	48183.8	10400.00
17	20413.31	138.90	0.612	0.30(0.30)	0.99	48773.8	10200.00
18	19751.84	146.12	0.599	0.30(0.30)	0.99	49800.9	10320.00
19	19183.87	150.83	0.591	0.30(0.30)	0.99	50028.8	10210.00
20	18701.11	155.51	0.583	0.30(0.30)	0.99	50190.3	12000.00
21	16142.53	183.77	0.538	0.30(0.30)	0.99	50808.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 22816.07 Tc(MIN.) = 95.11
EFFECTIVE AREA(ACRES) = 34781.60 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50808.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========
MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610316V.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	218.01	27.26	0.30(0.30)	0.98	231.4	31600.00

TOTAL AREA(ACRES) = 231.4

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13247.02	19.77	1.626	0.30(0.30)	0.99	4438.2	40500.00
2	14260.82	24.00	1.447	0.30(0.30)	0.99	5609.9	40440.00
3	14352.20	24.54	1.425	0.30(0.30)	0.99	5776.6	12710.00
4	15154.05	29.53	1.275	0.30(0.30)	0.99	7263.6	31810.00
5	17000.73	43.34	1.040	0.30(0.30)	0.99	11739.8	40100.00
6	17964.95	54.23	0.924	0.30(0.30)	0.99	15006.0	11801.00
7	19366.67	68.22	0.834	0.30(0.30)	0.99	19998.7	11530.00
8	20313.24	76.63	0.793	0.30(0.30)	0.99	23863.8	11900.00
9	21909.38	86.72	0.743	0.30(0.30)	0.99	29697.0	11330.00
10	22816.07	95.11	0.713	0.30(0.30)	0.99	34781.6	10630.00
11	22756.26	100.68	0.697	0.30(0.30)	0.99	37375.4	12330.00
12	22679.22	107.26	0.679	0.30(0.30)	0.99	40514.1	11600.00
13	22452.67	112.96	0.663	0.30(0.30)	0.99	42746.5	11111.00
14	22182.32	119.02	0.647	0.30(0.30)	0.99	44682.7	12201.00
15	21478.72	127.75	0.631	0.30(0.30)	0.99	46770.4	12231.00
16	20818.70	135.05	0.618	0.30(0.30)	0.99	48183.8	10400.00
17	20413.31	138.90	0.612	0.30(0.30)	0.99	48773.8	10200.00
18	19751.84	146.12	0.599	0.30(0.30)	0.99	49800.9	10320.00
19	19183.87	150.83	0.591	0.30(0.30)	0.99	50028.8	10210.00
20	18701.11	155.51	0.583	0.30(0.30)	0.99	50190.3	12000.00
21	16142.53	183.77	0.538	0.30(0.30)	0.99	50808.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	218.01	27.26	1.340	0.30(0.30)	0.98	231.4	31600.00

LONGEST FLOWPATH FROM NODE 31600.00 TO NODE 12720.00 = 7759.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13448.24	19.77	1.626	0.30(0.30)	0.99	4606.0	40500.00
2	14472.40	24.00	1.447	0.30(0.30)	0.99	5813.7	40440.00
3	14564.34	24.54	1.425	0.30(0.30)	0.99	5984.9	12710.00
4	15007.60	27.26	1.340	0.30(0.30)	0.99	6819.1	31600.00
5	15358.36	29.53	1.275	0.30(0.30)	0.99	7495.0	31810.00
6	17156.01	43.34	1.040	0.30(0.30)	0.99	11971.2	40100.00
7	18096.15	54.23	0.924	0.30(0.30)	0.99	15237.4	11801.00
8	19479.01	68.22	0.834	0.30(0.30)	0.99	20230.1	11530.00
9	20416.98	76.63	0.793	0.30(0.30)	0.99	24095.2	11900.00
10	22002.81	86.72	0.743	0.30(0.30)	0.99	29928.4	11330.00
11	22903.19	95.11	0.713	0.30(0.30)	0.99	35013.0	10630.00
12	22840.16	100.68	0.697	0.30(0.30)	0.99	37606.8	12330.00
13	22759.33	107.26	0.679	0.30(0.30)	0.99	40745.5	11600.00
14	22529.49	112.96	0.663	0.30(0.30)	0.99	42977.9	11111.00
15	22255.64	119.02	0.647	0.30(0.30)	0.99	44914.1	12201.00
16	21548.71	127.75	0.631	0.30(0.30)	0.99	47001.8	12231.00
17	20886.07	135.05	0.618	0.30(0.30)	0.99	48415.2	10400.00
18	20479.31	138.90	0.612	0.30(0.30)	0.99	49005.2	10200.00
19	19815.25	146.12	0.599	0.30(0.30)	0.99	50032.3	10320.00
20	19245.58	150.83	0.591	0.30(0.30)	0.99	50260.2	10210.00
21	18761.15	155.51	0.583	0.30(0.30)	0.99	50421.7	12000.00
22	16193.19	183.77	0.538	0.30(0.30)	0.99	51039.5	10100.00

TOTAL AREA(ACRES) = 51039.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 22903.19 Tc(MIN.) = 95.114
EFFECTIVE AREA(ACRES) = 35013.00 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51039.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.50 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 275.00 DOWNSTREAM(FEET) = 258.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2669.21 CHANNEL SLOPE = 0.0064
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.24
CHANNEL FLOW THRU SUBAREA(CFS) = 22903.19
FLOW VELOCITY(FEET/SEC.) = 13.40 FLOW DEPTH(FEET) = 7.24
TRAVEL TIME(MIN.) = 3.32 Tc(MIN.) = 98.43
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13448.24	23.76	1.457	0.30(0.30)	0.99	4606.0	40500.00
2	14472.40	27.89	1.322	0.30(0.30)	0.99	5813.7	40440.00
3	14564.34	28.42	1.307	0.30(0.30)	0.99	5984.9	12710.00
4	15007.60	31.10	1.241	0.30(0.30)	0.99	6819.1	31600.00
5	15358.36	33.34	1.200	0.30(0.30)	0.99	7495.0	31810.00
6	17156.01	47.00	0.996	0.30(0.30)	0.99	11971.2	40100.00
7	18096.15	57.83	0.893	0.30(0.30)	0.99	15237.4	11801.00
8	19479.01	71.72	0.817	0.30(0.30)	0.99	20230.1	11530.00
9	20416.98	80.08	0.776	0.30(0.30)	0.99	24095.2	11900.00
10	22002.81	90.08	0.727	0.30(0.30)	0.99	29928.4	11330.00
11	22903.19	98.43	0.704	0.30(0.30)	0.99	35013.0	10630.00
12	22840.16	104.00	0.688	0.30(0.30)	0.99	37606.8	12330.00
13	22759.33	110.59	0.670	0.30(0.30)	0.99	40745.5	11600.00
14	22529.49	116.30	0.654	0.30(0.30)	0.99	42977.9	11111.00
15	22255.64	122.38	0.640	0.30(0.30)	0.99	44914.1	12201.00
16	21548.71	131.14	0.625	0.30(0.30)	0.99	47001.8	12231.00
17	20886.07	138.48	0.612	0.30(0.30)	0.99	48415.2	10400.00
18	20479.31	142.34	0.606	0.30(0.30)	0.99	49005.2	10200.00
19	19815.25	149.61	0.593	0.30(0.30)	0.99	50032.3	10320.00
20	19245.58	154.35	0.585	0.30(0.30)	0.99	50260.2	10210.00
21	18761.15	159.06	0.577	0.30(0.30)	0.99	50421.7	12000.00
22	16193.19	187.51	0.535	0.30(0.30)	0.99	51039.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 22903.19 Tc(MIN.) = 98.43
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 35013.00

****
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<

==========

****
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610315V.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.49	25.35	0.30(0.25)	0.83	68.1	31500.00

TOTAL AREA(ACRES) = 68.1

****
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13448.24	23.76	1.457	0.30(0.30)	0.99	4606.0	40500.00
2	14472.40	27.89	1.322	0.30(0.30)	0.99	5813.7	40440.00
3	14564.34	28.42	1.307	0.30(0.30)	0.99	5984.9	12710.00
4	15007.60	31.10	1.241	0.30(0.30)	0.99	6819.1	31600.00
5	15358.36	33.34	1.200	0.30(0.30)	0.99	7495.0	31810.00
6	17156.01	47.00	0.996	0.30(0.30)	0.99	11971.2	40100.00
7	18096.15	57.83	0.893	0.30(0.30)	0.99	15237.4	11801.00
8	19479.01	71.72	0.817	0.30(0.30)	0.99	20230.1	11530.00
9	20416.98	80.08	0.776	0.30(0.30)	0.99	24095.2	11900.00
10	22002.81	90.08	0.727	0.30(0.30)	0.99	29928.4	11330.00
11	22903.19	98.43	0.704	0.30(0.30)	0.99	35013.0	10630.00
12	22840.16	104.00	0.688	0.30(0.30)	0.99	37606.8	12330.00
13	22759.33	110.59	0.670	0.30(0.30)	0.99	40745.5	11600.00
14	22529.49	116.30	0.654	0.30(0.30)	0.99	42977.9	11111.00
15	22255.64	122.38	0.640	0.30(0.30)	0.99	44914.1	12201.00
16	21548.71	131.14	0.625	0.30(0.30)	0.99	47001.8	12231.00
17	20886.07	138.48	0.612	0.30(0.30)	0.99	48415.2	10400.00
18	20479.31	142.34	0.606	0.30(0.30)	0.99	49005.2	10200.00
19	19815.25	149.61	0.593	0.30(0.30)	0.99	50032.3	10320.00
20	19245.58	154.35	0.585	0.30(0.30)	0.99	50260.2	10210.00
21	18761.15	159.06	0.577	0.30(0.30)	0.99	50421.7	12000.00
22	16193.19	187.51	0.535	0.30(0.30)	0.99	51039.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.49	25.35	1.396	0.30(0.25)	0.83	68.1	31500.00

LONGEST FLOWPATH FROM NODE 31500.00 TO NODE 12720.50 = 4043.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13517.85	23.76	1.457	0.30(0.30)	0.99	4669.8	40500.00
2	13912.27	25.35	1.396	0.30(0.30)	0.99	5138.1	31500.00

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      3    14538.36   27.89    1.322  0.30( 0.30) 0.99    5881.8   40440.00
      4    14629.35   28.42    1.307  0.30( 0.30) 0.99    6053.0   12710.00
      5    15068.57   31.10    1.241  0.30( 0.30) 0.99    6887.2   31600.00
      6    15416.83   33.34    1.200  0.30( 0.30) 0.99    7563.1   31810.00
      7    17201.97   47.00    0.996  0.30( 0.30) 0.99   12039.3   40100.00
      8    18135.76   57.83    0.893  0.30( 0.30) 0.99   15305.5   11801.00
      9    19513.93   71.72    0.817  0.30( 0.30) 0.99   20298.2   11530.00
     10    20449.38   80.08    0.776  0.30( 0.30) 0.99   24163.3   11900.00
     11    22032.21   90.08    0.727  0.30( 0.30) 0.99   29996.5   11330.00
     12    22931.17   98.43    0.704  0.30( 0.30) 0.99   35081.1   10630.00
     13    22867.20  104.00    0.688  0.30( 0.30) 0.99   37674.9   12330.00
     14    22785.25  110.59    0.670  0.30( 0.30) 0.99   40813.6   11600.00
     15    22554.44  116.30    0.654  0.30( 0.30) 0.99   43046.0   11111.00
     16    22279.71  122.38    0.640  0.30( 0.30) 0.99   44982.2   12201.00
     17    21571.86  131.14    0.625  0.30( 0.30) 0.99   47069.9   12231.00
     18    20908.45  138.48    0.612  0.30( 0.30) 0.99   48483.3   10400.00
     19    20501.28  142.34    0.606  0.30( 0.30) 0.99   49073.3   10200.00
     20    19836.45  149.61    0.593  0.30( 0.30) 0.99   50100.4   10320.00
     21    19266.29  154.35    0.585  0.30( 0.30) 0.99   50328.3   10210.00
     22    18781.36  159.06    0.577  0.30( 0.30) 0.99   50489.8   12000.00
     23    16210.83  187.51    0.535  0.30( 0.30) 0.99   51107.6   10100.00
   TOTAL AREA(ACRES) =     51107.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    22931.17  Tc(MIN.) =   98.434
  EFFECTIVE AREA(ACRES) =  35081.09  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51107.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    256.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   438.77   CHANNEL SLOPE =  0.0046
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.97
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.702
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.15      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22942.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.00
  AVERAGE FLOW DEPTH(FEET) =   7.97   TRAVEL TIME(MIN.) =   0.61
  Tc(MIN.) =   99.04
  SUBAREA AREA(ACRES) =    62.15       SUBAREA RUNOFF(CFS) =   22.49
  EFFECTIVE AREA(ACRES) =  35143.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    51169.7         PEAK FLOW RATE(CFS) =   22931.17
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.97   FLOW VELOCITY(FEET/SEC.) =  12.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12721.00 =  109120.82 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13517.85   24.49    1.427  0.30( 0.30) 0.99    4732.0   40500.00
      2    13912.27   26.07    1.375  0.30( 0.30) 0.99    5200.3   31500.00
      3    14538.36   28.60    1.302  0.30( 0.30) 0.99    5943.9   40440.00
      4    14629.35   29.13    1.286  0.30( 0.30) 0.99    6115.2   12710.00
      5    15068.57   31.80    1.228  0.30( 0.30) 0.99    6949.3   31600.00
      6    15416.83   34.03    1.188  0.30( 0.30) 0.99    7625.2   31810.00
      7    17201.97   47.67    0.988  0.30( 0.30) 0.99   12101.5   40100.00
      8    18135.76   58.49    0.887  0.30( 0.30) 0.99   15367.6   11801.00
      9    19513.93   72.37    0.813  0.30( 0.30) 0.99   20360.4   11530.00
     10    20449.38   80.71    0.773  0.30( 0.30) 0.99   24225.5   11900.00
     11    22032.21   90.70    0.725  0.30( 0.30) 0.99   30058.7   11330.00
     12    22931.17   99.04    0.702  0.30( 0.30) 0.99   35143.2   10630.00
     13    22867.20  104.61    0.687  0.30( 0.30) 0.99   37737.1   12330.00
     14    22785.25  111.20    0.668  0.30( 0.30) 0.99   40875.7   11600.00
     15    22554.44  116.91    0.653  0.30( 0.30) 0.99   43108.1   11111.00
     16    22279.71  122.99    0.639  0.30( 0.30) 0.99   45044.4   12201.00
     17    21571.86  131.76    0.624  0.30( 0.30) 0.99   47132.1   12231.00
     18    20908.45  139.11    0.611  0.30( 0.30) 0.99   48545.4   10400.00
     19    20501.28  142.98    0.605  0.30( 0.30) 0.99   49135.5   10200.00
     20    19836.45  150.25    0.592  0.30( 0.30) 0.99   50162.6   10320.00
     21    19266.29  155.00    0.584  0.30( 0.30) 0.99   50390.5   10210.00
     22    18781.36  159.71    0.576  0.30( 0.30) 0.99   50551.9   12000.00
     23    16210.83  188.19    0.535  0.30( 0.30) 0.99   51169.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   22931.17  Tc(MIN.) =   99.04
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   35143.24

****************************************************************************
  FLOW PROCESS FROM NODE  12721.00 TO NODE  12722.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    256.00  DOWNSTREAM(FEET) =    255.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.42   CHANNEL SLOPE =  0.0012
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.61
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.697
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22933.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.66
```

AVERAGE FLOW DEPTH(FEET) = 11.60 TRAVEL TIME(MIN.) = 1.81
Tc(MIN.) = 100.85
SUBAREA AREA(ACRES) = 11.24 SUBAREA RUNOFF(CFS) = 4.02
EFFECTIVE AREA(ACRES) = 35154.48 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51180.9 PEAK FLOW RATE(CFS) = 22931.17
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.60 FLOW VELOCITY(FEET/SEC.) = 7.66
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13517.85	26.63	1.359	0.30(0.30)	0.99	4743.2	40500.00
2	13912.27	28.19	1.313	0.30(0.30)	0.99	5211.5	31500.00
3	14538.36	30.70	1.248	0.30(0.30)	0.99	5955.2	40440.00
4	14629.35	31.22	1.239	0.30(0.30)	0.99	6126.4	12710.00
5	15068.57	33.87	1.191	0.30(0.30)	0.99	6960.6	31600.00
6	15416.83	36.09	1.150	0.30(0.30)	0.99	7636.5	31810.00
7	17201.97	49.65	0.965	0.30(0.30)	0.99	12112.7	40100.00
8	18135.76	60.44	0.872	0.30(0.30)	0.99	15378.9	11801.00
9	19513.93	74.27	0.804	0.30(0.30)	0.99	20371.6	11530.00
10	20449.38	82.59	0.763	0.30(0.30)	0.99	24236.7	11900.00
11	22032.21	92.53	0.720	0.30(0.30)	0.99	30069.9	11330.00
12	22931.17	100.85	0.697	0.30(0.30)	0.99	35154.5	10630.00
13	22867.20	106.42	0.682	0.30(0.30)	0.99	37748.3	12330.00
14	22785.25	113.01	0.663	0.30(0.30)	0.99	40886.9	11600.00
15	22554.44	118.73	0.648	0.30(0.30)	0.99	43119.4	11111.00
16	22279.71	124.81	0.636	0.30(0.30)	0.99	45055.6	12201.00
17	21571.86	133.60	0.621	0.30(0.30)	0.99	47143.3	12231.00
18	20908.45	140.97	0.608	0.30(0.30)	0.99	48556.6	10400.00
19	20501.28	144.85	0.601	0.30(0.30)	0.99	49146.7	10200.00
20	19836.45	152.14	0.589	0.30(0.30)	0.99	50173.8	10320.00
21	19266.29	156.91	0.581	0.30(0.30)	0.99	50401.7	10210.00
22	18781.36	161.64	0.573	0.30(0.30)	0.99	50563.2	12000.00
23	16210.83	190.21	0.533	0.30(0.30)	0.99	51180.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 22931.17 Tc(MIN.) = 100.85
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 35154.48

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610314V.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	354.55	39.55	0.30(0.30)	0.99	497.2	31400.00

TOTAL AREA(ACRES) = 497.2

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13517.85	26.63	1.359	0.30(0.30)	0.99	4743.2	40500.00
2	13912.27	28.19	1.313	0.30(0.30)	0.99	5211.5	31500.00
3	14538.36	30.70	1.248	0.30(0.30)	0.99	5955.2	40440.00
4	14629.35	31.22	1.239	0.30(0.30)	0.99	6126.4	12710.00
5	15068.57	33.87	1.191	0.30(0.30)	0.99	6960.6	31600.00
6	15416.83	36.09	1.150	0.30(0.30)	0.99	7636.5	31810.00
7	17201.97	49.65	0.965	0.30(0.30)	0.99	12112.7	40100.00
8	18135.76	60.44	0.872	0.30(0.30)	0.99	15378.9	11801.00
9	19513.93	74.27	0.804	0.30(0.30)	0.99	20371.6	11530.00
10	20449.38	82.59	0.763	0.30(0.30)	0.99	24236.7	11900.00
11	22032.21	92.53	0.720	0.30(0.30)	0.99	30069.9	11330.00
12	22931.17	100.85	0.697	0.30(0.30)	0.99	35154.5	10630.00
13	22867.20	106.42	0.682	0.30(0.30)	0.99	37748.3	12330.00
14	22785.25	113.01	0.663	0.30(0.30)	0.99	40886.9	11600.00
15	22554.44	118.73	0.648	0.30(0.30)	0.99	43119.4	11111.00
16	22279.71	124.81	0.636	0.30(0.30)	0.99	45055.6	12201.00
17	21571.86	133.60	0.621	0.30(0.30)	0.99	47143.3	12231.00
18	20908.45	140.97	0.608	0.30(0.30)	0.99	48556.6	10400.00
19	20501.28	144.85	0.601	0.30(0.30)	0.99	49146.7	10200.00
20	19836.45	152.14	0.589	0.30(0.30)	0.99	50173.8	10320.00
21	19266.29	156.91	0.581	0.30(0.30)	0.99	50401.7	10210.00
22	18781.36	161.64	0.573	0.30(0.30)	0.99	50563.2	12000.00
23	16210.83	190.21	0.533	0.30(0.30)	0.99	51180.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	354.55	39.55	1.087	0.30(0.30)	0.99	497.2	31400.00

LONGEST FLOWPATH FROM NODE 31400.00 TO NODE 12722.00 = 14614.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13838.62	26.63	1.359	0.30(0.30)	0.99	5078.0	40500.00
2	14237.37	28.19	1.313	0.30(0.30)	0.99	5566.0	31500.00
3	14869.65	30.70	1.248	0.30(0.30)	0.99	6341.1	40440.00
4	14962.93	31.22	1.239	0.30(0.30)	0.99	6518.9	12710.00
5	15411.93	33.87	1.191	0.30(0.30)	0.99	7386.4	31600.00
6	15766.15	36.09	1.150	0.30(0.30)	0.99	8090.1	31810.00
7	16226.77	39.55	1.087	0.30(0.30)	0.99	9275.5	31400.00
8	17501.73	49.65	0.965	0.30(0.30)	0.99	12609.9	40100.00
9	18393.67	60.44	0.872	0.30(0.30)	0.99	15876.0	11801.00
10	19741.43	74.27	0.804	0.30(0.30)	0.99	20868.8	11530.00
11	20658.60	82.59	0.763	0.30(0.30)	0.99	24733.9	11900.00
12	22222.00	92.53	0.720	0.30(0.30)	0.99	30567.1	11330.00
13	23110.63	100.85	0.697	0.30(0.30)	0.99	35651.7	10630.00
14	23039.74	106.42	0.682	0.30(0.30)	0.99	38245.5	12330.00
15	22949.62	113.01	0.663	0.30(0.30)	0.99	41384.1	11600.00

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    16    22711.70  118.73    0.648  0.30( 0.30) 0.99   43616.6   11111.00
    17    22431.69  124.81    0.636  0.30( 0.30) 0.99   45552.8   12201.00
    18    21717.06  133.60    0.621  0.30( 0.30) 0.99   47640.5   12231.00
    19    21047.98  140.97    0.608  0.30( 0.30) 0.99   49053.8   10400.00
    20    20637.82  144.85    0.601  0.30( 0.30) 0.99   49643.9   10200.00
    21    19967.38  152.14    0.589  0.30( 0.30) 0.99   50671.0   10320.00
    22    19393.54  156.91    0.581  0.30( 0.30) 0.99   50898.9   10210.00
    23    18904.97  161.64    0.573  0.30( 0.30) 0.99   51060.4   12000.00
    24    16316.74  190.21    0.533  0.30( 0.30) 0.99   51678.1   10100.00
  TOTAL AREA(ACRES) =     51678.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    23110.63  Tc(MIN.) =  100.850
 EFFECTIVE AREA(ACRES) =  35651.68  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    51678.1
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12722.00 =  109951.24 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    255.00  DOWNSTREAM(FEET) =    252.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =   624.00   CHANNEL SLOPE =  0.0046
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.96
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.695
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       62.42      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   23121.71
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.11
 AVERAGE FLOW DEPTH(FEET) =   7.96   TRAVEL TIME(MIN.) =   0.86
 Tc(MIN.) =  101.71
 SUBAREA AREA(ACRES) =    62.42       SUBAREA RUNOFF(CFS) =   22.17
 EFFECTIVE AREA(ACRES) =  35714.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =    51740.6         PEAK FLOW RATE(CFS) =   23110.63
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.96

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.96   FLOW VELOCITY(FEET/SEC.) =  12.11
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12740.00 =  110575.24 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    13838.62   27.65    1.329  0.30( 0.30) 0.99    5140.4   40500.00
     2    14237.37   29.20    1.284  0.30( 0.30) 0.99    5628.4   31500.00
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     3    14869.65   31.69    1.230  0.30( 0.30) 0.99    6403.5   40440.00
     4    14962.93   32.21    1.221  0.30( 0.30) 0.99    6581.3   12710.00
     5    15411.93   34.86    1.173  0.30( 0.30) 0.99    7448.8   31600.00
     6    15766.15   37.06    1.132  0.30( 0.30) 0.99    8152.6   31810.00
     7    16226.77   40.51    1.073  0.30( 0.30) 0.99    9338.0   31400.00
     8    17501.73   50.59    0.956  0.30( 0.30) 0.99   12672.3   40100.00
     9    18393.67   61.36    0.867  0.30( 0.30) 0.99   15938.5   11801.00
    10    19741.43   75.18    0.800  0.30( 0.30) 0.99   20931.2   11530.00
    11    20658.60   83.48    0.759  0.30( 0.30) 0.99   24796.3   11900.00
    12    22222.00   93.40    0.718  0.30( 0.30) 0.99   30629.5   11330.00
    13    23110.63  101.71    0.695  0.30( 0.30) 0.99   35714.1   10630.00
    14    23039.74  107.28    0.679  0.30( 0.30) 0.99   38307.9   12330.00
    15    22949.62  113.87    0.661  0.30( 0.30) 0.99   41446.6   11600.00
    16    22711.70  119.59    0.645  0.30( 0.30) 0.99   43679.0   11111.00
    17    22431.69  125.68    0.634  0.30( 0.30) 0.99   45615.2   12201.00
    18    21717.06  134.48    0.619  0.30( 0.30) 0.99   47702.9   12231.00
    19    21047.98  141.85    0.606  0.30( 0.30) 0.99   49116.3   10400.00
    20    20637.82  145.74    0.600  0.30( 0.30) 0.99   49706.3   10200.00
    21    19967.38  153.04    0.587  0.30( 0.30) 0.99   50733.4   10320.00
    22    19393.54  157.82    0.579  0.30( 0.30) 0.99   50961.3   10210.00
    23    18904.97  162.56    0.571  0.30( 0.30) 0.99   51122.8   12000.00
    24    16316.74  191.18    0.532  0.30( 0.30) 0.99   51740.6   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =   23110.63  Tc(MIN.) =  101.71
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   35714.10

****************************************************************************
 FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  101.71
 RAINFALL INTENSITY(INCH/HR) =   0.69
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99
 EFFECTIVE STREAM AREA(ACRES) =   35714.10
 TOTAL STREAM AREA(ACRES) =   51740.56
 PEAK FLOW RATE(CFS) AT CONFLUENCE =   23110.63

****************************************************************************
 FLOW PROCESS FROM NODE  12730.00 TO NODE  12731.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   561.54
 ELEVATION DATA: UPSTREAM(FEET) =    613.29  DOWNSTREAM(FEET) =    551.75

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.823
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.045
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        6.33      0.30     1.000     0   13.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.94
  TOTAL AREA(ACRES) =      6.33   PEAK FLOW RATE(CFS) =      9.94

****************************************************************************
  FLOW PROCESS FROM NODE  12731.00 TO NODE  12732.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    551.75  DOWNSTREAM(FEET) =    494.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   971.91   CHANNEL SLOPE =  0.0590
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.73
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.741
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.24
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   17.64
  SUBAREA AREA(ACRES) =    34.62       SUBAREA RUNOFF(CFS) =   44.89
  EFFECTIVE AREA(ACRES) =     40.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.9         PEAK FLOW RATE(CFS) =      53.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   5.02
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12732.00 =    1533.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12732.00 TO NODE  12733.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    494.40  DOWNSTREAM(FEET) =    431.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1156.41   CHANNEL SLOPE =  0.0548
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.571
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      87.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.73
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   21.01
  SUBAREA AREA(ACRES) =    59.52       SUBAREA RUNOFF(CFS) =   68.10
  EFFECTIVE AREA(ACRES) =    100.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.5         PEAK FLOW RATE(CFS) =     114.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOW VELOCITY(FEET/SEC.) =   6.25
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12733.00 =    2689.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12733.00 TO NODE  12734.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    431.00  DOWNSTREAM(FEET) =    367.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1654.48   CHANNEL SLOPE =  0.0386
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.84
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.388
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       64.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     146.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.96
  AVERAGE FLOW DEPTH(FEET) =   1.80   TRAVEL TIME(MIN.) =   4.62
  Tc(MIN.) =   25.63
  SUBAREA AREA(ACRES) =    64.05       SUBAREA RUNOFF(CFS) =   62.70
  EFFECTIVE AREA(ACRES) =    164.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      164.5         PEAK FLOW RATE(CFS) =     161.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.90   FLOW VELOCITY(FEET/SEC.) =   6.13
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12734.00 =    4344.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    367.11  DOWNSTREAM(FEET) =    252.10
```

CHANNEL LENGTH THRU SUBAREA(FEET) = 1880.98 CHANNEL SLOPE = 0.0611
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.74
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.264
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.02	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 172.35
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.37
AVERAGE FLOW DEPTH(FEET) = 1.74 TRAVEL TIME(MIN.) = 4.26
Tc(MIN.) = 29.89
SUBAREA AREA(ACRES) = 26.02 SUBAREA RUNOFF(CFS) = 22.58
EFFECTIVE AREA(ACRES) = 190.54 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 190.5 PEAK FLOW RATE(CFS) = 165.36
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.70 FLOW VELOCITY(FEET/SEC.) = 7.27
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12740.00 = 6225.32 FEET.

****
FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 29.89
RAINFALL INTENSITY(INCH/HR) = 1.26
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 190.54
TOTAL STREAM AREA(ACRES) = 190.54
PEAK FLOW RATE(CFS) AT CONFLUENCE = 165.36

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13838.62	27.65	1.329	0.30(0.30)	0.99	5140.4	40500.00
1	14237.37	29.20	1.284	0.30(0.30)	0.99	5628.4	31500.00
1	14869.65	31.69	1.230	0.30(0.30)	0.99	6403.5	40440.00
1	14962.93	32.21	1.221	0.30(0.30)	0.99	6581.3	12710.00
1	15411.93	34.86	1.173	0.30(0.30)	0.99	7448.8	31600.00
1	15766.15	37.06	1.132	0.30(0.30)	0.99	8152.6	31810.00
1	16226.77	40.51	1.073	0.30(0.30)	0.99	9338.0	31400.00
1	17501.73	50.59	0.956	0.30(0.30)	0.99	12672.3	40100.00
1	18393.67	61.36	0.867	0.30(0.30)	0.99	15938.5	11801.00
1	19741.43	75.18	0.800	0.30(0.30)	0.99	20931.2	11530.00
1	20658.60	83.48	0.759	0.30(0.30)	0.99	24796.3	11900.00
1	22222.00	93.40	0.718	0.30(0.30)	0.99	30629.5	11330.00
1	23110.63	101.71	0.695	0.30(0.30)	0.99	35714.1	10630.00
1	23039.74	107.28	0.679	0.30(0.30)	0.99	38307.9	12330.00
1	22949.62	113.87	0.661	0.30(0.30)	0.99	41446.6	11600.00
1	22711.70	119.59	0.645	0.30(0.30)	0.99	43679.0	11111.00
1	22431.69	125.68	0.634	0.30(0.30)	0.99	45615.2	12201.00
1	21717.06	134.48	0.619	0.30(0.30)	0.99	47702.9	12231.00
1	21047.98	141.85	0.606	0.30(0.30)	0.99	49116.3	10400.00
1	20637.82	145.74	0.600	0.30(0.30)	0.99	49706.3	10200.00
1	19967.38	153.04	0.587	0.30(0.30)	0.99	50733.4	10320.00
1	19393.54	157.82	0.579	0.30(0.30)	0.99	50961.3	10210.00
1	18904.97	162.56	0.571	0.30(0.30)	0.99	51122.8	12000.00
1	16316.74	191.18	0.532	0.30(0.30)	0.99	51740.6	10100.00
2	165.36	29.89	1.264	0.30(0.30)	1.00	190.5	12730.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14001.89	27.65	1.329	0.30(0.30)	0.99	5316.7	40500.00
2	14402.26	29.20	1.284	0.30(0.30)	0.99	5814.6	31500.00
3	14576.85	29.89	1.264	0.30(0.30)	0.99	6032.4	12730.00
4	15029.18	31.69	1.230	0.30(0.30)	0.99	6594.0	40440.00
5	15120.83	32.21	1.221	0.30(0.30)	0.99	6771.9	12710.00
6	15561.58	34.86	1.173	0.30(0.30)	0.99	7639.4	31600.00
7	15908.91	37.06	1.132	0.30(0.30)	0.99	8343.1	31810.00
8	16359.33	40.51	1.073	0.30(0.30)	0.99	9528.5	31400.00
9	17614.20	50.59	0.956	0.30(0.30)	0.99	12862.9	40100.00
10	18490.97	61.36	0.867	0.30(0.30)	0.99	16129.0	11801.00
11	19827.12	75.18	0.800	0.30(0.30)	0.99	21121.8	11530.00
12	20737.31	83.48	0.759	0.30(0.30)	0.99	24986.9	11900.00
13	22293.62	93.40	0.718	0.30(0.30)	0.99	30820.1	11330.00
14	23178.31	101.71	0.695	0.30(0.30)	0.99	35904.6	10630.00
15	23104.78	107.28	0.679	0.30(0.30)	0.99	38498.5	12330.00
16	23011.53	113.87	0.661	0.30(0.30)	0.99	41637.1	11600.00
17	22770.89	119.59	0.645	0.30(0.30)	0.99	43869.5	11111.00
18	22489.02	125.68	0.634	0.30(0.30)	0.99	45805.8	12201.00
19	21771.80	134.48	0.619	0.30(0.30)	0.99	47893.5	12231.00
20	21100.55	141.85	0.606	0.30(0.30)	0.99	49306.8	10400.00
21	20689.25	145.74	0.600	0.30(0.30)	0.99	49896.9	10200.00
22	20016.65	153.04	0.587	0.30(0.30)	0.99	50924.0	10320.00
23	19441.41	157.82	0.579	0.30(0.30)	0.99	51151.9	10210.00
24	18951.45	162.56	0.571	0.30(0.30)	0.99	51313.3	12000.00
25	16356.59	191.18	0.532	0.30(0.30)	0.99	51931.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 23178.31 Tc(MIN.) = 101.71
EFFECTIVE AREA(ACRES) = 35904.64 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51931.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

****
FLOW PROCESS FROM NODE 12740.00 TO NODE 12741.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    252.10  DOWNSTREAM(FEET) =    247.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   401.47   CHANNEL SLOPE =  0.0127
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.97
  CHANNEL FLOW THRU SUBAREA(CFS) =   23178.31
  FLOW VELOCITY(FEET/SEC.) =  16.89   FLOW DEPTH(FEET) =   5.97
  TRAVEL TIME(MIN.) =   0.40   Tc(MIN.) =  102.10
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14001.89   28.13    1.315  0.30( 0.30) 0.99    5316.7   40500.00
      2    14402.26   29.67    1.271  0.30( 0.30) 0.99    5814.6   31500.00
      3    14576.85   30.36    1.255  0.30( 0.30) 0.99    6032.4   12730.00
      4    15029.18   32.15    1.222  0.30( 0.30) 0.99    6594.0   40440.00
      5    15120.83   32.67    1.212  0.30( 0.30) 0.99    6771.9   12710.00
      6    15561.58   35.31    1.164  0.30( 0.30) 0.99    7639.4   31600.00
      7    15908.91   37.52    1.124  0.30( 0.30) 0.99    8343.1   31810.00
      8    16359.33   40.96    1.068  0.30( 0.30) 0.99    9528.5   31400.00
      9    17614.20   51.03    0.952  0.30( 0.30) 0.99   12862.9   40100.00
     10    18490.97   61.79    0.865  0.30( 0.30) 0.99   16129.0   11801.00
     11    19827.12   75.59    0.798  0.30( 0.30) 0.99   21121.8   11530.00
     12    20737.31   83.89    0.757  0.30( 0.30) 0.99   24986.9   11900.00
     13    22293.62   93.80    0.716  0.30( 0.30) 0.99   30820.1   11330.00
     14    23178.31  102.10    0.694  0.30( 0.30) 0.99   35904.6   10630.00
     15    23104.78  107.68    0.678  0.30( 0.30) 0.99   38498.5   12330.00
     16    23011.53  114.27    0.660  0.30( 0.30) 0.99   41637.1   11600.00
     17    22770.89  119.99    0.644  0.30( 0.30) 0.99   43869.5   11111.00
     18    22489.02  126.08    0.634  0.30( 0.30) 0.99   45805.8   12201.00
     19    21771.80  134.89    0.618  0.30( 0.30) 0.99   47893.5   12231.00
     20    21100.55  142.26    0.606  0.30( 0.30) 0.99   49306.8   10400.00
     21    20689.25  146.15    0.599  0.30( 0.30) 0.99   49896.9   10200.00
     22    20016.65  153.46    0.587  0.30( 0.30) 0.99   50924.0   10320.00
     23    19441.41  158.24    0.578  0.30( 0.30) 0.99   51151.9   10210.00
     24    18951.45  162.98    0.570  0.30( 0.30) 0.99   51313.3   12000.00
     25    16356.59  191.63    0.532  0.30( 0.30) 0.99   51931.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   23178.31  Tc(MIN.) =  102.10
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   35904.64

********************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE = 15.1
--------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610313V.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
```



```
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     136.18   24.28  0.30( 0.29) 0.97     132.0   31300.00
    TOTAL AREA(ACRES) =      132.0

********************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14001.89   28.13    1.315  0.30( 0.30) 0.99    5316.7   40500.00
      2    14402.26   29.67    1.271  0.30( 0.30) 0.99    5814.6   31500.00
      3    14576.85   30.36    1.255  0.30( 0.30) 0.99    6032.4   12730.00
      4    15029.18   32.15    1.222  0.30( 0.30) 0.99    6594.0   40440.00
      5    15120.83   32.67    1.212  0.30( 0.30) 0.99    6771.9   12710.00
      6    15561.58   35.31    1.164  0.30( 0.30) 0.99    7639.4   31600.00
      7    15908.91   37.52    1.124  0.30( 0.30) 0.99    8343.1   31810.00
      8    16359.33   40.96    1.068  0.30( 0.30) 0.99    9528.5   31400.00
      9    17614.20   51.03    0.952  0.30( 0.30) 0.99   12862.9   40100.00
     10    18490.97   61.79    0.865  0.30( 0.30) 0.99   16129.0   11801.00
     11    19827.12   75.59    0.798  0.30( 0.30) 0.99   21121.8   11530.00
     12    20737.31   83.89    0.757  0.30( 0.30) 0.99   24986.9   11900.00
     13    22293.62   93.80    0.716  0.30( 0.30) 0.99   30820.1   11330.00
     14    23178.31  102.10    0.694  0.30( 0.30) 0.99   35904.6   10630.00
     15    23104.78  107.68    0.678  0.30( 0.30) 0.99   38498.5   12330.00
     16    23011.53  114.27    0.660  0.30( 0.30) 0.99   41637.1   11600.00
     17    22770.89  119.99    0.644  0.30( 0.30) 0.99   43869.5   11111.00
     18    22489.02  126.08    0.634  0.30( 0.30) 0.99   45805.8   12201.00
     19    21771.80  134.89    0.618  0.30( 0.30) 0.99   47893.5   12231.00
     20    21100.55  142.26    0.606  0.30( 0.30) 0.99   49306.8   10400.00
     21    20689.25  146.15    0.599  0.30( 0.30) 0.99   49896.9   10200.00
     22    20016.65  153.46    0.587  0.30( 0.30) 0.99   50924.0   10320.00
     23    19441.41  158.24    0.578  0.30( 0.30) 0.99   51151.9   10210.00
     24    18951.45  162.98    0.570  0.30( 0.30) 0.99   51313.3   12000.00
     25    16356.59  191.63    0.532  0.30( 0.30) 0.99   51931.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     136.18   24.28    1.436  0.30( 0.29) 0.97     132.0   31300.00
  LONGEST FLOWPATH FROM NODE  31300.00 TO NODE  12741.00 =    5775.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13653.25   24.28    1.436  0.30( 0.30) 0.99    4721.0   31300.00
      2    14123.73   28.13    1.315  0.30( 0.30) 0.99    5448.7   40500.00
      3    14518.76   29.67    1.271  0.30( 0.30) 0.99    5946.5   31500.00
      4    14691.44   30.36    1.255  0.30( 0.30) 0.99    6164.4   12730.00
      5    15139.88   32.15    1.222  0.30( 0.30) 0.99    6726.0   40440.00
      6    15230.39   32.67    1.212  0.30( 0.30) 0.99    6903.8   12710.00
      7    15665.44   35.31    1.164  0.30( 0.30) 0.99    7771.4   31600.00
      8    16007.99   37.52    1.124  0.30( 0.30) 0.99    8475.1   31810.00
```

```
      9    16451.69   40.96    1.068  0.30( 0.30) 0.99    9660.5   31400.00
     10    17692.80   51.03    0.952  0.30( 0.30) 0.99   12994.9   40100.00
     11    18559.24   61.79    0.865  0.30( 0.30) 0.99   16261.0   11801.00
     12    19887.34   75.59    0.798  0.30( 0.30) 0.99   21253.8   11530.00
     13    20792.69   83.89    0.757  0.30( 0.30) 0.99   25118.9   11900.00
     14    22344.19   93.80    0.716  0.30( 0.30) 0.99   30952.0   11330.00
     15    23226.14  102.10    0.694  0.30( 0.30) 0.99   36036.6   10630.00
     16    23150.77  107.68    0.678  0.30( 0.30) 0.99   38630.4   12330.00
     17    23055.36  114.27    0.660  0.30( 0.30) 0.99   41769.1   11600.00
     18    22812.83  119.99    0.644  0.30( 0.30) 0.99   44001.5   11111.00
     19    22529.71  126.08    0.634  0.30( 0.30) 0.99   45937.7   12201.00
     20    21810.70  134.89    0.618  0.30( 0.30) 0.99   48025.4   12231.00
     21    21137.94  142.26    0.606  0.30( 0.30) 0.99   49438.8   10400.00
     22    20725.84  146.15    0.599  0.30( 0.30) 0.99   50028.8   10200.00
     23    20051.76  153.46    0.587  0.30( 0.30) 0.99   51056.0   10320.00
     24    19475.54  158.24    0.578  0.30( 0.30) 0.99   51283.8   10210.00
     25    18984.60  162.98    0.570  0.30( 0.30) 0.99   51445.3   12000.00
     26    16385.20  191.63    0.532  0.30( 0.30) 0.99   52063.1   10100.00
   TOTAL AREA(ACRES) =     52063.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    23226.14  Tc(MIN.) =  102.105
  EFFECTIVE AREA(ACRES) =  36036.61  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    52063.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12800.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    247.00  DOWNSTREAM(FEET) =    240.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   819.00   CHANNEL SLOPE =  0.0085
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.691
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   23229.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.84
  AVERAGE FLOW DEPTH(FEET) =   6.70   TRAVEL TIME(MIN.) =   0.92
  Tc(MIN.) =  103.02
  SUBAREA AREA(ACRES) =    17.31       SUBAREA RUNOFF(CFS) =    6.09
  EFFECTIVE AREA(ACRES) =  36053.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    52080.4         PEAK FLOW RATE(CFS) =   23226.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.70
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.70   FLOW VELOCITY(FEET/SEC.) =  14.84
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13653.25   25.38    1.395  0.30( 0.30) 0.99    4738.3   31300.00
      2    14123.73   29.22    1.284  0.30( 0.30) 0.99    5466.0   40500.00
      3    14518.76   30.75    1.247  0.30( 0.30) 0.99    5963.9   31500.00
      4    14691.44   31.43    1.235  0.30( 0.30) 0.99    6181.7   12730.00
      5    15139.88   33.22    1.202  0.30( 0.30) 0.99    6743.3   40440.00
      6    15230.39   33.74    1.193  0.30( 0.30) 0.99    6921.1   12710.00
      7    15665.44   36.37    1.145  0.30( 0.30) 0.99    7788.7   31600.00
      8    16007.99   38.56    1.105  0.30( 0.30) 0.99    8492.4   31810.00
      9    16451.69   42.00    1.055  0.30( 0.30) 0.99    9677.8   31400.00
     10    17692.80   52.04    0.943  0.30( 0.30) 0.99   13012.2   40100.00
     11    18559.24   62.78    0.860  0.30( 0.30) 0.99   16278.3   11801.00
     12    19887.34   76.56    0.793  0.30( 0.30) 0.99   21271.1   11530.00
     13    20792.69   84.85    0.752  0.30( 0.30) 0.99   25136.2   11900.00
     14    22344.19   94.73    0.714  0.30( 0.30) 0.99   30969.3   11330.00
     15    23226.14  103.02    0.691  0.30( 0.30) 0.99   36053.9   10630.00
     16    23150.77  108.60    0.676  0.30( 0.30) 0.99   38647.7   12330.00
     17    23055.36  115.19    0.657  0.30( 0.30) 0.99   41786.4   11600.00
     18    22812.83  120.92    0.642  0.30( 0.30) 0.99   44018.8   11111.00
     19    22529.71  127.01    0.632  0.30( 0.30) 0.99   45955.0   12201.00
     20    21810.70  135.83    0.617  0.30( 0.30) 0.99   48042.7   12231.00
     21    21137.94  143.21    0.604  0.30( 0.30) 0.99   49456.1   10400.00
     22    20725.84  147.11    0.597  0.30( 0.30) 0.99   50046.1   10200.00
     23    20051.76  154.43    0.585  0.30( 0.30) 0.99   51073.3   10320.00
     24    19475.54  159.22    0.577  0.30( 0.30) 0.99   51301.2   10210.00
     25    18984.60  163.97    0.569  0.30( 0.30) 0.99   51462.6   12000.00
     26    16385.20  192.66    0.531  0.30( 0.30) 0.99   52080.4   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   23226.14  Tc(MIN.) =  103.02
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   36053.92
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    52080.4  TC(MIN.) =    103.02
  EFFECTIVE AREA(ACRES) =  36053.92  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.994
  PEAK FLOW RATE(CFS)   =   23226.14

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13653.25   25.38    1.395  0.30( 0.30) 0.99    4738.3   31300.00
      2    14123.73   29.22    1.284  0.30( 0.30) 0.99    5466.0   40500.00
      3    14518.76   30.75    1.247  0.30( 0.30) 0.99    5963.9   31500.00
      4    14691.44   31.43    1.235  0.30( 0.30) 0.99    6181.7   12730.00
      5    15139.88   33.22    1.202  0.30( 0.30) 0.99    6743.3   40440.00
      6    15230.39   33.74    1.193  0.30( 0.30) 0.99    6921.1   12710.00
      7    15665.44   36.37    1.145  0.30( 0.30) 0.99    7788.7   31600.00
      8    16007.99   38.56    1.105  0.30( 0.30) 0.99    8492.4   31810.00
      9    16451.69   42.00    1.055  0.30( 0.30) 0.99    9677.8   31400.00
     10    17692.80   52.04    0.943  0.30( 0.30) 0.99   13012.2   40100.00
     11    18559.24   62.78    0.860  0.30( 0.30) 0.99   16278.3   11801.00
```

12	19887.34	76.56	0.793	0.30(0.30)	0.99	21271.1	11530.00
13	20792.69	84.85	0.752	0.30(0.30)	0.99	25136.2	11900.00
14	22344.19	94.73	0.714	0.30(0.30)	0.99	30969.3	11330.00
15	23226.14	103.02	0.691	0.30(0.30)	0.99	36053.9	10630.00
16	23150.77	108.60	0.676	0.30(0.30)	0.99	38647.7	12330.00
17	23055.36	115.19	0.657	0.30(0.30)	0.99	41786.4	11600.00
18	22812.83	120.92	0.642	0.30(0.30)	0.99	44018.8	11111.00
19	22529.71	127.01	0.632	0.30(0.30)	0.99	45955.0	12201.00
20	21810.70	135.83	0.617	0.30(0.30)	0.99	48042.7	12231.00
21	21137.94	143.21	0.604	0.30(0.30)	0.99	49456.1	10400.00
22	20725.84	147.11	0.597	0.30(0.30)	0.99	50046.1	10200.00
23	20051.76	154.43	0.585	0.30(0.30)	0.99	51073.3	10320.00
24	19475.54	159.22	0.577	0.30(0.30)	0.99	51301.2	10210.00
25	18984.60	163.97	0.569	0.30(0.30)	0.99	51462.6	12000.00
26	16385.20	192.66	0.531	0.30(0.30)	0.99	52080.4	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S28.DAT
  TIME/DATE OF STUDY: 08:59 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.872
   2)   10.00;  2.570
   3)   15.00;  1.884
   4)   20.00;  1.613
   5)   25.00;  1.406
   6)   30.00;  1.261
   7)   40.00;  1.079
   8)   50.00;  0.961
   9)   60.00;  0.874
  10)   90.00;  0.727
  11)  120.00;  0.644
  12)  180.00;  0.541
  13)  360.00;  0.401
  14) 1200.00;  0.176
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610501V.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      980.25   27.73  0.30( 0.29) 0.98    1026.3   50120.00
      2      957.41   29.15  0.30( 0.29) 0.98    1042.7   50150.00
      3      896.35   32.55  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      980.25   27.73  0.30( 0.29) 0.98    1026.3   50120.00
      2      957.41   29.15  0.30( 0.29) 0.98    1042.7   50150.00
      3      896.35   32.55  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =      1063.4
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1063.4  TC(MIN.) =     27.73
  EFFECTIVE AREA(ACRES) =   1026.35  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.981
  PEAK FLOW RATE(CFS)   =     980.25

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      980.25   27.73    1.327  0.30( 0.29) 0.98    1026.3   50120.00
      2      957.41   29.15    1.286  0.30( 0.29) 0.98    1042.7   50150.00
      3      896.35   32.55    1.215  0.30( 0.29) 0.98    1063.4   50100.00
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S29.DAT
  TIME/DATE OF STUDY: 09:00 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.858
   2)   10.00;  2.563
   3)   15.00;  1.881
   4)   20.00;  1.610
   5)   25.00;  1.404
   6)   30.00;  1.259
   7)   40.00;  1.078
   8)   50.00;  0.960
   9)   60.00;  0.872
  10)   90.00;  0.725
  11)  120.00;  0.642
  12)  180.00;  0.539
  13)  360.00;  0.399
  14) 1200.00;  0.175
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S27.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    13653.25   25.38  0.30( 0.30) 0.99    4738.3   31300.00
      2    15230.39   33.74  0.30( 0.30) 0.99    6921.1   12710.00
      3    16451.69   42.00  0.30( 0.30) 0.99    9677.8   31400.00
      4    17692.80   52.04  0.30( 0.30) 0.99   13012.2   40100.00
      5    18559.24   62.78  0.30( 0.30) 0.99   16278.3   11801.00
      6    19887.34   76.56  0.30( 0.30) 0.99   21271.1   11530.00
      7    20792.69   84.85  0.30( 0.30) 0.99   25136.2   11900.00
      8    22344.19   94.73  0.30( 0.30) 0.99   30969.3   11330.00
      9    23226.14  103.02  0.30( 0.30) 0.99   36053.9   10630.00
     10    23150.77  108.60  0.30( 0.30) 0.99   38647.7   12330.00
     11    23055.36  115.19  0.30( 0.30) 0.99   41786.4   11600.00
     12    22812.83  120.92  0.30( 0.30) 0.99   44018.8   11111.00
     13    22529.71  127.01  0.30( 0.30) 0.99   45955.0   12201.00
     14    21810.70  135.83  0.30( 0.30) 0.99   48042.7   12231.00
     15    21137.94  143.21  0.30( 0.30) 0.99   49456.1   10400.00
     16    20725.84  147.11  0.30( 0.30) 0.99   50046.1   10200.00
     17    20051.76  154.43  0.30( 0.30) 0.99   51073.3   10320.00
     18    19475.54  159.22  0.30( 0.30) 0.99   51301.2   10210.00
     19    18984.60  163.97  0.30( 0.30) 0.99   51462.6   12000.00
     20    16385.20  192.66  0.30( 0.30) 0.99   52080.4   10100.00
    TOTAL AREA(ACRES) =    52080.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S28.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      980.25   27.73  0.30( 0.29) 0.98    1026.3   50120.00
      2      957.41   29.15  0.30( 0.29) 0.98    1042.7   50150.00
      3      896.35   32.55  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      980.25   27.73  0.30( 0.29) 0.98    1026.3   50120.00
      2      957.41   29.15  0.30( 0.29) 0.98    1042.7   50150.00
      3      896.35   32.55  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =      1063.4
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      980.25   27.73    1.325  0.30( 0.29) 0.98    1026.3   50120.00
      2      957.41   29.15    1.284  0.30( 0.29) 0.98    1042.7   50150.00
      3      896.35   32.55    1.213  0.30( 0.29) 0.98    1063.4   50100.00
  LONGEST FLOWPATH FROM NODE  50150.00 TO NODE  12800.00 =   11349.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    13653.25   25.38    1.393  0.30( 0.30) 0.99    4738.3   31300.00
      2    15230.39   33.74    1.191  0.30( 0.30) 0.99    6921.1   12710.00
      3    16451.69   42.00    1.054  0.30( 0.30) 0.99    9677.8   31400.00
      4    17692.80   52.04    0.942  0.30( 0.30) 0.99   13012.2   40100.00
      5    18559.24   62.78    0.858  0.30( 0.30) 0.99   16278.3   11801.00
      6    19887.34   76.56    0.791  0.30( 0.30) 0.99   21271.1   11530.00
      7    20792.69   84.85    0.750  0.30( 0.30) 0.99   25136.2   11900.00
      8    22344.19   94.73    0.712  0.30( 0.30) 0.99   30969.3   11330.00
      9    23226.14  103.02    0.689  0.30( 0.30) 0.99   36053.9   10630.00
     10    23150.77  108.60    0.674  0.30( 0.30) 0.99   38647.7   12330.00
     11    23055.36  115.19    0.655  0.30( 0.30) 0.99   41786.4   11600.00
     12    22812.83  120.92    0.640  0.30( 0.30) 0.99   44018.8   11111.00
     13    22529.71  127.01    0.630  0.30( 0.30) 0.99   45955.0   12201.00
     14    21810.70  135.83    0.615  0.30( 0.30) 0.99   48042.7   12231.00
     15    21137.94  143.21    0.602  0.30( 0.30) 0.99   49456.1   10400.00
     16    20725.84  147.11    0.595  0.30( 0.30) 0.99   50046.1   10200.00
     17    20051.76  154.43    0.583  0.30( 0.30) 0.99   51073.3   10320.00
     18    19475.54  159.22    0.575  0.30( 0.30) 0.99   51301.2   10210.00
     19    18984.60  163.97    0.567  0.30( 0.30) 0.99   51462.6   12000.00
     20    16385.20  192.66    0.529  0.30( 0.30) 0.99   52080.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    14609.77   25.38    1.393  0.30( 0.30) 0.99    5677.7   31300.00
      2    15076.59   27.73    1.325  0.30( 0.30) 0.99    6377.9   50120.00
      3    15321.93   29.15    1.284  0.30( 0.30) 0.99    6765.4   50150.00
      4    15902.68   32.55    1.213  0.30( 0.30) 0.99    7674.4   50100.00
      5    16105.77   33.74    1.191  0.30( 0.30) 0.99    7984.5   12710.00
      6    17193.44   42.00    1.054  0.30( 0.30) 0.99   10741.2   31400.00
      7    18324.86   52.04    0.942  0.30( 0.30) 0.99   14075.6   40100.00
      8    19109.62   62.78    0.858  0.30( 0.30) 0.99   17341.7   11801.00
      9    20371.82   76.56    0.791  0.30( 0.30) 0.99   22334.4   11530.00
     10    21237.56   84.85    0.750  0.30( 0.30) 0.99   26199.6   11900.00
     11    22751.64   94.73    0.712  0.30( 0.30) 0.99   32032.7   11330.00
     12    23611.19  103.02    0.689  0.30( 0.30) 0.99   37117.3   10630.00
     13    23520.77  108.60    0.674  0.30( 0.30) 0.99   39711.1   12330.00
     14    23407.57  115.19    0.655  0.30( 0.30) 0.99   42849.8   11600.00
     15    23150.51  120.92    0.640  0.30( 0.30) 0.99   45082.2   11111.00
```



```
     16    22857.18  127.01    0.630  0.30( 0.30) 0.99   47018.4   12201.00
     17    22123.40  135.83    0.615  0.30( 0.30) 0.99   49106.1   12231.00
     18    21438.26  143.21    0.602  0.30( 0.30) 0.99   50519.5   10400.00
     19    21019.63  147.11    0.595  0.30( 0.30) 0.99   51109.5   10200.00
     20    20333.29  154.43    0.583  0.30( 0.30) 0.99   52136.6   10320.00
     21    19749.04  159.22    0.575  0.30( 0.30) 0.99   52364.5   10210.00
     22    19250.15  163.97    0.567  0.30( 0.30) 0.99   52526.0   12000.00
     23    16614.27  192.66    0.529  0.30( 0.30) 0.99   53143.8   10100.00
   TOTAL AREA(ACRES) =     53143.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    23611.19  Tc(MIN.) =  103.024
  EFFECTIVE AREA(ACRES) =  37117.30  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53143.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12801.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.00  DOWNSTREAM(FEET) =    234.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.96   CHANNEL SLOPE =  0.0054
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.72
  CHANNEL FLOW THRU SUBAREA(CFS) =   23611.19
  FLOW VELOCITY(FEET/SEC.) =  12.82   FLOW DEPTH(FEET) =   7.72
  TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =  104.47
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    14609.77   27.08    1.344  0.30( 0.30) 0.99    5677.7   31300.00
      2    15076.59   29.41    1.276  0.30( 0.30) 0.99    6377.9   50120.00
      3    15321.93   30.82    1.244  0.30( 0.30) 0.99    6765.4   50150.00
      4    15902.68   34.20    1.183  0.30( 0.30) 0.99    7674.4   50100.00
      5    16105.77   35.38    1.162  0.30( 0.30) 0.99    7984.5   12710.00
      6    17193.44   43.61    1.035  0.30( 0.30) 0.99   10741.2   31400.00
      7    18324.86   53.61    0.928  0.30( 0.30) 0.99   14075.6   40100.00
      8    19109.62   64.34    0.851  0.30( 0.30) 0.99   17341.7   11801.00
      9    20371.82   78.08    0.783  0.30( 0.30) 0.99   22334.4   11530.00
     10    21237.56   86.34    0.743  0.30( 0.30) 0.99   26199.6   11900.00
     11    22751.64   96.19    0.708  0.30( 0.30) 0.99   32032.7   11330.00
     12    23611.19  104.47    0.685  0.30( 0.30) 0.99   37117.3   10630.00
     13    23520.77  110.05    0.670  0.30( 0.30) 0.99   39711.1   12330.00
     14    23407.57  116.64    0.651  0.30( 0.30) 0.99   42849.8   11600.00
     15    23150.51  122.37    0.638  0.30( 0.30) 0.99   45082.2   11111.00
     16    22857.18  128.47    0.627  0.30( 0.30) 0.99   47018.4   12201.00
     17    22123.40  137.30    0.612  0.30( 0.30) 0.99   49106.1   12231.00
     18    21438.26  144.71    0.600  0.30( 0.30) 0.99   50519.5   10400.00
     19    21019.63  148.61    0.593  0.30( 0.30) 0.99   51109.5   10200.00
     20    20333.29  155.95    0.580  0.30( 0.30) 0.99   52136.6   10320.00
     21    19749.04  160.75    0.572  0.30( 0.30) 0.99   52364.5   10210.00
     22    19250.15  165.52    0.564  0.30( 0.30) 0.99   52526.0   12000.00
```

```
    23    16614.27  194.29    0.528  0.30( 0.30) 0.99   53143.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   23611.19  Tc(MIN.) =  104.47
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   37117.30

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610502V.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       55.71   11.00  0.30( 0.28) 0.94      28.9   50200.00
    TOTAL AREA(ACRES) =       28.9

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14609.77   27.08    1.344  0.30( 0.30) 0.99    5677.7   31300.00
      2    15076.59   29.41    1.276  0.30( 0.30) 0.99    6377.9   50120.00
      3    15321.93   30.82    1.244  0.30( 0.30) 0.99    6765.4   50150.00
      4    15902.68   34.20    1.183  0.30( 0.30) 0.99    7674.4   50100.00
      5    16105.77   35.38    1.162  0.30( 0.30) 0.99    7984.5   12710.00
      6    17193.44   43.61    1.035  0.30( 0.30) 0.99   10741.2   31400.00
      7    18324.86   53.61    0.928  0.30( 0.30) 0.99   14075.6   40100.00
      8    19109.62   64.34    0.851  0.30( 0.30) 0.99   17341.7   11801.00
      9    20371.82   78.08    0.783  0.30( 0.30) 0.99   22334.4   11530.00
     10    21237.56   86.34    0.743  0.30( 0.30) 0.99   26199.6   11900.00
     11    22751.64   96.19    0.708  0.30( 0.30) 0.99   32032.7   11330.00
     12    23611.19  104.47    0.685  0.30( 0.30) 0.99   37117.3   10630.00
     13    23520.77  110.05    0.670  0.30( 0.30) 0.99   39711.1   12330.00
     14    23407.57  116.64    0.651  0.30( 0.30) 0.99   42849.8   11600.00
     15    23150.51  122.37    0.638  0.30( 0.30) 0.99   45082.2   11111.00
     16    22857.18  128.47    0.627  0.30( 0.30) 0.99   47018.4   12201.00
     17    22123.40  137.30    0.612  0.30( 0.30) 0.99   49106.1   12231.00
     18    21438.26  144.71    0.600  0.30( 0.30) 0.99   50519.5   10400.00
     19    21019.63  148.61    0.593  0.30( 0.30) 0.99   51109.5   10200.00
     20    20333.29  155.95    0.580  0.30( 0.30) 0.99   52136.6   10320.00
     21    19749.04  160.75    0.572  0.30( 0.30) 0.99   52364.5   10210.00
     22    19250.15  165.52    0.564  0.30( 0.30) 0.99   52526.0   12000.00
     23    16614.27  194.29    0.528  0.30( 0.30) 0.99   53143.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.
```



```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       55.71   11.00    2.426  0.30( 0.28) 0.94      28.9   50200.00
  LONGEST FLOWPATH FROM NODE  50200.00 TO NODE  12801.00 =    1426.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12127.91   11.00    2.426  0.30( 0.30) 0.99    2335.3   50200.00
      2    14637.37   27.08    1.344  0.30( 0.30) 0.99    5706.6   31300.00
      3    15102.44   29.41    1.276  0.30( 0.30) 0.99    6406.8   50120.00
      4    15346.94   30.82    1.244  0.30( 0.30) 0.99    6794.2   50150.00
      5    15926.10   34.20    1.183  0.30( 0.30) 0.99    7703.3   50100.00
      6    16128.64   35.38    1.162  0.30( 0.30) 0.99    8013.4   12710.00
      7    17213.04   43.61    1.035  0.30( 0.30) 0.99   10770.0   31400.00
      8    18341.67   53.61    0.928  0.30( 0.30) 0.99   14104.4   40100.00
      9    19124.42   64.34    0.851  0.30( 0.30) 0.99   17370.5   11801.00
     10    20384.88   78.08    0.783  0.30( 0.30) 0.99   22363.3   11530.00
     11    21249.56   86.34    0.743  0.30( 0.30) 0.99   26228.4   11900.00
     12    22762.73   96.19    0.708  0.30( 0.30) 0.99   32061.6   11330.00
     13    23621.69  104.47    0.685  0.30( 0.30) 0.99   37146.2   10630.00
     14    23530.87  110.05    0.670  0.30( 0.30) 0.99   39740.0   12330.00
     15    23417.19  116.64    0.651  0.30( 0.30) 0.99   42878.6   11600.00
     16    23159.79  122.37    0.638  0.30( 0.30) 0.99   45111.1   11111.00
     17    22866.18  128.47    0.627  0.30( 0.30) 0.99   47047.3   12201.00
     18    22132.01  137.30    0.612  0.30( 0.30) 0.99   49135.0   12231.00
     19    21446.53  144.71    0.600  0.30( 0.30) 0.99   50548.3   10400.00
     20    21027.74  148.61    0.593  0.30( 0.30) 0.99   51138.4   10200.00
     21    20341.06  155.95    0.580  0.30( 0.30) 0.99   52165.5   10320.00
     22    19756.60  160.75    0.572  0.30( 0.30) 0.99   52393.4   10210.00
     23    19257.50  165.52    0.564  0.30( 0.30) 0.99   52554.9   12000.00
     24    16620.68  194.29    0.528  0.30( 0.30) 0.99   53172.6   10100.00
    TOTAL AREA(ACRES) =     53172.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    23621.69  Tc(MIN.) =  104.468
  EFFECTIVE AREA(ACRES) =  37146.18  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53172.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12901.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    234.00  DOWNSTREAM(FEET) =    216.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2009.32   CHANNEL SLOPE =  0.0090
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.68
  CHANNEL FLOW THRU SUBAREA(CFS) =   23621.69
  FLOW VELOCITY(FEET/SEC.) =  15.15   FLOW DEPTH(FEET) =   6.68
  TRAVEL TIME(MIN.) =   2.21   Tc(MIN.) =  106.68
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM        Q       Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1    12127.91   13.79     2.046  0.30( 0.30) 0.99    2335.3   50200.00
     2    14637.37   29.69     1.268  0.30( 0.30) 0.99    5706.6   31300.00
     3    15102.44   31.99     1.223  0.30( 0.30) 0.99    6406.8   50120.00
     4    15346.94   33.39     1.198  0.30( 0.30) 0.99    6794.2   50150.00
     5    15926.10   36.74     1.137  0.30( 0.30) 0.99    7703.3   50100.00
     6    16128.64   37.90     1.116  0.30( 0.30) 0.99    8013.4   12710.00
     7    17213.04   46.07     1.006  0.30( 0.30) 0.99   10770.0   31400.00
     8    18341.67   56.03     0.907  0.30( 0.30) 0.99   14104.4   40100.00
     9    19124.42   66.71     0.839  0.30( 0.30) 0.99   17370.5   11801.00
    10    20384.88   80.40     0.772  0.30( 0.30) 0.99   22363.3   11530.00
    11    21249.56   88.63     0.732  0.30( 0.30) 0.99   26228.4   11900.00
    12    22762.73   98.43     0.702  0.30( 0.30) 0.99   32061.6   11330.00
    13    23621.69  106.68     0.679  0.30( 0.30) 0.99   37146.2   10630.00
    14    23530.87  112.26     0.663  0.30( 0.30) 0.99   39740.0   12330.00
    15    23417.19  118.85     0.645  0.30( 0.30) 0.99   42878.6   11600.00
    16    23159.79  124.60     0.634  0.30( 0.30) 0.99   45111.1   11111.00
    17    22866.18  130.70     0.624  0.30( 0.30) 0.99   47047.3   12201.00
    18    22132.01  139.56     0.608  0.30( 0.30) 0.99   49135.0   12231.00
    19    21446.53  146.99     0.596  0.30( 0.30) 0.99   50548.3   10400.00
    20    21027.74  150.91     0.589  0.30( 0.30) 0.99   51138.4   10200.00
    21    20341.06  158.27     0.576  0.30( 0.30) 0.99   52165.5   10320.00
    22    19756.60  163.10     0.568  0.30( 0.30) 0.99   52393.4   10210.00
    23    19257.50  167.89     0.560  0.30( 0.30) 0.99   52554.9   12000.00
    24    16620.68  196.79     0.526  0.30( 0.30) 0.99   53172.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   23621.69  Tc(MIN.) =  106.68
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   37146.18

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610312V.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM        Q       Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1       320.72   32.68  0.30( 0.29) 0.96      385.8   31200.00
    TOTAL AREA(ACRES) =      385.8

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q       Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1    12127.91   13.79     2.046  0.30( 0.30) 0.99    2335.3   50200.00
      2    14637.37   29.69     1.268  0.30( 0.30) 0.99    5706.6   31300.00
      3    15102.44   31.99     1.223  0.30( 0.30) 0.99    6406.8   50120.00
      4    15346.94   33.39     1.198  0.30( 0.30) 0.99    6794.2   50150.00
      5    15926.10   36.74     1.137  0.30( 0.30) 0.99    7703.3   50100.00
```



```
      6    16128.64   37.90     1.116  0.30( 0.30) 0.99    8013.4   12710.00
      7    17213.04   46.07     1.006  0.30( 0.30) 0.99   10770.0   31400.00
      8    18341.67   56.03     0.907  0.30( 0.30) 0.99   14104.4   40100.00
      9    19124.42   66.71     0.839  0.30( 0.30) 0.99   17370.5   11801.00
     10    20384.88   80.40     0.772  0.30( 0.30) 0.99   22363.3   11530.00
     11    21249.56   88.63     0.732  0.30( 0.30) 0.99   26228.4   11900.00
     12    22762.73   98.43     0.702  0.30( 0.30) 0.99   32061.6   11330.00
     13    23621.69  106.68     0.679  0.30( 0.30) 0.99   37146.2   10630.00
     14    23530.87  112.26     0.663  0.30( 0.30) 0.99   39740.0   12330.00
     15    23417.19  118.85     0.645  0.30( 0.30) 0.99   42878.6   11600.00
     16    23159.79  124.60     0.634  0.30( 0.30) 0.99   45111.1   11111.00
     17    22866.18  130.70     0.624  0.30( 0.30) 0.99   47047.3   12201.00
     18    22132.01  139.56     0.608  0.30( 0.30) 0.99   49135.0   12231.00
     19    21446.53  146.99     0.596  0.30( 0.30) 0.99   50548.3   10400.00
     20    21027.74  150.91     0.589  0.30( 0.30) 0.99   51138.4   10200.00
     21    20341.06  158.27     0.576  0.30( 0.30) 0.99   52165.5   10320.00
     22    19756.60  163.10     0.568  0.30( 0.30) 0.99   52393.4   10210.00
     23    19257.50  167.89     0.560  0.30( 0.30) 0.99   52554.9   12000.00
     24    16620.68  196.79     0.526  0.30( 0.30) 0.99   53172.6   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM        Q       Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1       320.72   32.68     1.211  0.30( 0.29) 0.96      385.8   31200.00
 LONGEST FLOWPATH FROM NODE  31200.00 TO NODE  12901.00 =   11169.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q       Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1    12385.62   13.79     2.046  0.30( 0.30) 0.99    2498.1   50200.00
     2    14946.89   29.69     1.268  0.30( 0.30) 0.99    6057.1   31300.00
     3    15420.64   31.99     1.223  0.30( 0.30) 0.99    6784.4   50120.00
     4    15543.20   32.68     1.211  0.30( 0.30) 0.99    6982.8   31200.00
     5    15663.20   33.39     1.198  0.30( 0.30) 0.99    7180.0   50150.00
     6    16221.32   36.74     1.137  0.30( 0.30) 0.99    8089.0   50100.00
     7    16416.52   37.90     1.116  0.30( 0.30) 0.99    8399.2   12710.00
     8    17462.89   46.07     1.006  0.30( 0.30) 0.99   11155.8   31400.00
     9    18557.03   56.03     0.907  0.30( 0.30) 0.99   14490.2   40100.00
    10    19316.22   66.71     0.839  0.30( 0.30) 0.99   17756.3   11801.00
    11    20553.39   80.40     0.772  0.30( 0.30) 0.99   22749.1   11530.00
    12    21404.07   88.63     0.732  0.30( 0.30) 0.99   26614.2   11900.00
    13    22906.83   98.43     0.702  0.30( 0.30) 0.99   32447.4   11330.00
    14    23757.87  106.68     0.679  0.30( 0.30) 0.99   37531.9   10630.00
    15    23661.69  112.26     0.663  0.30( 0.30) 0.99   40125.8   12330.00
    16    23541.68  118.85     0.645  0.30( 0.30) 0.99   43264.4   11600.00
    17    23280.44  124.60     0.634  0.30( 0.30) 0.99   45496.8   11111.00
    18    22983.19  130.70     0.624  0.30( 0.30) 0.99   47433.1   12201.00
    19    22243.74  139.56     0.608  0.30( 0.30) 0.99   49520.8   12231.00
    20    21553.84  146.99     0.596  0.30( 0.30) 0.99   50934.1   10400.00
    21    21132.71  150.91     0.589  0.30( 0.30) 0.99   51524.2   10200.00
    22    20441.65  158.27     0.576  0.30( 0.30) 0.99   52551.3   10320.00
    23    19854.30  163.10     0.568  0.30( 0.30) 0.99   52779.2   10210.00
    24    19352.35  167.89     0.560  0.30( 0.30) 0.99   52940.6   12000.00
    25    16703.79  196.79     0.526  0.30( 0.30) 0.99   53558.4   10100.00
  TOTAL AREA(ACRES) =     53558.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
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PEAK FLOW RATE(CFS) = 23757.87 Tc(MIN.) = 106.678
EFFECTIVE AREA(ACRES) = 37531.95 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53558.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: 0610503V.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	362.58	25.19	0.30(0.30)	0.99	366.1	50300.00

TOTAL AREA(ACRES) = 366.1

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12385.62	13.79	2.046	0.30(0.30)	0.99	2498.1	50200.00
2	14946.89	29.69	1.268	0.30(0.30)	0.99	6057.1	31300.00
3	15420.64	31.99	1.223	0.30(0.30)	0.99	6784.4	50120.00
4	15543.20	32.68	1.211	0.30(0.30)	0.99	6982.8	31200.00
5	15663.20	33.39	1.198	0.30(0.30)	0.99	7180.0	50150.00
6	16221.32	36.74	1.137	0.30(0.30)	0.99	8089.0	50100.00
7	16416.52	37.90	1.116	0.30(0.30)	0.99	8399.2	12710.00
8	17462.89	46.07	1.006	0.30(0.30)	0.99	11155.8	31400.00
9	18557.03	56.03	0.907	0.30(0.30)	0.99	14490.2	40100.00
10	19316.22	66.71	0.839	0.30(0.30)	0.99	17756.3	11801.00
11	20553.39	80.40	0.772	0.30(0.30)	0.99	22749.1	11530.00
12	21404.07	88.63	0.732	0.30(0.30)	0.99	26614.2	11900.00
13	22906.83	98.43	0.702	0.30(0.30)	0.99	32447.4	11330.00
14	23757.87	106.68	0.679	0.30(0.30)	0.99	37531.9	10630.00
15	23661.69	112.26	0.663	0.30(0.30)	0.99	40125.8	12330.00
16	23541.68	118.85	0.645	0.30(0.30)	0.99	43264.4	11600.00
17	23280.44	124.60	0.634	0.30(0.30)	0.99	45496.8	11111.00
18	22983.19	130.70	0.624	0.30(0.30)	0.99	47433.1	12201.00
19	22243.74	139.56	0.608	0.30(0.30)	0.99	49520.8	12231.00
20	21553.84	146.99	0.596	0.30(0.30)	0.99	50934.1	10400.00
21	21132.71	150.91	0.589	0.30(0.30)	0.99	51524.2	10200.00
22	20441.65	158.27	0.576	0.30(0.30)	0.99	52551.3	10320.00
23	19854.30	163.10	0.568	0.30(0.30)	0.99	52779.2	10210.00
24	19352.35	167.89	0.560	0.30(0.30)	0.99	52940.6	12000.00
25	16703.79	196.79	0.526	0.30(0.30)	0.99	53558.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	362.58	25.19	1.399	0.30(0.30)	0.99	366.1	50300.00

LONGEST FLOWPATH FROM NODE 50300.00 TO NODE 12901.00 = 8614.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12700.87	13.79	2.046	0.30(0.30)	0.99	2698.6	50200.00
2	14584.03	25.19	1.399	0.30(0.30)	0.99	5415.2	50300.00
3	15266.45	29.69	1.268	0.30(0.30)	0.99	6423.2	31300.00
4	15725.38	31.99	1.223	0.30(0.30)	0.99	7150.6	50120.00
5	15843.86	32.68	1.211	0.30(0.30)	0.99	7348.9	31200.00
6	15959.62	33.39	1.198	0.30(0.30)	0.99	7546.1	50150.00
7	16497.78	36.74	1.137	0.30(0.30)	0.99	8455.2	50100.00
8	16686.03	37.90	1.116	0.30(0.30)	0.99	8765.3	12710.00
9	17696.31	46.07	1.006	0.30(0.30)	0.99	11521.9	31400.00
10	18757.72	56.03	0.907	0.30(0.30)	0.99	14856.3	40100.00
11	19494.56	66.71	0.839	0.30(0.30)	0.99	18122.4	11801.00
12	20709.63	80.40	0.772	0.30(0.30)	0.99	23115.2	11530.00
13	21547.04	88.63	0.732	0.30(0.30)	0.99	26980.3	11900.00
14	23039.91	98.43	0.702	0.30(0.30)	0.99	32813.5	11330.00
15	23883.43	106.68	0.679	0.30(0.30)	0.99	37898.1	10630.00
16	23782.17	112.26	0.663	0.30(0.30)	0.99	40491.9	12330.00
17	23656.15	118.85	0.645	0.30(0.30)	0.99	43630.5	11600.00
18	23391.27	124.60	0.634	0.30(0.30)	0.99	45862.9	11111.00
19	23090.57	130.70	0.624	0.30(0.30)	0.99	47799.2	12201.00
20	22346.11	139.56	0.608	0.30(0.30)	0.99	49886.9	12231.00
21	21652.01	146.99	0.596	0.30(0.30)	0.99	51300.2	10400.00
22	21228.66	150.91	0.589	0.30(0.30)	0.99	51890.3	10200.00
23	20533.44	158.27	0.576	0.30(0.30)	0.99	52917.4	10320.00
24	19943.37	163.10	0.568	0.30(0.30)	0.99	53145.3	10210.00
25	19438.71	167.89	0.560	0.30(0.30)	0.99	53306.8	12000.00
26	16779.00	196.79	0.526	0.30(0.30)	0.99	53924.5	10100.00

TOTAL AREA(ACRES) = 53924.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 23883.43 Tc(MIN.) = 106.678
EFFECTIVE AREA(ACRES) = 37898.07 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53924.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12902.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 216.00 DOWNSTREAM(FEET) = 215.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 122.04 CHANNEL SLOPE = 0.0082
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.89
CHANNEL FLOW THRU SUBAREA(CFS) = 23883.43

FLOW VELOCITY(FEET/SEC.) = 14.78 FLOW DEPTH(FEET) = 6.89
TRAVEL TIME(MIN.) = 0.14 Tc(MIN.) = 106.82
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12902.00 = 115038.03 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12700.87	13.96	2.023	0.30(0.30)	0.99	2698.6	50200.00
2	14584.03	25.35	1.394	0.30(0.30)	0.99	5415.2	50300.00
3	15266.45	29.85	1.263	0.30(0.30)	0.99	6423.2	31300.00
4	15725.38	32.15	1.220	0.30(0.30)	0.99	7150.6	50120.00
5	15843.86	32.84	1.208	0.30(0.30)	0.99	7348.9	31200.00
6	15959.62	33.55	1.195	0.30(0.30)	0.99	7546.1	50150.00
7	16497.78	36.89	1.134	0.30(0.30)	0.99	8455.2	50100.00
8	16686.03	38.06	1.113	0.30(0.30)	0.99	8765.3	12710.00
9	17696.31	46.22	1.005	0.30(0.30)	0.99	11521.9	31400.00
10	18757.72	56.18	0.906	0.30(0.30)	0.99	14856.3	40100.00
11	19494.56	66.86	0.838	0.30(0.30)	0.99	18122.4	11801.00
12	20709.63	80.55	0.771	0.30(0.30)	0.99	23115.2	11530.00
13	21547.04	88.78	0.731	0.30(0.30)	0.99	26980.3	11900.00
14	23039.91	98.57	0.701	0.30(0.30)	0.99	32813.5	11330.00
15	23883.43	106.82	0.678	0.30(0.30)	0.99	37898.1	10630.00
16	23782.17	112.40	0.663	0.30(0.30)	0.99	40491.9	12330.00
17	23656.15	118.99	0.645	0.30(0.30)	0.99	43630.5	11600.00
18	23391.27	124.73	0.634	0.30(0.30)	0.99	45862.9	11111.00
19	23090.57	130.84	0.623	0.30(0.30)	0.99	47799.2	12201.00
20	22346.11	139.70	0.608	0.30(0.30)	0.99	49886.9	12231.00
21	21652.01	147.13	0.595	0.30(0.30)	0.99	51300.2	10400.00
22	21228.66	151.05	0.589	0.30(0.30)	0.99	51890.3	10200.00
23	20533.44	158.42	0.576	0.30(0.30)	0.99	52917.4	10320.00
24	19943.37	163.25	0.568	0.30(0.30)	0.99	53145.3	10210.00
25	19438.71	168.03	0.560	0.30(0.30)	0.99	53306.8	12000.00
26	16779.00	196.94	0.526	0.30(0.30)	0.99	53924.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 23883.43 Tc(MIN.) = 106.82
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37898.07

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12902.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 215.00 DOWNSTREAM(FEET) = 214.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 895.53 CHANNEL SLOPE = 0.0011
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.12
CHANNEL FLOW THRU SUBAREA(CFS) = 23883.43
FLOW VELOCITY(FEET/SEC.) = 7.56 FLOW DEPTH(FEET) = 12.12
TRAVEL TIME(MIN.) = 1.97 Tc(MIN.) = 108.79

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12700.87	16.38	1.806	0.30(0.30)	0.99	2698.6	50200.00
2	14584.03	27.66	1.327	0.30(0.30)	0.99	5415.2	50300.00
3	15266.45	32.13	1.220	0.30(0.30)	0.99	6423.2	31300.00
4	15725.38	34.41	1.179	0.30(0.30)	0.99	7150.6	50120.00
5	15843.86	35.09	1.167	0.30(0.30)	0.99	7348.9	31200.00
6	15959.62	35.79	1.154	0.30(0.30)	0.99	7546.1	50150.00
7	16497.78	39.12	1.094	0.30(0.30)	0.99	8455.2	50100.00
8	16686.03	40.27	1.075	0.30(0.30)	0.99	8765.3	12710.00
9	17696.31	48.40	0.979	0.30(0.30)	0.99	11521.9	31400.00
10	18757.72	58.31	0.887	0.30(0.30)	0.99	14856.3	40100.00
11	19494.56	68.97	0.828	0.30(0.30)	0.99	18122.4	11801.00
12	20709.63	82.61	0.761	0.30(0.30)	0.99	23115.2	11530.00
13	21547.04	90.82	0.723	0.30(0.30)	0.99	26980.3	11900.00
14	23039.91	100.57	0.696	0.30(0.30)	0.99	32813.5	11330.00
15	23883.43	108.79	0.673	0.30(0.30)	0.99	37898.1	10630.00
16	23782.17	114.37	0.658	0.30(0.30)	0.99	40491.9	12330.00
17	23656.15	120.97	0.640	0.30(0.30)	0.99	43630.5	11600.00
18	23391.27	126.72	0.630	0.30(0.30)	0.99	45862.9	11111.00
19	23090.57	132.84	0.620	0.30(0.30)	0.99	47799.2	12201.00
20	22346.11	141.72	0.605	0.30(0.30)	0.99	49886.9	12231.00
21	21652.01	149.17	0.592	0.30(0.30)	0.99	51300.2	10400.00
22	21228.66	153.10	0.585	0.30(0.30)	0.99	51890.3	10200.00
23	20533.44	160.49	0.572	0.30(0.30)	0.99	52917.4	10320.00
24	19943.37	165.34	0.564	0.30(0.30)	0.99	53145.3	10210.00
25	19438.71	170.14	0.556	0.30(0.30)	0.99	53306.8	12000.00
26	16779.00	199.15	0.524	0.30(0.30)	0.99	53924.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 23883.43 Tc(MIN.) = 108.79
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37898.07

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
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****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610504V.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	93.58	17.16	0.30(0.29)	0.97	70.7	50400.00

TOTAL AREA(ACRES) = 70.7

****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12700.87	16.38	1.806	0.30(0.30)	0.99	2698.6	50200.00
2	14584.03	27.66	1.327	0.30(0.30)	0.99	5415.2	50300.00
3	15266.45	32.13	1.220	0.30(0.30)	0.99	6423.2	31300.00
4	15725.38	34.41	1.179	0.30(0.30)	0.99	7150.6	50120.00
5	15843.86	35.09	1.167	0.30(0.30)	0.99	7348.9	31200.00
6	15959.62	35.79	1.154	0.30(0.30)	0.99	7546.1	50150.00
7	16497.78	39.12	1.094	0.30(0.30)	0.99	8455.2	50100.00
8	16686.03	40.27	1.075	0.30(0.30)	0.99	8765.3	12710.00
9	17696.31	48.40	0.979	0.30(0.30)	0.99	11521.9	31400.00
10	18757.72	58.31	0.887	0.30(0.30)	0.99	14856.3	40100.00
11	19494.56	68.97	0.828	0.30(0.30)	0.99	18122.4	11801.00
12	20709.63	82.61	0.761	0.30(0.30)	0.99	23115.2	11530.00
13	21547.04	90.82	0.723	0.30(0.30)	0.99	26980.3	11900.00
14	23039.91	100.57	0.696	0.30(0.30)	0.99	32813.5	11330.00
15	23883.43	108.79	0.673	0.30(0.30)	0.99	37898.1	10630.00
16	23782.17	114.37	0.658	0.30(0.30)	0.99	40491.9	12330.00
17	23656.15	120.97	0.640	0.30(0.30)	0.99	43630.5	11600.00
18	23391.27	126.72	0.630	0.30(0.30)	0.99	45862.9	11111.00
19	23090.57	132.84	0.620	0.30(0.30)	0.99	47799.2	12201.00
20	22346.11	141.72	0.605	0.30(0.30)	0.99	49886.9	12231.00
21	21652.01	149.17	0.592	0.30(0.30)	0.99	51300.2	10400.00
22	21228.66	153.10	0.585	0.30(0.30)	0.99	51890.3	10200.00
23	20533.44	160.49	0.572	0.30(0.30)	0.99	52917.4	10320.00
24	19943.37	165.34	0.564	0.30(0.30)	0.99	53145.3	10210.00
25	19438.71	170.14	0.556	0.30(0.30)	0.99	53306.8	12000.00
26	16779.00	199.15	0.524	0.30(0.30)	0.99	53924.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	93.58	17.16	1.764	0.30(0.29)	0.97	70.7	50400.00

LONGEST FLOWPATH FROM NODE 50400.00 TO NODE 12903.00 = 3607.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12792.76	16.38	1.806	0.30(0.30)	0.99	2766.0	50200.00
2	12924.89	17.16	1.764	0.30(0.30)	0.99	2957.4	50400.00
3	14649.82	27.66	1.327	0.30(0.30)	0.99	5485.9	50300.00
4	15325.48	32.13	1.220	0.30(0.30)	0.99	6493.9	31300.00
5	15781.79	34.41	1.179	0.30(0.30)	0.99	7221.2	50120.00
6	15899.48	35.09	1.167	0.30(0.30)	0.99	7419.6	31200.00
7	16014.43	35.79	1.154	0.30(0.30)	0.99	7616.8	50150.00
8	16548.77	39.12	1.094	0.30(0.30)	0.99	8525.8	50100.00
9	16735.79	40.27	1.075	0.30(0.30)	0.99	8836.0	12710.00
10	17739.98	48.40	0.979	0.30(0.30)	0.99	11592.6	31400.00
11	18795.53	58.31	0.887	0.30(0.30)	0.99	14927.0	40100.00
12	19528.64	68.97	0.828	0.30(0.30)	0.99	18193.1	11801.00
13	20739.46	82.61	0.761	0.30(0.30)	0.99	23185.9	11530.00
14	21574.41	90.82	0.723	0.30(0.30)	0.99	27051.0	11900.00
15	23065.57	100.57	0.696	0.30(0.30)	0.99	32884.2	11330.00
16	23907.65	108.79	0.673	0.30(0.30)	0.99	37968.7	10630.00

17	23805.40	114.37	0.658	0.30(0.30)	0.99	40562.6	12330.00
18	23678.29	120.97	0.640	0.30(0.30)	0.99	43701.2	11600.00
19	23412.77	126.72	0.630	0.30(0.30)	0.99	45933.6	11111.00
20	23111.41	132.84	0.620	0.30(0.30)	0.99	47869.9	12201.00
21	22365.98	141.72	0.605	0.30(0.30)	0.99	49957.6	12231.00
22	21671.06	149.17	0.592	0.30(0.30)	0.99	51370.9	10400.00
23	21247.29	153.10	0.585	0.30(0.30)	0.99	51961.0	10200.00
24	20551.26	160.49	0.572	0.30(0.30)	0.99	52988.1	10320.00
25	19960.66	165.34	0.564	0.30(0.30)	0.99	53216.0	10210.00
26	19455.48	170.14	0.556	0.30(0.30)	0.99	53377.4	12000.00
27	16793.74	199.15	0.524	0.30(0.30)	0.99	53995.2	10100.00

TOTAL AREA(ACRES) = 53995.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 23907.65 Tc(MIN.) = 108.790
EFFECTIVE AREA(ACRES) = 37968.75 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53995.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

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FLOW PROCESS FROM NODE 12903.00 TO NODE 12904.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 214.00 DOWNSTREAM(FEET) = 213.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 767.57 CHANNEL SLOPE = 0.0013
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.62
CHANNEL FLOW THRU SUBAREA(CFS) = 23907.65
FLOW VELOCITY(FEET/SEC.) = 7.97 FLOW DEPTH(FEET) = 11.62
TRAVEL TIME(MIN.) = 1.60 Tc(MIN.) = 110.39
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12792.76	18.35	1.699	0.30(0.30)	0.99	2766.0	50200.00
2	12924.89	19.12	1.658	0.30(0.30)	0.99	2957.4	50400.00
3	14649.82	29.54	1.272	0.30(0.30)	0.99	5485.9	50300.00
4	15325.48	33.98	1.187	0.30(0.30)	0.99	6493.9	31300.00
5	15781.79	36.24	1.146	0.30(0.30)	0.99	7221.2	50120.00
6	15899.48	36.92	1.134	0.30(0.30)	0.99	7419.6	31200.00
7	16014.43	37.62	1.121	0.30(0.30)	0.99	7616.8	50150.00
8	16548.77	40.92	1.067	0.30(0.30)	0.99	8525.8	50100.00
9	16735.79	42.07	1.054	0.30(0.30)	0.99	8836.0	12710.00
10	17739.98	50.16	0.959	0.30(0.30)	0.99	11592.6	31400.00
11	18795.53	60.04	0.872	0.30(0.30)	0.99	14927.0	40100.00
12	19528.64	70.68	0.820	0.30(0.30)	0.99	18193.1	11801.00
13	20739.46	84.29	0.753	0.30(0.30)	0.99	23185.9	11530.00
14	21574.41	92.47	0.718	0.30(0.30)	0.99	27051.0	11900.00
15	23065.57	102.19	0.691	0.30(0.30)	0.99	32884.2	11330.00
16	23907.65	110.39	0.669	0.30(0.30)	0.99	37968.7	10630.00
17	23805.40	115.98	0.653	0.30(0.30)	0.99	40562.6	12330.00
18	23678.29	122.58	0.638	0.30(0.30)	0.99	43701.2	11600.00
19	23412.77	128.34	0.628	0.30(0.30)	0.99	45933.6	11111.00

20	23111.41	134.46	0.617	0.30(0.30)	0.99	47869.9	12201.00
21	22365.98	143.36	0.602	0.30(0.30)	0.99	49957.6	12231.00
22	21671.06	150.82	0.589	0.30(0.30)	0.99	51370.9	10400.00
23	21247.29	154.77	0.582	0.30(0.30)	0.99	51961.0	10200.00
24	20551.26	162.17	0.570	0.30(0.30)	0.99	52988.1	10320.00
25	19960.66	167.04	0.561	0.30(0.30)	0.99	53216.0	10210.00
26	19455.48	171.85	0.553	0.30(0.30)	0.99	53377.4	12000.00
27	16793.74	200.95	0.523	0.30(0.30)	0.99	53995.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 23907.65 Tc(MIN.) = 110.39
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37968.75

****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
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****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610311V.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	101.82	29.42	0.30(0.29)	0.97	114.8	31100.00

TOTAL AREA(ACRES) = 114.8

****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12792.76	18.35	1.699	0.30(0.30)	0.99	2766.0	50200.00
2	12924.89	19.12	1.658	0.30(0.30)	0.99	2957.4	50400.00
3	14649.82	29.54	1.272	0.30(0.30)	0.99	5485.9	50300.00
4	15325.48	33.98	1.187	0.30(0.30)	0.99	6493.9	31300.00
5	15781.79	36.24	1.146	0.30(0.30)	0.99	7221.2	50120.00
6	15899.48	36.92	1.134	0.30(0.30)	0.99	7419.6	31200.00
7	16014.43	37.62	1.121	0.30(0.30)	0.99	7616.8	50150.00
8	16548.77	40.92	1.067	0.30(0.30)	0.99	8525.8	50100.00
9	16735.79	42.07	1.054	0.30(0.30)	0.99	8836.0	12710.00
10	17739.98	50.16	0.959	0.30(0.30)	0.99	11592.6	31400.00
11	18795.53	60.04	0.872	0.30(0.30)	0.99	14927.0	40100.00
12	19528.64	70.68	0.820	0.30(0.30)	0.99	18193.1	11801.00
13	20739.46	84.29	0.753	0.30(0.30)	0.99	23185.9	11530.00
14	21574.41	92.47	0.718	0.30(0.30)	0.99	27051.0	11900.00
15	23065.57	102.19	0.691	0.30(0.30)	0.99	32884.2	11330.00
16	23907.65	110.39	0.669	0.30(0.30)	0.99	37968.7	10630.00
17	23805.40	115.98	0.653	0.30(0.30)	0.99	40562.6	12330.00
18	23678.29	122.58	0.638	0.30(0.30)	0.99	43701.2	11600.00

19	23412.77	128.34	0.628	0.30(0.30)	0.99	45933.6	11111.00
20	23111.41	134.46	0.617	0.30(0.30)	0.99	47869.9	12201.00
21	22365.98	143.36	0.602	0.30(0.30)	0.99	49957.6	12231.00
22	21671.06	150.82	0.589	0.30(0.30)	0.99	51370.9	10400.00
23	21247.29	154.77	0.582	0.30(0.30)	0.99	51961.0	10200.00
24	20551.26	162.17	0.570	0.30(0.30)	0.99	52988.1	10320.00
25	19960.66	167.04	0.561	0.30(0.30)	0.99	53216.0	10210.00
26	19455.48	171.85	0.553	0.30(0.30)	0.99	53377.4	12000.00
27	16793.74	200.95	0.523	0.30(0.30)	0.99	53995.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	101.82	29.42	1.276	0.30(0.29)	0.97	114.8	31100.00

LONGEST FLOWPATH FROM NODE 31100.00 TO NODE 12904.00 = 6503.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12883.56	18.35	1.699	0.30(0.30)	0.99	2837.6	50200.00
2	13016.70	19.12	1.658	0.30(0.30)	0.99	3032.0	50400.00
3	14730.69	29.42	1.276	0.30(0.30)	0.99	5570.0	31100.00
4	14751.25	29.54	1.272	0.30(0.30)	0.99	5600.7	50300.00
5	15418.10	33.98	1.187	0.30(0.30)	0.99	6608.7	31300.00
6	15870.19	36.24	1.146	0.30(0.30)	0.99	7336.0	50120.00
7	15986.62	36.92	1.134	0.30(0.30)	0.99	7534.4	31200.00
8	16100.25	37.62	1.121	0.30(0.30)	0.99	7731.6	50150.00
9	16629.01	40.92	1.067	0.30(0.30)	0.99	8640.7	50100.00
10	16814.63	42.07	1.054	0.30(0.30)	0.99	8950.8	12710.00
11	17809.02	50.16	0.959	0.30(0.30)	0.99	11707.4	31400.00
12	18855.60	60.04	0.872	0.30(0.30)	0.99	15041.8	40100.00
13	19583.33	70.68	0.820	0.30(0.30)	0.99	18307.9	11801.00
14	20787.25	84.29	0.753	0.30(0.30)	0.99	23300.7	11530.00
15	21618.61	92.47	0.718	0.30(0.30)	0.99	27165.8	11900.00
16	23106.99	102.19	0.691	0.30(0.30)	0.99	32999.0	11330.00
17	23946.72	110.39	0.669	0.30(0.30)	0.99	38083.6	10630.00
18	23842.88	115.98	0.653	0.30(0.30)	0.99	40677.4	12330.00
19	23714.16	122.58	0.638	0.30(0.30)	0.99	43816.0	11600.00
20	23447.63	128.34	0.628	0.30(0.30)	0.99	46048.4	11111.00
21	23145.17	134.46	0.617	0.30(0.30)	0.99	47984.7	12201.00
22	22398.17	143.36	0.602	0.30(0.30)	0.99	50072.4	12231.00
23	21701.93	150.82	0.589	0.30(0.30)	0.99	51485.7	10400.00
24	21277.45	154.77	0.582	0.30(0.30)	0.99	52075.8	10200.00
25	20580.12	162.17	0.570	0.30(0.30)	0.99	53102.9	10320.00
26	19988.65	167.04	0.561	0.30(0.30)	0.99	53330.8	10210.00
27	19482.62	171.85	0.553	0.30(0.30)	0.99	53492.2	12000.00
28	16817.75	200.95	0.523	0.30(0.30)	0.99	54110.0	10100.00

TOTAL AREA(ACRES) = 54110.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 23946.72 Tc(MIN.) = 110.394
EFFECTIVE AREA(ACRES) = 38083.56 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 54110.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.
==========
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 54110.0 TC(MIN.) = 110.39
EFFECTIVE AREA(ACRES) = 38083.56 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.993
PEAK FLOW RATE(CFS) = 23946.72

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12883.56	18.35	1.699	0.30(0.30)	0.99	2837.6	50200.00
2	13016.70	19.12	1.658	0.30(0.30)	0.99	3032.0	50400.00
3	14730.69	29.42	1.276	0.30(0.30)	0.99	5570.0	31100.00
4	14751.25	29.54	1.272	0.30(0.30)	0.99	5600.7	50300.00
5	15418.10	33.98	1.187	0.30(0.30)	0.99	6608.7	31300.00
6	15870.19	36.24	1.146	0.30(0.30)	0.99	7336.0	50120.00
7	15986.62	36.92	1.134	0.30(0.30)	0.99	7534.4	31200.00
8	16100.25	37.62	1.121	0.30(0.30)	0.99	7731.6	50150.00
9	16629.01	40.92	1.067	0.30(0.30)	0.99	8640.7	50100.00
10	16814.63	42.07	1.054	0.30(0.30)	0.99	8950.8	12710.00
11	17809.02	50.16	0.959	0.30(0.30)	0.99	11707.4	31400.00
12	18855.60	60.04	0.872	0.30(0.30)	0.99	15041.8	40100.00
13	19583.33	70.68	0.820	0.30(0.30)	0.99	18307.9	11801.00
14	20787.25	84.29	0.753	0.30(0.30)	0.99	23300.7	11530.00
15	21618.61	92.47	0.718	0.30(0.30)	0.99	27165.8	11900.00
16	23106.99	102.19	0.691	0.30(0.30)	0.99	32999.0	11330.00
17	23946.72	110.39	0.669	0.30(0.30)	0.99	38083.6	10630.00
18	23842.88	115.98	0.653	0.30(0.30)	0.99	40677.4	12330.00
19	23714.16	122.58	0.638	0.30(0.30)	0.99	43816.0	11600.00
20	23447.63	128.34	0.628	0.30(0.30)	0.99	46048.4	11111.00
21	23145.17	134.46	0.617	0.30(0.30)	0.99	47984.7	12201.00
22	22398.17	143.36	0.602	0.30(0.30)	0.99	50072.4	12231.00
23	21701.93	150.82	0.589	0.30(0.30)	0.99	51485.7	10400.00
24	21277.45	154.77	0.582	0.30(0.30)	0.99	52075.8	10200.00
25	20580.12	162.17	0.570	0.30(0.30)	0.99	53102.9	10320.00
26	19988.65	167.04	0.561	0.30(0.30)	0.99	53330.8	10210.00
27	19482.62	171.85	0.553	0.30(0.30)	0.99	53492.2	12000.00
28	16817.75	200.95	0.523	0.30(0.30)	0.99	54110.0	10100.00

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S30.DAT
  TIME/DATE OF STUDY: 13:51 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.120
   2)   10.00;  2.158
   3)   15.00;  1.718
   4)   20.00;  1.461
   5)   25.00;  1.289
   6)   30.00;  1.180
   7)   40.00;  0.990
   8)   50.00;  0.873
   9)   60.00;  0.780
  10)   90.00;  0.628
  11)  120.00;  0.534
  12)  180.00;  0.437
  13)  360.00;  0.302
  14) 1440.00;  0.126
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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**************************************************************************
  FLOW PROCESS FROM NODE  13000.00 TO NODE  13001.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   279.24
  ELEVATION DATA: UPSTREAM(FEET) =   1187.54  DOWNSTREAM(FEET) =   1104.45

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.560
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.435
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.65      0.30     1.000     0    8.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.25
  TOTAL AREA(ACRES) =      0.65   PEAK FLOW RATE(CFS) =      1.25

**************************************************************************
  FLOW PROCESS FROM NODE  13001.00 TO NODE  13002.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1104.45  DOWNSTREAM(FEET) =   1034.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   736.73   CHANNEL SLOPE =  0.0945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.108
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       19.74      0.30     0.968     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.968
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =   10.57
  SUBAREA AREA(ACRES) =    19.74       SUBAREA RUNOFF(CFS) =   32.29
  EFFECTIVE AREA(ACRES) =     20.39     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =       20.4          PEAK FLOW RATE(CFS) =      33.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   7.73
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13002.00 =    1015.97 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13002.00 TO NODE  13003.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1034.82  DOWNSTREAM(FEET) =    986.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1305.95   CHANNEL SLOPE =  0.0368
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.01
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.873
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.90      0.30     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      94.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.18
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   2.66
  Tc(MIN.) =   13.23
  SUBAREA AREA(ACRES) =    83.90       SUBAREA RUNOFF(CFS) =  120.99
  EFFECTIVE AREA(ACRES) =    104.29     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =      104.3         PEAK FLOW RATE(CFS) =     150.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   9.55
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13003.00 =    2321.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13003.00 TO NODE  13004.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    986.71  DOWNSTREAM(FEET) =    939.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.54   CHANNEL SLOPE =  0.0361
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.697
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.30     0.871     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.871
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     180.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.07
  AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   2.18
  Tc(MIN.) =   15.42
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   61.29
  EFFECTIVE AREA(ACRES) =    151.73     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =     194.73
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.46   FLOW VELOCITY(FEET/SEC.) =  10.31
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13004.00 =    3640.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.06  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1954.61   CHANNEL SLOPE =  0.0397
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.62
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.549
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       77.87      0.30     0.856     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.856
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     240.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.32
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   18.29
  SUBAREA AREA(ACRES) =    77.87       SUBAREA RUNOFF(CFS) =   90.55
  EFFECTIVE AREA(ACRES) =    229.60     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =      229.6         PEAK FLOW RATE(CFS) =     265.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.69   FLOW VELOCITY(FEET/SEC.) =  11.72
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13020.00 =    5595.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.29
  RAINFALL INTENSITY(INCH/HR) =   1.55
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     229.60
  TOTAL STREAM AREA(ACRES) =     229.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     265.08
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13010.00 TO NODE  13011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   284.64
  ELEVATION DATA: UPSTREAM(FEET) =   1190.91  DOWNSTREAM(FEET) =   1110.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.716
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.405
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BROWSH"                -        0.91      0.30     1.000     0    8.72
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.72
  TOTAL AREA(ACRES) =      0.91   PEAK FLOW RATE(CFS) =      1.72

****************************************************************************
  FLOW PROCESS FROM NODE  13011.00 TO NODE  13012.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1110.50  DOWNSTREAM ELEVATION(FEET) = 1068.16
  STREET LENGTH(FEET) =   581.12   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.31
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    8.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.82
  STREET FLOW TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   10.43
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.120
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                 -       10.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   10.46      SUBAREA RUNOFF(CFS) =   17.14
  EFFECTIVE AREA(ACRES) =     11.37    AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
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  TOTAL AREA(ACRES) =       11.4        PEAK FLOW RATE(CFS) =      18.63

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  11.84
  FLOW VELOCITY(FEET/SEC.) =  6.45   DEPTH*VELOCITY(FT*FT/SEC.) =   2.41
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13012.00 =     865.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13012.00 TO NODE  13013.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1068.16  DOWNSTREAM ELEVATION(FEET) =  994.58
  STREET LENGTH(FEET) =  1505.98   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.02
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
    HALFSTREET FLOOD WIDTH(FEET) =   18.40
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.28
  STREET FLOW TRAVEL TIME(MIN.) =   3.75   Tc(MIN.) =   14.18
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.790
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                 -       35.49      0.30     0.901     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.901
  SUBAREA AREA(ACRES) =   35.49      SUBAREA RUNOFF(CFS) =   48.54
  EFFECTIVE AREA(ACRES) =     46.86    AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.93
  TOTAL AREA(ACRES) =       46.9        PEAK FLOW RATE(CFS) =      63.79

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  21.52
  FLOW VELOCITY(FEET/SEC.) =  7.36   DEPTH*VELOCITY(FT*FT/SEC.) =   4.03
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13013.00 =    2371.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13013.00 TO NODE  13014.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    994.58  DOWNSTREAM(FEET) =    944.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1798.86   CHANNEL SLOPE =  0.0276
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.563
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.31      0.30     0.616     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.616
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     109.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.81
  AVERAGE FLOW DEPTH(FEET) =   1.14   TRAVEL TIME(MIN.) =   3.84
  Tc(MIN.) =   18.02
  SUBAREA AREA(ACRES) =    73.31       SUBAREA RUNOFF(CFS) =   90.92
  EFFECTIVE AREA(ACRES) =    120.17     AREA-AVERAGED Fm(INCH/HR) =   0.22
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.74
  TOTAL AREA(ACRES) =      120.2         PEAK FLOW RATE(CFS) =     145.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.34   FLOW VELOCITY(FEET/SEC.) =   8.56
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13014.00 =    4170.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    944.96  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1519.40   CHANNEL SLOPE =  0.0549
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.455
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.22      0.30     0.810     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.810
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     188.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.76
  AVERAGE FLOW DEPTH(FEET) =   1.28   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   20.17
  SUBAREA AREA(ACRES) =    80.22       SUBAREA RUNOFF(CFS) =   87.51
  EFFECTIVE AREA(ACRES) =    200.39     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      200.4         PEAK FLOW RATE(CFS) =     220.99
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.40   FLOW VELOCITY(FEET/SEC.) =  12.34
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  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.17
  RAINFALL INTENSITY(INCH/HR) =   1.46
  AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.77
  EFFECTIVE STREAM AREA(ACRES) =     200.39
  TOTAL STREAM AREA(ACRES) =     200.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     220.99

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      265.08   18.29    1.549  0.30( 0.27) 0.89     229.6   13000.00
      2      220.99   20.17    1.455  0.30( 0.23) 0.77     200.4   13010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      480.79   18.29    1.549  0.30( 0.25) 0.83     411.3   13000.00
      2      466.70   20.17    1.455  0.30( 0.25) 0.83     430.0   13010.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     480.79    Tc(MIN.) =    18.29
  EFFECTIVE AREA(ACRES) =     411.31   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =      430.0
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13020.00 TO NODE  13021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    861.53  DOWNSTREAM(FEET) =    843.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1274.71   CHANNEL SLOPE =  0.0139
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.41
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.414
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.78      0.30     0.818     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.818
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     523.28
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.90
 AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   3.08
 Tc(MIN.) =   21.37
 SUBAREA AREA(ACRES) =    80.78       SUBAREA RUNOFF(CFS) =   84.95
 EFFECTIVE AREA(ACRES) =    492.09     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =      510.8         PEAK FLOW RATE(CFS) =     515.80
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.39

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.39   FLOW VELOCITY(FEET/SEC.) =   6.87
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13021.00 =    6964.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      515.80   21.37    1.414  0.30( 0.25) 0.83     492.1   13000.00
     2      505.49   23.28    1.348  0.30( 0.25) 0.83     510.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     515.80  Tc(MIN.) =   21.37
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     492.09

****************************************************************************
 FLOW PROCESS FROM NODE  13021.00 TO NODE  13022.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    843.84  DOWNSTREAM(FEET) =    842.14
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1448.62   CHANNEL SLOPE =  0.0012
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.05
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.203
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      124.44      0.30     0.803     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.803
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     569.76
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.20
 AVERAGE FLOW DEPTH(FEET) =   3.02   TRAVEL TIME(MIN.) =   7.55
 Tc(MIN.) =   28.92
 SUBAREA AREA(ACRES) =   124.44       SUBAREA RUNOFF(CFS) =  107.81
 EFFECTIVE AREA(ACRES) =    616.53     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =      635.2         PEAK FLOW RATE(CFS) =     530.43
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.90

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  2.90   FLOW VELOCITY(FEET/SEC.) =   3.12
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13022.00 =    8413.33 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      530.43   28.92    1.203  0.30( 0.25) 0.83     616.5   13000.00
     2      523.69   30.89    1.163  0.30( 0.25) 0.82     635.2   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     530.43  Tc(MIN.) =   28.92
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     616.53

****************************************************************************
 FLOW PROCESS FROM NODE  13022.00 TO NODE  13023.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    842.14  DOWNSTREAM(FEET) =    806.85
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.95   CHANNEL SLOPE =  0.0246
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.37
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      324.46      0.30     0.786     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.786
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     663.96
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.02
 AVERAGE FLOW DEPTH(FEET) =   1.36   TRAVEL TIME(MIN.) =   2.65
 Tc(MIN.) =   31.57
 SUBAREA AREA(ACRES) =   324.46       SUBAREA RUNOFF(CFS) =  267.01
 EFFECTIVE AREA(ACRES) =    940.99     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =      959.7         PEAK FLOW RATE(CFS) =     767.86
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   9.55
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13023.00 =    9846.28 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      767.86   31.57    1.150  0.30( 0.24) 0.81     941.0   13000.00
     2      750.74   33.56    1.112  0.30( 0.24) 0.81     959.7   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     767.86  Tc(MIN.) =   31.57
 AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =     940.99

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 FLOW PROCESS FROM NODE  13023.00 TO NODE  13024.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    806.85  DOWNSTREAM(FEET) =    767.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =   940.17   CHANNEL SLOPE =  0.0423
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.40
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.125
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      367.12      0.30     0.795     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.795
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     914.41
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.06
 AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   1.30
 Tc(MIN.) =   32.87
 SUBAREA AREA(ACRES) =   367.12       SUBAREA RUNOFF(CFS) =  293.07
 EFFECTIVE AREA(ACRES) =   1308.11     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     1326.8         PEAK FLOW RATE(CFS) =    1040.03
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =  12.65
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13024.00 =   10786.45 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1040.03   32.87    1.125  0.30( 0.24) 0.81    1308.1   13000.00
     2     1009.74   34.87    1.087  0.30( 0.24) 0.81    1326.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1040.03  Tc(MIN.) =   32.87
 AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1308.11

****************************************************************************
 FLOW PROCESS FROM NODE  13024.00 TO NODE  13025.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    767.07  DOWNSTREAM(FEET) =    697.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3026.62   CHANNEL SLOPE =  0.0230
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.037
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
 USER-DEFINED               -      315.24      0.30     0.867     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1150.25
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.79
 AVERAGE FLOW DEPTH(FEET) =   1.91   TRAVEL TIME(MIN.) =   4.67
 Tc(MIN.) =   37.55
 SUBAREA AREA(ACRES) =   315.24       SUBAREA RUNOFF(CFS) =  220.34
 EFFECTIVE AREA(ACRES) =   1623.35     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
 TOTAL AREA(ACRES) =     1642.0         PEAK FLOW RATE(CFS) =    1155.82
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.92

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.92   FLOW VELOCITY(FEET/SEC.) =  10.80
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13025.00 =   13813.07 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1155.82   37.55    1.037  0.30( 0.25) 0.82    1623.3   13000.00
     2     1111.57   39.60    0.998  0.30( 0.25) 0.82    1642.0   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1155.82  Tc(MIN.) =   37.55
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    1623.35

****************************************************************************
 FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    697.38  DOWNSTREAM(FEET) =    662.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.69   CHANNEL SLOPE =  0.0147
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.33
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.971
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      374.11      0.30     0.748     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.748
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1281.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.68
 AVERAGE FLOW DEPTH(FEET) =   2.32   TRAVEL TIME(MIN.) =   4.07
 Tc(MIN.) =   41.61
 SUBAREA AREA(ACRES) =   374.11       SUBAREA RUNOFF(CFS) =  251.44
 EFFECTIVE AREA(ACRES) =   1997.46     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     2016.1         PEAK FLOW RATE(CFS) =    1311.52
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.35
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.35   FLOW VELOCITY(FEET/SEC.) =   9.76
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13026.00 =   16175.76 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1311.52   41.61    0.971  0.30( 0.24) 0.81    1997.5   13000.00
      2     1279.19   43.72    0.946  0.30( 0.24) 0.81    2016.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1311.52  Tc(MIN.) =   41.61
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1997.46
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     2016.1  TC(MIN.) =     41.61
  EFFECTIVE AREA(ACRES) =   1997.46  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.805
  PEAK FLOW RATE(CFS)   =    1311.52

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1311.52   41.61    0.971  0.30( 0.24) 0.81    1997.5   13000.00
      2     1279.19   43.72    0.946  0.30( 0.24) 0.81    2016.1   13010.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S31.DAT
  TIME/DATE OF STUDY: 13:51 04/03/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.120
   2)   10.00;  2.158
   3)   15.00;  1.718
   4)   20.00;  1.461
   5)   25.00;  1.289
   6)   30.00;  1.180
   7)   40.00;  0.990
   8)   50.00;  0.873
   9)   60.00;  0.780
  10)   90.00;  0.628
  11)  120.00;  0.534
  12)  180.00;  0.437
  13)  360.00;  0.302
  14) 1440.00;  0.126
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13100.00 TO NODE  13101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   282.58
  ELEVATION DATA: UPSTREAM(FEET) =   1069.66  DOWNSTREAM(FEET) =    969.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.312
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.483
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.94      0.30     1.000     0    8.31
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.85
  TOTAL AREA(ACRES) =      0.94   PEAK FLOW RATE(CFS) =      1.85

****************************************************************************
  FLOW PROCESS FROM NODE  13101.00 TO NODE  13102.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    969.92  DOWNSTREAM(FEET) =    807.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.89   CHANNEL SLOPE =  0.2444
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.21
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.061
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.97
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   11.11
  SUBAREA AREA(ACRES) =     7.67       SUBAREA RUNOFF(CFS) =   12.15
  EFFECTIVE AREA(ACRES) =      8.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.6          PEAK FLOW RATE(CFS) =      13.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   4.91
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13102.00 =     948.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13102.00 TO NODE  13103.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    807.20  DOWNSTREAM(FEET) =    769.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   691.01   CHANNEL SLOPE =  0.0539
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.66
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.800
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       20.65      0.30     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.90
  AVERAGE FLOW DEPTH(FEET) =   0.63   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   14.06
  SUBAREA AREA(ACRES) =    20.65       SUBAREA RUNOFF(CFS) =   27.89
  EFFECTIVE AREA(ACRES) =     29.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3        PEAK FLOW RATE(CFS) =      39.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   4.38
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13103.00 =    1639.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   769.94  DOWNSTREAM(FEET) =   693.88
  FLOW LENGTH(FEET) =  1563.10   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  13.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.99
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      39.52
  PIPE TRAVEL TIME(MIN.) =   1.53    Tc(MIN.) =   15.60
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13104.00 =    3202.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.60
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.687
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       28.00      0.30     0.750     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.750
  SUBAREA AREA(ACRES) =   28.00      SUBAREA RUNOFF(CFS) =   36.85
  EFFECTIVE AREA(ACRES) =     57.26   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =       57.3       PEAK FLOW RATE(CFS) =      73.39

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   693.88  DOWNSTREAM(FEET) =   645.69
  FLOW LENGTH(FEET) =  1068.98   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  19.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.43
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      73.39
  PIPE TRAVEL TIME(MIN.) =   0.92    Tc(MIN.) =   16.51
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13105.00 =    4271.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.51
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.640
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.28      0.30     0.867     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
  SUBAREA AREA(ACRES) =   35.28      SUBAREA RUNOFF(CFS) =   43.82
  EFFECTIVE AREA(ACRES) =     92.54   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =       92.5       PEAK FLOW RATE(CFS) =     114.79

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.69  DOWNSTREAM(FEET) =   608.48
  FLOW LENGTH(FEET) =  1127.55   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.54
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     114.79
  PIPE TRAVEL TIME(MIN.) =   1.01    Tc(MIN.) =   17.53
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   17.53
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.588
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       37.68      0.30     0.889     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
 SUBAREA AREA(ACRES) =   37.68      SUBAREA RUNOFF(CFS) =   44.81
 EFFECTIVE AREA(ACRES) =    130.22   AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
 TOTAL AREA(ACRES) =      130.2       PEAK FLOW RATE(CFS) =     155.26

****************************************************************************
 FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S30.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1311.52   41.61  0.30( 0.24) 0.81    1997.5   13000.00
     2     1279.19   43.72  0.30( 0.24) 0.81    2016.1   13010.00
   TOTAL AREA(ACRES) =     2016.1

****************************************************************************
 FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1311.52   41.61  0.30( 0.24) 0.81    1997.5   13000.00
     2     1279.19   43.72  0.30( 0.24) 0.81    2016.1   13010.00
   TOTAL AREA(ACRES) =      2016.1

****************************************************************************
 FLOW PROCESS FROM NODE  13026.00 TO NODE  13106.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    662.66  DOWNSTREAM(FEET) =    608.48
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3098.88   CHANNEL SLOPE =  0.0175
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
```



```
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.26
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.913
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       75.28      0.30     0.755     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1334.78
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.39
 AVERAGE FLOW DEPTH(FEET) =   2.26   TRAVEL TIME(MIN.) =   4.97
 Tc(MIN.) =   46.59
 SUBAREA AREA(ACRES) =    75.28       SUBAREA RUNOFF(CFS) =   46.51
 EFFECTIVE AREA(ACRES) =   2072.74     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
 TOTAL AREA(ACRES) =     2091.4         PEAK FLOW RATE(CFS) =    1311.52
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.24

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.24   FLOW VELOCITY(FEET/SEC.) =  10.32
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1311.52   46.59    0.913  0.30( 0.24) 0.80    2072.7   13000.00
     2     1279.19   48.74    0.888  0.30( 0.24) 0.80    2091.4   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1311.52  Tc(MIN.) =   46.59
 AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    2072.74

****************************************************************************
 FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1311.52   46.59    0.913  0.30( 0.24) 0.80    2072.7   13000.00
     2     1279.19   48.74    0.888  0.30( 0.24) 0.80    2091.4   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      155.26   17.53    1.588  0.30( 0.26) 0.88     130.2   13100.00
 LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
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      1     1144.52   17.53    1.588  0.30( 0.24) 0.81     910.1   13100.00
      2     1387.66   46.59    0.913  0.30( 0.24) 0.81    2203.0   13000.00
      3     1352.37   48.74    0.888  0.30( 0.24) 0.81    2221.6   13010.00
    TOTAL AREA(ACRES) =      2221.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1387.66  Tc(MIN.) =   46.586
  EFFECTIVE AREA(ACRES) =   2202.96  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     2221.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13106.00 TO NODE  13107.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    608.48  DOWNSTREAM(FEET) =    584.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1650.20   CHANNEL SLOPE =  0.0147
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.50
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.881
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      190.45      0.30     0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1443.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.08
  AVERAGE FLOW DEPTH(FEET) =   2.49   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   49.31
  SUBAREA AREA(ACRES) =   190.45       SUBAREA RUNOFF(CFS) =  112.20
  EFFECTIVE AREA(ACRES) =   2393.41     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     2412.1         PEAK FLOW RATE(CFS) =    1387.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.44   FLOW VELOCITY(FEET/SEC.) =   9.94
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13107.00 =   20924.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1194.70   20.40    1.447  0.30( 0.24) 0.80    1100.5   13100.00
      2     1387.66   49.31    0.881  0.30( 0.24) 0.80    2393.4   13000.00
      3     1352.37   51.49    0.859  0.30( 0.24) 0.80    2412.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1387.66  Tc(MIN.) =   49.31
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    2393.41
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****************************************************************************
  FLOW PROCESS FROM NODE  13107.00 TO NODE  13108.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.29  DOWNSTREAM(FEET) =    563.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1061.67   CHANNEL SLOPE =  0.0193
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.865
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      314.12      0.30     0.939     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.939
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1470.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.10
  AVERAGE FLOW DEPTH(FEET) =   2.32   TRAVEL TIME(MIN.) =   1.59
  Tc(MIN.) =   50.91
  SUBAREA AREA(ACRES) =   314.12       SUBAREA RUNOFF(CFS) =  164.79
  EFFECTIVE AREA(ACRES) =   2707.53     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     2726.2         PEAK FLOW RATE(CFS) =    1507.80
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.36   FLOW VELOCITY(FEET/SEC.) =  11.19
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13108.00 =   21986.51 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1452.29   22.04    1.391  0.30( 0.25) 0.83    1414.6   13100.00
      2     1507.80   50.91    0.865  0.30( 0.25) 0.82    2707.5   13000.00
      3     1468.37   53.10    0.844  0.30( 0.25) 0.82    2726.2   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1507.80  Tc(MIN.) =   50.91
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2707.53

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  FLOW PROCESS FROM NODE  13108.00 TO NODE  13109.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    563.78  DOWNSTREAM(FEET) =    541.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1657.28   CHANNEL SLOPE =  0.0134
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.68
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.839
  SUBAREA LOSS RATE DATA(AMC  II):
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 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED                -      203.63      0.30     0.785     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.785
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1563.11
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.05
AVERAGE FLOW DEPTH(FEET) =   2.68   TRAVEL TIME(MIN.) =   2.75
Tc(MIN.) =   53.66
SUBAREA AREA(ACRES) =   203.63       SUBAREA RUNOFF(CFS) =  110.61
EFFECTIVE AREA(ACRES) =   2911.16     AREA-AVERAGED Fm(INCH/HR) =   0.25
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
TOTAL AREA(ACRES) =     2929.8         PEAK FLOW RATE(CFS) =    1556.10
GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) =   2.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  2.67   FLOW VELOCITY(FEET/SEC.) =  10.03
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13109.00 =   23643.79 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1525.96   24.80    1.296  0.30( 0.25) 0.83    1618.3   13100.00
    2     1556.10   53.66    0.839  0.30( 0.25) 0.82    2911.2   13000.00
    3     1511.96   55.88    0.818  0.30( 0.24) 0.82    2929.8   13010.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =    1556.10  Tc(MIN.) =   53.66
AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2911.16

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 FLOW PROCESS FROM NODE  13109.00 TO NODE  13110.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    541.61  DOWNSTREAM(FEET) =    509.94
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2016.96   CHANNEL SLOPE =  0.0157
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.62
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.810
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -      283.06      0.30     0.791     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.791
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1629.04
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.75
 AVERAGE FLOW DEPTH(FEET) =   2.62   TRAVEL TIME(MIN.) =   3.13
 Tc(MIN.) =   56.79
 SUBAREA AREA(ACRES) =   283.06       SUBAREA RUNOFF(CFS) =  145.88
 EFFECTIVE AREA(ACRES) =   3194.22     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     3212.9         PEAK FLOW RATE(CFS) =    1625.77
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 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.62

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.62   FLOW VELOCITY(FEET/SEC.) =  10.73
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13110.00 =   25660.75 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1675.08   27.91    1.226  0.30( 0.25) 0.82    1901.3   13100.00
     2     1625.77   56.79    0.810  0.30( 0.24) 0.81    3194.2   13000.00
     3     1575.04   59.04    0.789  0.30( 0.24) 0.81    3212.9   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1675.08  Tc(MIN.) =   27.91
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    1901.34

****************************************************************************
 FLOW PROCESS FROM NODE  13110.00 TO NODE  13111.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    509.94  DOWNSTREAM(FEET) =    461.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3058.95   CHANNEL SLOPE =  0.0160
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.75
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.133
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -      248.05      0.30     0.783     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1775.30
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.12
 AVERAGE FLOW DEPTH(FEET) =   2.74   TRAVEL TIME(MIN.) =   4.58
 Tc(MIN.) =   32.50
 SUBAREA AREA(ACRES) =   248.05       SUBAREA RUNOFF(CFS) =  200.41
 EFFECTIVE AREA(ACRES) =   2149.39     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
 TOTAL AREA(ACRES) =     3460.9         PEAK FLOW RATE(CFS) =    1716.43
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.69

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.69   FLOW VELOCITY(FEET/SEC.) =  11.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13111.00 =   28719.70 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1716.43   32.50    1.133  0.30( 0.25) 0.82    2149.4   13100.00
     2     1638.79   61.45    0.773  0.30( 0.24) 0.81    3442.3   13000.00
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     3     1611.62   63.75    0.761  0.30( 0.24) 0.81    3460.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1716.43  Tc(MIN.) =   32.50
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2149.39

****************************************************************************
  FLOW PROCESS FROM NODE  13111.00 TO NODE  13112.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    461.07  DOWNSTREAM(FEET) =    452.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1781.78   CHANNEL SLOPE =  0.0047
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.92
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.056
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      179.91      0.30     0.694     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.694
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1785.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.39
  AVERAGE FLOW DEPTH(FEET) =   3.91   TRAVEL TIME(MIN.) =   4.02
  Tc(MIN.) =   36.51
  SUBAREA AREA(ACRES) =   179.91       SUBAREA RUNOFF(CFS) =  137.32
  EFFECTIVE AREA(ACRES) =   2329.30     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3640.9         PEAK FLOW RATE(CFS) =    1716.43
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.83   FLOW VELOCITY(FEET/SEC.) =   7.29
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13112.00 =   30501.48 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1716.43   36.51    1.056  0.30( 0.24) 0.81    2329.3   13100.00
      2     1662.58   65.54    0.752  0.30( 0.24) 0.81    3622.2   13000.00
      3     1632.72   67.87    0.740  0.30( 0.24) 0.81    3640.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1716.43  Tc(MIN.) =   36.51
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    2329.30

****************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    452.77  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1625.01   CHANNEL SLOPE =  0.0155
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.010
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      155.96      0.30     0.836     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.836
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1769.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.02
  AVERAGE FLOW DEPTH(FEET) =   2.76   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   38.97
  SUBAREA AREA(ACRES) =   155.96       SUBAREA RUNOFF(CFS) =  106.51
  EFFECTIVE AREA(ACRES) =   2485.26     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3796.8         PEAK FLOW RATE(CFS) =    1716.43
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.71   FLOW VELOCITY(FEET/SEC.) =  10.89
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1716.43   38.97    1.010  0.30( 0.24) 0.81    2485.3   13100.00
      2     1689.97   68.04    0.739  0.30( 0.24) 0.81    3778.1   13000.00
      3     1658.02   70.38    0.727  0.30( 0.24) 0.81    3796.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1716.43  Tc(MIN.) =   38.97
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    2485.26
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3796.8  TC(MIN.) =     38.97
  EFFECTIVE AREA(ACRES) =   2485.26  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.810
  PEAK FLOW RATE(CFS)   =    1716.43

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1716.43   38.97    1.010  0.30( 0.24) 0.81    2485.3   13100.00
      2     1689.97   68.04    0.739  0.30( 0.24) 0.81    3778.1   13000.00
      3     1658.02   70.38    0.727  0.30( 0.24) 0.81    3796.8   13010.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S32.DAT
  TIME/DATE OF STUDY: 13:51 04/03/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.120
   2)   10.00;  2.158
   3)   15.00;  1.718
   4)   20.00;  1.461
   5)   25.00;  1.289
   6)   30.00;  1.180
   7)   40.00;  0.990
   8)   50.00;  0.873
   9)   60.00;  0.780
  10)   90.00;  0.628
  11)  120.00;  0.534
  12)  180.00;  0.437
  13)  360.00;  0.302
  14) 1440.00;  0.126
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13200.00 TO NODE  13201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.57
  ELEVATION DATA: UPSTREAM(FEET) =   1069.04  DOWNSTREAM(FEET) =   1005.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.410
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.272
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.67      0.30     1.000     0    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.19
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      1.19

****************************************************************************
  FLOW PROCESS FROM NODE  13201.00 TO NODE  13202.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.76  DOWNSTREAM(FEET) =    896.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   747.55   CHANNEL SLOPE =  0.1455
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.854
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.08
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   13.45
  SUBAREA AREA(ACRES) =     7.41       SUBAREA RUNOFF(CFS) =   10.37
  EFFECTIVE AREA(ACRES) =      8.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.1          PEAK FLOW RATE(CFS) =      11.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   3.86
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13202.00 =    1046.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  31
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   896.98  DOWNSTREAM(FEET) =   840.27
  FLOW LENGTH(FEET) =  1789.59   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.20
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.30
  PIPE TRAVEL TIME(MIN.) =   2.92    Tc(MIN.) =   16.37
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13203.00 =    2835.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   16.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.647
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.89      0.30     0.731     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.731
  SUBAREA AREA(ACRES) =   38.89      SUBAREA RUNOFF(CFS) =   49.99
  EFFECTIVE AREA(ACRES) =     46.97   AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.78
  TOTAL AREA(ACRES) =       47.0       PEAK FLOW RATE(CFS) =      59.78

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   840.27  DOWNSTREAM(FEET) =   782.97
  FLOW LENGTH(FEET) =   992.54   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.22
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      59.78
  PIPE TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =   17.19
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13204.00 =    3828.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   17.19
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.605
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       83.09      0.30     0.645     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.645
  SUBAREA AREA(ACRES) =   83.09      SUBAREA RUNOFF(CFS) =  105.58
  EFFECTIVE AREA(ACRES) =    130.06   AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      130.1       PEAK FLOW RATE(CFS) =     163.59

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   782.97  DOWNSTREAM(FEET) =   692.52
  FLOW LENGTH(FEET) =  2046.57   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  31.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.63
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     163.59
  PIPE TRAVEL TIME(MIN.) =   1.51    Tc(MIN.) =   18.70
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13205.00 =    5874.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   18.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.528
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       88.51      0.30     0.679     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.679
  SUBAREA AREA(ACRES) =   88.51      SUBAREA RUNOFF(CFS) =  105.48
  EFFECTIVE AREA(ACRES) =    218.57   AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      218.6       PEAK FLOW RATE(CFS) =     260.00

****************************************************************************
  FLOW PROCESS FROM NODE  13205.00 TO NODE  13206.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    692.52  DOWNSTREAM(FEET) =    605.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2704.69   CHANNEL SLOPE =  0.0323
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.344
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      163.73      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     340.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.58
  AVERAGE FLOW DEPTH(FEET) =   2.40   TRAVEL TIME(MIN.) =   4.71
  Tc(MIN.) =   23.41
  SUBAREA AREA(ACRES) =   163.73       SUBAREA RUNOFF(CFS) =  160.10
  EFFECTIVE AREA(ACRES) =    382.30     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.76
  TOTAL AREA(ACRES) =      382.3         PEAK FLOW RATE(CFS) =     383.89
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.57   FLOW VELOCITY(FEET/SEC.) =   9.89
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13206.00 =    8579.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13206.00 TO NODE  13207.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.24  DOWNSTREAM(FEET) =    555.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2479.15   CHANNEL SLOPE =  0.0201
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.18
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.220
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      143.41      0.30     0.888     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.888
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     445.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.71
  AVERAGE FLOW DEPTH(FEET) =   3.14   TRAVEL TIME(MIN.) =   4.74
  Tc(MIN.) =   28.15
  SUBAREA AREA(ACRES) =   143.41       SUBAREA RUNOFF(CFS) =  123.13
  EFFECTIVE AREA(ACRES) =    525.71     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      525.7         PEAK FLOW RATE(CFS) =     464.55
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.21   FLOW VELOCITY(FEET/SEC.) =   8.82
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13207.00 =   11058.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    555.41  DOWNSTREAM(FEET) =    505.65
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1734.55   CHANNEL SLOPE =  0.0287
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.10
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.162
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.56      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     514.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.31
  AVERAGE FLOW DEPTH(FEET) =   3.09   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   30.95
  SUBAREA AREA(ACRES) =   123.56       SUBAREA RUNOFF(CFS) =  100.59
  EFFECTIVE AREA(ACRES) =    649.27     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      649.3         PEAK FLOW RATE(CFS) =     537.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.16   FLOW VELOCITY(FEET/SEC.) =  10.44
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.95
  RAINFALL INTENSITY(INCH/HR) =   1.16
  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81
  EFFECTIVE STREAM AREA(ACRES) =     649.27
  TOTAL STREAM AREA(ACRES) =     649.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     537.49

****************************************************************************
  FLOW PROCESS FROM NODE  13210.00 TO NODE  13211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   314.51
  ELEVATION DATA: UPSTREAM(FEET) =    949.80  DOWNSTREAM(FEET) =    828.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.525
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.442
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  NATURAL FAIR COVER
  "OPEN BRUSH"                -       1.96      0.30     1.000     0    8.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.78
  TOTAL AREA(ACRES) =      1.96   PEAK FLOW RATE(CFS) =      3.78

****************************************************************************
  FLOW PROCESS FROM NODE  13211.00 TO NODE  13212.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    828.64  DOWNSTREAM(FEET) =    767.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   652.49   CHANNEL SLOPE =  0.0930
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.017
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.54
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   3.07
  Tc(MIN.) =   11.60
  SUBAREA AREA(ACRES) =    11.95       SUBAREA RUNOFF(CFS) =   18.47
  EFFECTIVE AREA(ACRES) =     13.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.9         PEAK FLOW RATE(CFS) =      21.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   4.25
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13212.00 =     967.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13212.00 TO NODE  13213.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    767.94  DOWNSTREAM(FEET) =    706.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.91   CHANNEL SLOPE =  0.0635
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.77
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.712
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   3.51
  Tc(MIN.) =   15.11
  SUBAREA AREA(ACRES) =    27.07       SUBAREA RUNOFF(CFS) =   34.41
  EFFECTIVE AREA(ACRES) =     40.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.0         PEAK FLOW RATE(CFS) =      52.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   5.08
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13213.00 =    1934.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13213.00 TO NODE  13214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    706.43  DOWNSTREAM(FEET) =    659.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.11   CHANNEL SLOPE =  0.0497
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.05
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.550
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.99
  AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   3.17
  Tc(MIN.) =   18.28
  SUBAREA AREA(ACRES) =    18.09       SUBAREA RUNOFF(CFS) =   20.35
  EFFECTIVE AREA(ACRES) =     59.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       59.1         PEAK FLOW RATE(CFS) =      66.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   5.07
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13214.00 =    2883.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13214.00 TO NODE  13215.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    659.31  DOWNSTREAM(FEET) =    628.91
```

```
 CHANNEL LENGTH THRU SUBAREA(FEET) =   970.24   CHANNEL SLOPE =  0.0313
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.60
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.408
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       71.42      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     102.12
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.96
 AVERAGE FLOW DEPTH(FEET) =   1.57   TRAVEL TIME(MIN.) =   3.26
 Tc(MIN.) =   21.53
 SUBAREA AREA(ACRES) =    71.42       SUBAREA RUNOFF(CFS) =   71.24
 EFFECTIVE AREA(ACRES) =    130.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      130.5         PEAK FLOW RATE(CFS) =     130.16
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.79

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.79   FLOW VELOCITY(FEET/SEC.) =   5.35
 LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13215.00 =    3853.26 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13215.00 TO NODE  13216.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    628.91  DOWNSTREAM(FEET) =    598.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =   922.63   CHANNEL SLOPE =  0.0331
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.89
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.315
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       36.33      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     146.75
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.67
 AVERAGE FLOW DEPTH(FEET) =   1.88   TRAVEL TIME(MIN.) =   2.71
 Tc(MIN.) =   24.25
 SUBAREA AREA(ACRES) =    36.33       SUBAREA RUNOFF(CFS) =   33.18
 EFFECTIVE AREA(ACRES) =    166.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      166.8         PEAK FLOW RATE(CFS) =     152.38
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
 DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   5.71
 LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13216.00 =    4775.89 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13216.00 TO NODE  13217.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    598.39  DOWNSTREAM(FEET) =    568.48
 CHANNEL LENGTH THRU SUBAREA(FEET) =   636.40   CHANNEL SLOPE =  0.0470
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.271
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       42.51      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     170.95
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.70
 AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   1.58
 Tc(MIN.) =   25.83
 SUBAREA AREA(ACRES) =    42.51       SUBAREA RUNOFF(CFS) =   37.15
 EFFECTIVE AREA(ACRES) =    209.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      209.3         PEAK FLOW RATE(CFS) =     182.93
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   6.82
 LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13217.00 =    5412.29 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    568.48  DOWNSTREAM(FEET) =    505.65
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.50   CHANNEL SLOPE =  0.0331
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.164
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       73.24      0.30     0.951     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     211.91
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.31
 AVERAGE FLOW DEPTH(FEET) =   2.30   TRAVEL TIME(MIN.) =   5.01
```

```
  Tc(MIN.) =   30.84
  SUBAREA AREA(ACRES) =    73.24       SUBAREA RUNOFF(CFS) =   57.92
  EFFECTIVE AREA(ACRES) =    282.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      282.6         PEAK FLOW RATE(CFS) =     220.71
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.35   FLOW VELOCITY(FEET/SEC.) =   6.38
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13220.00 =    7308.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.84
  RAINFALL INTENSITY(INCH/HR) =   1.16
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     282.57
  TOTAL STREAM AREA(ACRES) =     282.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     220.71

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      537.49   30.95    1.162  0.30( 0.24) 0.81     649.3   13200.00
      2      220.71   30.84    1.164  0.30( 0.30) 0.99     282.6   13210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      757.50   30.84    1.164  0.30( 0.26) 0.86     929.5   13210.00
      2      757.66   30.95    1.162  0.30( 0.26) 0.86     931.8   13200.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     757.66    Tc(MIN.) =    30.95
  EFFECTIVE AREA(ACRES) =     931.84   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      931.8
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13220.00 TO NODE  13221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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```
  ELEVATION DATA: UPSTREAM(FEET) =    505.65  DOWNSTREAM(FEET) =    478.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1949.14   CHANNEL SLOPE =  0.0137
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.04
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.106
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      108.50      0.30     0.637     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.637
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     802.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.98
  AVERAGE FLOW DEPTH(FEET) =   4.04   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   33.91
  SUBAREA AREA(ACRES) =   108.50       SUBAREA RUNOFF(CFS) =   89.31
  EFFECTIVE AREA(ACRES) =   1040.34     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     1040.3         PEAK FLOW RATE(CFS) =     799.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.04   FLOW VELOCITY(FEET/SEC.) =  10.95
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13221.00 =   14742.35 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      799.99   33.80    1.108  0.30( 0.25) 0.84    1038.0   13210.00
      2      799.84   33.91    1.106  0.30( 0.25) 0.84    1040.3   13200.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     799.99  Tc(MIN.) =   33.80
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =    1038.03

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    478.94  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2078.70   CHANNEL SLOPE =  0.0247
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.54
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.060
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.26      0.30     0.699     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.699
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     833.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.76
```

```
 AVERAGE FLOW DEPTH(FEET) =   3.54   TRAVEL TIME(MIN.) =   2.52
 Tc(MIN.) =   36.32
 SUBAREA AREA(ACRES) =    87.26       SUBAREA RUNOFF(CFS) =   66.78
 EFFECTIVE AREA(ACRES) =   1125.29     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =     1127.6         PEAK FLOW RATE(CFS) =     822.07
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.52

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.52   FLOW VELOCITY(FEET/SEC.) =  13.69
 LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      822.07   36.32    1.060  0.30( 0.25) 0.83    1125.3   13210.00
     2      821.63   36.43    1.058  0.30( 0.25) 0.83    1127.6   13200.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     822.07  Tc(MIN.) =   36.32
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =    1125.29
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1127.6  TC(MIN.) =     36.32
 EFFECTIVE AREA(ACRES) =   1125.29  AREA-AVERAGED Fm(INCH/HR)=  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.828
 PEAK FLOW RATE(CFS)   =     822.07

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      822.07   36.32    1.060  0.30( 0.25) 0.83    1125.3   13210.00
     2      821.63   36.43    1.058  0.30( 0.25) 0.83    1127.6   13200.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S33.DAT
  TIME/DATE OF STUDY: 09:01 09/12/2017
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.772
   2)   10.00;  2.516
   3)   15.00;  1.862
   4)   20.00;  1.593
   5)   25.00;  1.391
   6)   30.00;  1.250
   7)   40.00;  1.068
   8)   50.00;  0.950
   9)   60.00;  0.862
  10)   90.00;  0.714
  11)  120.00;  0.629
  12)  180.00;  0.527
  13)  360.00;  0.388
  14) 1200.00;  0.170
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S31.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1716.43   38.97  0.30( 0.24) 0.81    2485.3   13100.00
      2     1689.97   68.04  0.30( 0.24) 0.81    3778.1   13000.00
      3     1658.02   70.38  0.30( 0.24) 0.81    3796.8   13010.00
    TOTAL AREA(ACRES) =     3796.8

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S32.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      822.07   36.32  0.30( 0.25) 0.83    1125.3   13210.00
      2      821.63   36.43  0.30( 0.25) 0.83    1127.6   13200.00
    TOTAL AREA(ACRES) =     1127.6

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      822.07   36.32  0.30( 0.25) 0.83    1125.3   13210.00
      2      821.63   36.43  0.30( 0.25) 0.83    1127.6   13200.00
    TOTAL AREA(ACRES) =      1127.6

****************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      822.07   36.32    1.135  0.30( 0.25) 0.83    1125.3   13210.00
      2      821.63   36.43    1.133  0.30( 0.25) 0.83    1127.6   13200.00
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1716.43   38.97    1.087  0.30( 0.24) 0.81    2485.3   13100.00
      2     1689.97   68.04    0.822  0.30( 0.24) 0.81    3778.1   13000.00
```

```
     3     1658.02   70.38    0.811  0.30( 0.24) 0.81    3796.8   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2513.19   36.32    1.135  0.30( 0.24) 0.82    3441.4   13210.00
      2     2514.08   36.43    1.133  0.30( 0.24) 0.82    3450.8   13200.00
      3     2495.11   38.97    1.087  0.30( 0.24) 0.82    3612.9   13100.00
      4     2223.15   68.04    0.822  0.30( 0.24) 0.81    4905.7   13000.00
      5     2180.47   70.38    0.811  0.30( 0.24) 0.81    4924.4   13010.00
    TOTAL AREA(ACRES) =      4924.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2514.08  Tc(MIN.) =   36.430
  EFFECTIVE AREA(ACRES) =   3450.80  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4924.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13223.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    416.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   864.00   CHANNEL SLOPE =  0.0129
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.19
  CHANNEL FLOW THRU SUBAREA(CFS) =    2514.08
  FLOW VELOCITY(FEET/SEC.) =   9.58   FLOW DEPTH(FEET) =   4.19
  TRAVEL TIME(MIN.) =   1.50   Tc(MIN.) =   37.93
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2672.83   37.82    1.108  0.30( 0.24) 0.82    3441.4   13210.00
      2     2673.90   37.93    1.106  0.30( 0.24) 0.82    3450.8   13200.00
      3     2659.06   40.48    1.062  0.30( 0.24) 0.82    3612.9   13100.00
      4     2521.03   69.60    0.815  0.30( 0.24) 0.81    4905.7   13000.00
      5     2479.45   71.95    0.803  0.30( 0.24) 0.81    4924.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2673.90  Tc(MIN.) =   37.93
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    3450.80

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE = 15.1
----------------------------------------------------------------------------
```



```
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610301V.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       49.47   12.59  0.30( 0.30) 1.00      29.3   30100.00
      2       41.32   15.28  0.30( 0.30) 1.00      29.7   30110.00
    TOTAL AREA(ACRES) =       29.7

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2672.83   37.82    1.108  0.30( 0.24) 0.82    3441.4   13210.00
      2     2673.90   37.93    1.106  0.30( 0.24) 0.82    3450.8   13200.00
      3     2659.06   40.48    1.062  0.30( 0.24) 0.82    3612.9   13100.00
      4     2521.03   69.60    0.815  0.30( 0.24) 0.81    4905.7   13000.00
      5     2479.45   71.95    0.803  0.30( 0.24) 0.81    4924.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       49.47   12.59    2.177  0.30( 0.30) 1.00      29.3   30100.00
      2       41.32   15.28    1.847  0.30( 0.30) 1.00      29.7   30110.00
  LONGEST FLOWPATH FROM NODE  30110.00 TO NODE  13223.00 =    2058.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2042.00   12.59    2.177  0.30( 0.25) 0.82    1175.2   30100.00
      2     2046.33   15.28    1.847  0.30( 0.25) 0.82    1420.2   30110.00
      3     2694.41   37.82    1.108  0.30( 0.25) 0.82    3471.1   13210.00
      4     2695.42   37.93    1.106  0.30( 0.25) 0.82    3480.5   13200.00
      5     2679.42   40.48    1.062  0.30( 0.25) 0.82    3642.5   13100.00
      6     2534.78   69.60    0.815  0.30( 0.24) 0.81    4935.4   13000.00
      7     2492.89   71.95    0.803  0.30( 0.24) 0.81    4954.1   13010.00
    TOTAL AREA(ACRES) =      4954.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2695.42  Tc(MIN.) =   37.933
  EFFECTIVE AREA(ACRES) =   3480.48  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4954.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13224.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    416.40  DOWNSTREAM(FEET) =    410.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =   408.51   CHANNEL SLOPE =  0.0142
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.24
 CHANNEL FLOW THRU SUBAREA(CFS) =    2695.42
 FLOW VELOCITY(FEET/SEC.) =  10.14   FLOW DEPTH(FEET) =   4.24
 TRAVEL TIME(MIN.) =   0.67   Tc(MIN.) =   38.60
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2042.00   13.33    2.081  0.30( 0.25) 0.82    1175.2   30100.00
     2     2046.33   16.02    1.807  0.30( 0.25) 0.82    1420.2   30110.00
     3     2694.41   38.50    1.095  0.30( 0.25) 0.82    3471.1   13210.00
     4     2695.42   38.60    1.093  0.30( 0.25) 0.82    3480.5   13200.00
     5     2679.42   41.15    1.054  0.30( 0.25) 0.82    3642.5   13100.00
     6     2534.78   70.29    0.811  0.30( 0.24) 0.81    4935.4   13000.00
     7     2492.89   72.64    0.800  0.30( 0.24) 0.81    4954.1   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2695.42  Tc(MIN.) =   38.60
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    3480.48

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610302V.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
     1       22.90   10.61  0.30( 0.30) 1.00      11.9   30210.00
     2       22.67   10.93  0.30( 0.30) 1.00      12.0   30200.00
   TOTAL AREA(ACRES) =       12.0

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2042.00   13.33    2.081  0.30( 0.25) 0.82    1175.2   30100.00
     2     2046.33   16.02    1.807  0.30( 0.25) 0.82    1420.2   30110.00
     3     2694.41   38.50    1.095  0.30( 0.25) 0.82    3471.1   13210.00
     4     2695.42   38.60    1.093  0.30( 0.25) 0.82    3480.5   13200.00
     5     2679.42   41.15    1.054  0.30( 0.25) 0.82    3642.5   13100.00
```



```
     6     2534.78   70.29    0.811  0.30( 0.24) 0.81    4935.4   13000.00
     7     2492.89   72.64    0.800  0.30( 0.24) 0.81    4954.1   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       22.90   10.61    2.436  0.30( 0.30) 1.00      11.9   30210.00
     2       22.67   10.93    2.394  0.30( 0.30) 1.00      12.0   30200.00
 LONGEST FLOWPATH FROM NODE  30200.00 TO NODE  13224.00 =    1209.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1963.65   10.61    2.436  0.30( 0.25) 0.82     947.6   30210.00
     2     1983.51   10.93    2.394  0.30( 0.25) 0.82     975.6   30200.00
     3     2061.28   13.33    2.081  0.30( 0.25) 0.82    1187.2   30100.00
     4     2062.65   16.02    1.807  0.30( 0.25) 0.82    1432.2   30110.00
     5     2703.02   38.50    1.095  0.30( 0.25) 0.82    3483.1   13210.00
     6     2704.01   38.60    1.093  0.30( 0.25) 0.82    3492.5   13200.00
     7     2687.59   41.15    1.054  0.30( 0.25) 0.82    3654.6   13100.00
     8     2540.32   70.29    0.811  0.30( 0.24) 0.81    4947.4   13000.00
     9     2498.30   72.64    0.800  0.30( 0.24) 0.81    4966.1   13010.00
   TOTAL AREA(ACRES) =      4966.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     2704.01  Tc(MIN.) =   38.605
 EFFECTIVE AREA(ACRES) =   3492.51  AREA-AVERAGED Fm(INCH/HR) =  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
 TOTAL AREA(ACRES) =     4966.1
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13301.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    410.60  DOWNSTREAM(FEET) =    382.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.70   CHANNEL SLOPE =  0.0227
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.74
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.064
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       61.66      0.30      0.998     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2725.22
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.92
 AVERAGE FLOW DEPTH(FEET) =   3.74   TRAVEL TIME(MIN.) =   1.76
 Tc(MIN.) =   40.37
 SUBAREA AREA(ACRES) =    61.66       SUBAREA RUNOFF(CFS) =   42.42
 EFFECTIVE AREA(ACRES) =   3554.17     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
 TOTAL AREA(ACRES) =     5027.8         PEAK FLOW RATE(CFS) =    2704.01
```

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.72 FLOW VELOCITY(FEET/SEC.) = 11.88
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1963.65	12.56	2.181	0.30(0.25)	0.83	1009.3	30210.00
2	1983.51	12.87	2.140	0.30(0.25)	0.83	1037.3	30200.00
3	2061.28	15.25	1.849	0.30(0.25)	0.83	1248.9	30100.00
4	2062.65	17.94	1.704	0.30(0.25)	0.83	1493.9	30110.00
5	2703.02	40.26	1.065	0.30(0.25)	0.82	3544.8	13210.00
6	2704.01	40.37	1.064	0.30(0.25)	0.82	3554.2	13200.00
7	2687.59	42.92	1.034	0.30(0.25)	0.82	3716.2	13100.00
8	2540.32	72.09	0.802	0.30(0.24)	0.82	5009.1	13000.00
9	2498.30	74.45	0.791	0.30(0.24)	0.82	5027.8	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 2704.01 Tc(MIN.) = 40.37
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 3554.17

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610303V.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	184.19	21.52	0.30(0.30)	1.00	166.2	30300.00

TOTAL AREA(ACRES) = 166.2

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1963.65	12.56	2.181	0.30(0.25)	0.83	1009.3	30210.00
2	1983.51	12.87	2.140	0.30(0.25)	0.83	1037.3	30200.00
3	2061.28	15.25	1.849	0.30(0.25)	0.83	1248.9	30100.00
4	2062.65	17.94	1.704	0.30(0.25)	0.83	1493.9	30110.00
5	2703.02	40.26	1.065	0.30(0.25)	0.82	3544.8	13210.00
6	2704.01	40.37	1.064	0.30(0.25)	0.82	3554.2	13200.00
7	2687.59	42.92	1.034	0.30(0.25)	0.82	3716.2	13100.00
8	2540.32	72.09	0.802	0.30(0.24)	0.82	5009.1	13000.00
9	2498.30	74.45	0.791	0.30(0.24)	0.82	5027.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	184.19	21.52	1.531	0.30(0.30)	1.00	166.2	30300.00

LONGEST FLOWPATH FROM NODE 30300.00 TO NODE 13301.00 = 6391.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2127.85	12.56	2.181	0.30(0.25)	0.85	1106.3	30210.00
2	2148.14	12.87	2.140	0.30(0.25)	0.85	1136.7	30200.00
3	2225.39	15.25	1.849	0.30(0.25)	0.85	1366.7	30100.00
4	2237.66	17.94	1.704	0.30(0.25)	0.84	1632.4	30110.00
5	2349.65	21.52	1.531	0.30(0.25)	0.84	1989.3	30300.00
6	2817.43	40.26	1.065	0.30(0.25)	0.83	3711.0	13210.00
7	2818.23	40.37	1.064	0.30(0.25)	0.83	3720.4	13200.00
8	2797.31	42.92	1.034	0.30(0.25)	0.83	3882.4	13100.00
9	2615.46	72.09	0.802	0.30(0.25)	0.82	5175.3	13000.00
10	2571.70	74.45	0.791	0.30(0.25)	0.82	5194.0	13010.00

TOTAL AREA(ACRES) = 5194.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 2818.23 Tc(MIN.) = 40.368
EFFECTIVE AREA(ACRES) = 3720.39 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5194.0
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 382.00 DOWNSTREAM(FEET) = 375.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1141.09 CHANNEL SLOPE = 0.0061
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.50
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.035
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.42	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2821.35
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.71
AVERAGE FLOW DEPTH(FEET) = 5.50 TRAVEL TIME(MIN.) = 2.47
Tc(MIN.) = 42.84
SUBAREA AREA(ACRES) = 9.42 SUBAREA RUNOFF(CFS) = 6.23
EFFECTIVE AREA(ACRES) = 3729.81 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5203.4 PEAK FLOW RATE(CFS) = 2818.23
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.50

```
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.50   FLOW VELOCITY(FEET/SEC.) =   7.71
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.79 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2127.85   15.25    1.848  0.30( 0.25) 0.85    1115.7   30210.00
     2     2148.14   15.55    1.832  0.30( 0.25) 0.85    1146.1   30200.00
     3     2225.39   17.90    1.706  0.30( 0.25) 0.85    1376.1   30100.00
     4     2237.66   20.59    1.569  0.30( 0.25) 0.84    1641.8   30110.00
     5     2349.65   24.13    1.426  0.30( 0.25) 0.84    1998.8   30300.00
     6     2817.43   42.72    1.036  0.30( 0.25) 0.83    3720.4   13210.00
     7     2818.23   42.84    1.035  0.30( 0.25) 0.83    3729.8   13200.00
     8     2797.31   45.39    1.004  0.30( 0.25) 0.83    3891.9   13100.00
     9     2615.46   74.61    0.790  0.30( 0.25) 0.82    5184.7   13000.00
    10     2571.70   76.99    0.778  0.30( 0.25) 0.82    5203.4   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2818.23  Tc(MIN.) =   42.84
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =    3729.81

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13302.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610214V.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      222.15   25.23  0.30( 0.30) 1.00     227.7   21400.00
   TOTAL AREA(ACRES) =      227.7

****************************************************************************
 FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2127.85   15.25    1.848  0.30( 0.25) 0.85    1115.7   30210.00
     2     2148.14   15.55    1.832  0.30( 0.25) 0.85    1146.1   30200.00
     3     2225.39   17.90    1.706  0.30( 0.25) 0.85    1376.1   30100.00
     4     2237.66   20.59    1.569  0.30( 0.25) 0.84    1641.8   30110.00
     5     2349.65   24.13    1.426  0.30( 0.25) 0.84    1998.8   30300.00
     6     2817.43   42.72    1.036  0.30( 0.25) 0.83    3720.4   13210.00
     7     2818.23   42.84    1.035  0.30( 0.25) 0.83    3729.8   13200.00
     8     2797.31   45.39    1.004  0.30( 0.25) 0.83    3891.9   13100.00
```



```
     9     2615.46   74.61    0.790  0.30( 0.25) 0.82    5184.7   13000.00
    10     2571.70   76.99    0.778  0.30( 0.25) 0.82    5203.4   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.79 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      222.15   25.23    1.385  0.30( 0.30) 1.00     227.7   21400.00
 LONGEST FLOWPATH FROM NODE  21400.00 TO NODE  13302.00 =    6708.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2319.59   15.25    1.848  0.30( 0.26) 0.87    1253.4   30210.00
     2     2341.62   15.55    1.832  0.30( 0.26) 0.87    1286.5   30200.00
     3     2429.73   17.90    1.706  0.30( 0.26) 0.86    1537.7   30100.00
     4     2449.82   20.59    1.569  0.30( 0.26) 0.86    1827.6   30110.00
     5     2570.28   24.13    1.426  0.30( 0.26) 0.86    2216.5   30300.00
     6     2599.36   25.23    1.385  0.30( 0.26) 0.86    2327.9   21400.00
     7     2968.18   42.72    1.036  0.30( 0.25) 0.84    3948.1   13210.00
     8     2968.71   42.84    1.035  0.30( 0.25) 0.84    3957.5   13200.00
     9     2941.60   45.39    1.004  0.30( 0.25) 0.84    4119.5   13100.00
    10     2715.84   74.61    0.790  0.30( 0.25) 0.83    5412.4   13000.00
    11     2669.68   76.99    0.778  0.30( 0.25) 0.83    5431.1   13010.00
   TOTAL AREA(ACRES) =      5431.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     2968.71  Tc(MIN.) =   42.835
 EFFECTIVE AREA(ACRES) =   3957.46  AREA-AVERAGED Fm(INCH/HR) =  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
 TOTAL AREA(ACRES) =     5431.1
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.79 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13302.00 TO NODE  13303.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    375.00  DOWNSTREAM(FEET) =    355.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2193.96   CHANNEL SLOPE =  0.0091
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.07
 CHANNEL FLOW THRU SUBAREA(CFS) =    2968.71
 FLOW VELOCITY(FEET/SEC.) =   8.98   FLOW DEPTH(FEET) =   5.07
 TRAVEL TIME(MIN.) =   4.07   Tc(MIN.) =   46.91
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2319.59   19.65    1.612  0.30( 0.26) 0.87    1253.4   30210.00
     2     2341.62   19.94    1.596  0.30( 0.26) 0.87    1286.5   30200.00
     3     2429.73   22.24    1.502  0.30( 0.26) 0.86    1537.7   30100.00
     4     2449.82   24.91    1.395  0.30( 0.26) 0.86    1827.6   30110.00
     5     2570.28   28.40    1.295  0.30( 0.26) 0.86    2216.5   30300.00
     6     2599.36   29.47    1.265  0.30( 0.26) 0.86    2327.9   21400.00
```

```
      7     2968.18   46.80    0.988  0.30( 0.25) 0.84    3948.1   13210.00
      8     2968.71   46.91    0.987  0.30( 0.25) 0.84    3957.5   13200.00
      9     2941.60   49.48    0.956  0.30( 0.25) 0.84    4119.5   13100.00
     10     2715.84   78.80    0.769  0.30( 0.25) 0.83    5412.4   13000.00
     11     2669.68   81.20    0.757  0.30( 0.25) 0.83    5431.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2968.71  Tc(MIN.) =   46.91
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =    3957.46

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610213V.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      133.35   16.00  0.30( 0.30) 1.00      98.2   21300.00
    TOTAL AREA(ACRES) =       98.2

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2319.59   19.65    1.612  0.30( 0.26) 0.87    1253.4   30210.00
      2     2341.62   19.94    1.596  0.30( 0.26) 0.87    1286.5   30200.00
      3     2429.73   22.24    1.502  0.30( 0.26) 0.86    1537.7   30100.00
      4     2449.82   24.91    1.395  0.30( 0.26) 0.86    1827.6   30110.00
      5     2570.28   28.40    1.295  0.30( 0.26) 0.86    2216.5   30300.00
      6     2599.36   29.47    1.265  0.30( 0.26) 0.86    2327.9   21400.00
      7     2968.18   46.80    0.988  0.30( 0.25) 0.84    3948.1   13210.00
      8     2968.71   46.91    0.987  0.30( 0.25) 0.84    3957.5   13200.00
      9     2941.60   49.48    0.956  0.30( 0.25) 0.84    4119.5   13100.00
     10     2715.84   78.80    0.769  0.30( 0.25) 0.83    5412.4   13000.00
     11     2669.68   81.20    0.757  0.30( 0.25) 0.83    5431.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      133.35   16.00    1.808  0.30( 0.30) 1.00      98.2   21300.00
  LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  13303.00 =    2988.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2296.32   16.00    1.808  0.30( 0.26) 0.88    1118.6   21300.00
      2     2435.56   19.65    1.612  0.30( 0.26) 0.88    1351.6   30210.00
      3     2456.22   19.94    1.596  0.30( 0.26) 0.87    1384.7   30200.00
      4     2536.03   22.24    1.502  0.30( 0.26) 0.87    1635.9   30100.00
      5     2546.59   24.91    1.395  0.30( 0.26) 0.87    1925.8   30110.00
      6     2658.27   28.40    1.295  0.30( 0.26) 0.86    2314.7   30300.00
      7     2684.68   29.47    1.265  0.30( 0.26) 0.86    2426.1   21400.00
      8     3029.00   46.80    0.988  0.30( 0.25) 0.84    4046.3   13210.00
      9     3029.41   46.91    0.987  0.30( 0.25) 0.84    4055.7   13200.00
     10     2999.62   49.48    0.956  0.30( 0.25) 0.84    4217.7   13100.00
     11     2757.34   78.80    0.769  0.30( 0.25) 0.83    5510.6   13000.00
     12     2710.12   81.20    0.757  0.30( 0.25) 0.83    5529.3   13010.00
    TOTAL AREA(ACRES) =      5529.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3029.41  Tc(MIN.) =   46.906
  EFFECTIVE AREA(ACRES) =   4055.68  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5529.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13304.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    355.00  DOWNSTREAM(FEET) =    350.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.40   CHANNEL SLOPE =  0.0054
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.962
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3033.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.54
  AVERAGE FLOW DEPTH(FEET) =   5.93   TRAVEL TIME(MIN.) =   2.04
  Tc(MIN.) =   48.95
  SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =    8.25
  EFFECTIVE AREA(ACRES) =   4069.52     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     5543.1         PEAK FLOW RATE(CFS) =    3029.41
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.93   FLOW VELOCITY(FEET/SEC.) =   7.54
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2296.32	18.23	1.688	0.30(0.26)	0.88	1132.4	21300.00
2	2435.56	21.84	1.519	0.30(0.26)	0.88	1365.4	30210.00
3	2456.22	22.12	1.507	0.30(0.26)	0.88	1398.5	30200.00
4	2536.03	24.40	1.415	0.30(0.26)	0.87	1649.7	30100.00
5	2546.59	27.07	1.333	0.30(0.26)	0.87	1939.7	30110.00
6	2658.27	30.52	1.240	0.30(0.26)	0.86	2328.6	30300.00
7	2684.68	31.59	1.221	0.30(0.26)	0.86	2439.9	21400.00
8	3029.00	48.84	0.964	0.30(0.25)	0.84	4060.2	13210.00
9	3029.41	48.95	0.962	0.30(0.25)	0.84	4069.5	13200.00
10	2999.62	51.53	0.937	0.30(0.25)	0.84	4231.6	13100.00
11	2757.34	80.90	0.759	0.30(0.25)	0.83	5524.5	13000.00
12	2710.12	83.32	0.747	0.30(0.25)	0.83	5543.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 3029.41 Tc(MIN.) = 48.95
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 4069.52

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610304V.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	195.33	19.44	0.30(0.30)	1.00	164.1	30410.00
2	181.67	24.65	0.30(0.30)	1.00	182.7	30400.00

TOTAL AREA(ACRES) = 182.7

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2296.32	18.23	1.688	0.30(0.26)	0.88	1132.4	21300.00
2	2435.56	21.84	1.519	0.30(0.26)	0.88	1365.4	30210.00
3	2456.22	22.12	1.507	0.30(0.26)	0.88	1398.5	30200.00
4	2536.03	24.40	1.415	0.30(0.26)	0.87	1649.7	30100.00
5	2546.59	27.07	1.333	0.30(0.26)	0.87	1939.7	30110.00
6	2658.27	30.52	1.240	0.30(0.26)	0.86	2328.6	30300.00
7	2684.68	31.59	1.221	0.30(0.26)	0.86	2439.9	21400.00
8	3029.00	48.84	0.964	0.30(0.25)	0.84	4060.2	13210.00
9	3029.41	48.95	0.962	0.30(0.25)	0.84	4069.5	13200.00
10	2999.62	51.53	0.937	0.30(0.25)	0.84	4231.6	13100.00
11	2757.34	80.90	0.759	0.30(0.25)	0.83	5524.5	13000.00

12	2710.12	83.32	0.747	0.30(0.25)	0.83	5543.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	195.33	19.44	1.623	0.30(0.30)	1.00	164.1	30410.00
2	181.67	24.65	1.405	0.30(0.30)	1.00	182.7	30400.00

LONGEST FLOWPATH FROM NODE 30400.00 TO NODE 13304.00 = 5899.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2488.48	18.23	1.688	0.30(0.27)	0.89	1286.2	21300.00
2	2538.62	19.44	1.623	0.30(0.27)	0.89	1375.1	30410.00
3	2624.60	21.84	1.519	0.30(0.27)	0.89	1538.1	30210.00
4	2644.52	22.12	1.507	0.30(0.27)	0.89	1572.2	30200.00
5	2718.35	24.40	1.415	0.30(0.27)	0.88	1831.6	30100.00
6	2718.67	24.65	1.405	0.30(0.27)	0.88	1858.9	30400.00
7	2716.33	27.07	1.333	0.30(0.26)	0.88	2122.4	30110.00
8	2812.85	30.52	1.240	0.30(0.26)	0.87	2511.3	30300.00
9	2836.07	31.59	1.221	0.30(0.26)	0.87	2622.6	21400.00
10	3138.09	48.84	0.964	0.30(0.26)	0.85	4242.9	13210.00
11	3138.29	48.95	0.962	0.30(0.26)	0.85	4252.2	13200.00
12	3104.25	51.53	0.937	0.30(0.25)	0.85	4414.3	13100.00
13	2832.76	80.90	0.759	0.30(0.25)	0.84	5707.2	13000.00
14	2783.59	83.32	0.747	0.30(0.25)	0.84	5725.8	13010.00

TOTAL AREA(ACRES) = 5725.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3138.29 Tc(MIN.) = 48.950
EFFECTIVE AREA(ACRES) = 4252.23 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87
TOTAL AREA(ACRES) = 5725.8
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13305.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 350.00 DOWNSTREAM(FEET) = 315.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.27 CHANNEL SLOPE = 0.0118
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.87
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.916
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3145.88
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.99
AVERAGE FLOW DEPTH(FEET) = 4.87 TRAVEL TIME(MIN.) = 4.95
Tc(MIN.) = 53.90

SUBAREA AREA(ACRES) = 27.39 SUBAREA RUNOFF(CFS) = 15.18
EFFECTIVE AREA(ACRES) = 4279.62 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 5753.2 PEAK FLOW RATE(CFS) = 3138.29
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.86 FLOW VELOCITY(FEET/SEC.) = 9.99
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2488.48	23.55	1.450	0.30(0.27)	0.90	1313.6	21300.00
2	2538.62	24.73	1.402	0.30(0.27)	0.89	1402.5	30410.00
3	2624.60	27.07	1.333	0.30(0.27)	0.89	1565.5	30210.00
4	2644.52	27.34	1.325	0.30(0.27)	0.89	1599.6	30200.00
5	2718.35	29.57	1.262	0.30(0.27)	0.89	1858.9	30100.00
6	2718.67	29.82	1.255	0.30(0.27)	0.89	1886.3	30400.00
7	2716.33	32.25	1.209	0.30(0.26)	0.88	2149.8	30110.00
8	2812.85	35.65	1.147	0.30(0.26)	0.88	2538.7	30300.00
9	2836.07	36.70	1.128	0.30(0.26)	0.87	2650.0	21400.00
10	3138.09	53.79	0.917	0.30(0.26)	0.85	4270.3	13210.00
11	3138.29	53.90	0.916	0.30(0.26)	0.85	4279.6	13200.00
12	3104.25	56.49	0.893	0.30(0.25)	0.85	4441.7	13100.00
13	2832.76	86.01	0.734	0.30(0.25)	0.84	5734.6	13000.00
14	2783.59	88.45	0.722	0.30(0.25)	0.84	5753.2	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 3138.29 Tc(MIN.) = 53.90
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.85 EFFECTIVE AREA(ACRES) = 4279.62

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610305V.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	558.58	23.57	0.30(0.30)	1.00	540.5	30520.00
2	553.09	25.07	0.30(0.30)	1.00	564.6	30540.00
3	542.93	26.52	0.30(0.30)	1.00	575.8	30510.00
4	526.27	28.10	0.30(0.30)	1.00	582.8	30500.00

TOTAL AREA(ACRES) = 582.8

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2488.48	23.55	1.450	0.30(0.27)	0.90	1313.6	21300.00
2	2538.62	24.73	1.402	0.30(0.27)	0.89	1402.5	30410.00
3	2624.60	27.07	1.333	0.30(0.27)	0.89	1565.5	30210.00
4	2644.52	27.34	1.325	0.30(0.27)	0.89	1599.6	30200.00
5	2718.35	29.57	1.262	0.30(0.27)	0.89	1858.9	30100.00
6	2718.67	29.82	1.255	0.30(0.27)	0.89	1886.3	30400.00
7	2716.33	32.25	1.209	0.30(0.26)	0.88	2149.8	30110.00
8	2812.85	35.65	1.147	0.30(0.26)	0.88	2538.7	30300.00
9	2836.07	36.70	1.128	0.30(0.26)	0.87	2650.0	21400.00
10	3138.09	53.79	0.917	0.30(0.26)	0.85	4270.3	13210.00
11	3138.29	53.90	0.916	0.30(0.26)	0.85	4279.6	13200.00
12	3104.25	56.49	0.893	0.30(0.25)	0.85	4441.7	13100.00
13	2832.76	86.01	0.734	0.30(0.25)	0.84	5734.6	13000.00
14	2783.59	88.45	0.722	0.30(0.25)	0.84	5753.2	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	558.58	23.57	1.449	0.30(0.30)	1.00	540.5	30520.00
2	553.09	25.07	1.389	0.30(0.30)	1.00	564.6	30540.00
3	542.93	26.52	1.348	0.30(0.30)	1.00	575.8	30510.00
4	526.27	28.10	1.304	0.30(0.30)	1.00	582.8	30500.00

LONGEST FLOWPATH FROM NODE 30500.00 TO NODE 13305.00 = 9458.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3046.96	23.55	1.450	0.30(0.28)	0.93	1853.5	21300.00
2	3048.09	23.57	1.449	0.30(0.28)	0.93	1855.9	30520.00
3	3092.96	24.73	1.402	0.30(0.28)	0.92	1961.6	30410.00
4	3104.31	25.07	1.389	0.30(0.28)	0.92	1991.0	30540.00
5	3147.31	26.52	1.348	0.30(0.28)	0.92	2102.9	30510.00
6	3161.72	27.07	1.333	0.30(0.28)	0.92	2143.7	30210.00
7	3178.87	27.34	1.325	0.30(0.28)	0.92	2179.0	30200.00
8	3196.06	28.10	1.304	0.30(0.28)	0.92	2271.2	30500.00
9	3222.84	29.57	1.262	0.30(0.27)	0.91	2441.8	30100.00
10	3219.58	29.82	1.255	0.30(0.27)	0.91	2469.1	30400.00
11	3193.10	32.25	1.209	0.30(0.27)	0.91	2732.6	30110.00
12	3257.18	35.65	1.147	0.30(0.27)	0.90	3121.5	30300.00
13	3270.36	36.70	1.128	0.30(0.27)	0.90	3232.9	21400.00
14	3461.50	53.79	0.917	0.30(0.26)	0.87	4853.1	13210.00
15	3461.19	53.90	0.916	0.30(0.26)	0.87	4862.5	13200.00
16	3415.18	56.49	0.893	0.30(0.26)	0.87	5024.5	13100.00
17	3060.21	86.01	0.734	0.30(0.26)	0.85	6317.4	13000.00
18	3004.73	88.45	0.722	0.30(0.26)	0.85	6336.1	13010.00

TOTAL AREA(ACRES) = 6336.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3461.50 Tc(MIN.) = 53.788
EFFECTIVE AREA(ACRES) = 4853.10 AREA-AVERAGED Fm(INCH/HR) = 0.26

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.91
TOTAL AREA(ACRES) = 6336.1
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.20 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 315.00 DOWNSTREAM(FEET) = 284.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1317.91 CHANNEL SLOPE = 0.0235
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.24
CHANNEL FLOW THRU SUBAREA(CFS) = 3461.50
FLOW VELOCITY(FEET/SEC.) = 13.03 FLOW DEPTH(FEET) = 4.24
TRAVEL TIME(MIN.) = 1.69 Tc(MIN.) = 55.47
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3046.96	25.30	1.382	0.30(0.28)	0.93	1853.5	21300.00
2	3048.09	25.33	1.382	0.30(0.28)	0.93	1855.9	30520.00
3	3092.96	26.48	1.349	0.30(0.28)	0.92	1961.6	30410.00
4	3104.31	26.82	1.340	0.30(0.28)	0.92	1991.0	30540.00
5	3147.31	28.26	1.299	0.30(0.28)	0.92	2102.9	30510.00
6	3161.72	28.81	1.284	0.30(0.28)	0.92	2143.7	30210.00
7	3178.87	29.07	1.276	0.30(0.28)	0.92	2179.0	30200.00
8	3196.06	29.83	1.255	0.30(0.28)	0.92	2271.2	30500.00
9	3222.84	31.30	1.226	0.30(0.27)	0.91	2441.8	30100.00
10	3219.58	31.54	1.222	0.30(0.27)	0.91	2469.1	30400.00
11	3193.10	33.98	1.178	0.30(0.27)	0.91	2732.6	30110.00
12	3257.18	37.36	1.116	0.30(0.27)	0.90	3121.5	30300.00
13	3270.36	38.41	1.097	0.30(0.27)	0.90	3232.9	21400.00
14	3461.50	55.47	0.902	0.30(0.26)	0.87	4853.1	13210.00
15	3461.19	55.58	0.901	0.30(0.26)	0.87	4862.5	13200.00
16	3415.18	58.18	0.878	0.30(0.26)	0.87	5024.5	13100.00
17	3060.21	87.77	0.725	0.30(0.26)	0.85	6317.4	13000.00
18	3004.73	90.22	0.713	0.30(0.26)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 3461.50 Tc(MIN.) = 55.47
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 4853.10

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: 0610306V.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	48.81	19.05	0.30(0.30)	1.00	40.4	30600.00

TOTAL AREA(ACRES) = 40.4

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3046.96	25.30	1.382	0.30(0.28)	0.93	1853.5	21300.00
2	3048.09	25.33	1.382	0.30(0.28)	0.93	1855.9	30520.00
3	3092.96	26.48	1.349	0.30(0.28)	0.92	1961.6	30410.00
4	3104.31	26.82	1.340	0.30(0.28)	0.92	1991.0	30540.00
5	3147.31	28.26	1.299	0.30(0.28)	0.92	2102.9	30510.00
6	3161.72	28.81	1.284	0.30(0.28)	0.92	2143.7	30210.00
7	3178.87	29.07	1.276	0.30(0.28)	0.92	2179.0	30200.00
8	3196.06	29.83	1.255	0.30(0.28)	0.92	2271.2	30500.00
9	3222.84	31.30	1.226	0.30(0.27)	0.91	2441.8	30100.00
10	3219.58	31.54	1.222	0.30(0.27)	0.91	2469.1	30400.00
11	3193.10	33.98	1.178	0.30(0.27)	0.91	2732.6	30110.00
12	3257.18	37.36	1.116	0.30(0.27)	0.90	3121.5	30300.00
13	3270.36	38.41	1.097	0.30(0.27)	0.90	3232.9	21400.00
14	3461.50	55.47	0.902	0.30(0.26)	0.87	4853.1	13210.00
15	3461.19	55.58	0.901	0.30(0.26)	0.87	4862.5	13200.00
16	3415.18	58.18	0.878	0.30(0.26)	0.87	5024.5	13100.00
17	3060.21	87.77	0.725	0.30(0.26)	0.85	6317.4	13000.00
18	3004.73	90.22	0.713	0.30(0.26)	0.85	6336.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	48.81	19.05	1.644	0.30(0.30)	1.00	40.4	30600.00

LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 = 2948.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2886.22	19.05	1.644	0.30(0.28)	0.93	1436.0	30600.00
2	3086.28	25.30	1.382	0.30(0.28)	0.93	1893.8	21300.00
3	3087.37	25.33	1.382	0.30(0.28)	0.93	1896.2	30520.00
4	3131.07	26.48	1.349	0.30(0.28)	0.93	2001.9	30410.00
5	3142.07	26.82	1.340	0.30(0.28)	0.93	2031.3	30540.00
6	3183.59	28.26	1.299	0.30(0.28)	0.92	2143.3	30510.00
7	3197.44	28.81	1.284	0.30(0.28)	0.92	2184.1	30210.00
8	3214.32	29.07	1.276	0.30(0.28)	0.92	2219.4	30200.00
9	3230.73	29.83	1.255	0.30(0.28)	0.92	2311.5	30500.00
10	3256.49	31.30	1.226	0.30(0.27)	0.91	2482.1	30100.00
11	3253.06	31.54	1.222	0.30(0.27)	0.91	2509.4	30400.00
12	3224.98	33.98	1.178	0.30(0.27)	0.91	2773.0	30110.00
13	3286.81	37.36	1.116	0.30(0.27)	0.90	3161.9	30300.00
14	3299.30	38.41	1.097	0.30(0.27)	0.90	3273.2	21400.00

15	3483.36	55.47	0.902	0.30(0.26)	0.87	4893.4	13210.00
16	3483.01	55.58	0.901	0.30(0.26)	0.87	4902.8	13200.00
17	3436.17	58.18	0.878	0.30(0.26)	0.87	5064.9	13100.00
18	3075.65	87.77	0.725	0.30(0.26)	0.86	6357.7	13000.00
19	3019.74	90.22	0.713	0.30(0.26)	0.85	6376.4	13010.00

TOTAL AREA(ACRES) = 6376.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3483.36 Tc(MIN.) = 55.474
EFFECTIVE AREA(ACRES) = 4893.45 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90
TOTAL AREA(ACRES) = 6376.4
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.40 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 284.00 DOWNSTREAM(FEET) = 274.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 826.37 CHANNEL SLOPE = 0.0121
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.12
CHANNEL FLOW THRU SUBAREA(CFS) = 3483.36
FLOW VELOCITY(FEET/SEC.) = 10.40 FLOW DEPTH(FEET) = 5.12
TRAVEL TIME(MIN.) = 1.32 Tc(MIN.) = 56.80
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2886.22	20.46	1.575	0.30(0.28)	0.93	1436.0	30600.00
2	3086.28	26.68	1.344	0.30(0.28)	0.93	1893.8	21300.00
3	3087.37	26.70	1.343	0.30(0.28)	0.93	1896.2	30520.00
4	3131.07	27.84	1.311	0.30(0.28)	0.93	2001.9	30410.00
5	3142.07	28.19	1.301	0.30(0.28)	0.93	2031.3	30540.00
6	3183.59	29.62	1.261	0.30(0.28)	0.92	2143.3	30510.00
7	3197.44	30.17	1.247	0.30(0.28)	0.92	2184.1	30210.00
8	3214.32	30.43	1.242	0.30(0.28)	0.92	2219.4	30200.00
9	3230.73	31.19	1.228	0.30(0.28)	0.92	2311.5	30500.00
10	3256.49	32.65	1.202	0.30(0.27)	0.91	2482.1	30100.00
11	3253.06	32.89	1.197	0.30(0.27)	0.91	2509.4	30400.00
12	3224.98	35.33	1.153	0.30(0.27)	0.91	2773.0	30110.00
13	3286.81	38.71	1.091	0.30(0.27)	0.90	3161.9	30300.00
14	3299.30	39.76	1.072	0.30(0.27)	0.90	3273.2	21400.00
15	3483.36	56.80	0.890	0.30(0.26)	0.87	4893.4	13210.00
16	3483.01	56.91	0.889	0.30(0.26)	0.87	4902.8	13200.00
17	3436.17	59.51	0.866	0.30(0.26)	0.87	5064.9	13100.00
18	3075.65	89.14	0.718	0.30(0.26)	0.86	6357.7	13000.00
19	3019.74	91.60	0.709	0.30(0.26)	0.85	6376.4	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 3483.36 Tc(MIN.) = 56.80
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 4893.45

****

FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610307V.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	120.43	18.66	0.30(0.30)	1.00	98.0	30700.00

TOTAL AREA(ACRES) = 98.0

****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2886.22	20.46	1.575	0.30(0.28)	0.93	1436.0	30600.00
2	3086.28	26.68	1.344	0.30(0.28)	0.93	1893.8	21300.00
3	3087.37	26.70	1.343	0.30(0.28)	0.93	1896.2	30520.00
4	3131.07	27.84	1.311	0.30(0.28)	0.93	2001.9	30410.00
5	3142.07	28.19	1.301	0.30(0.28)	0.93	2031.3	30540.00
6	3183.59	29.62	1.261	0.30(0.28)	0.92	2143.3	30510.00
7	3197.44	30.17	1.247	0.30(0.28)	0.92	2184.1	30210.00
8	3214.32	30.43	1.242	0.30(0.28)	0.92	2219.4	30200.00
9	3230.73	31.19	1.228	0.30(0.28)	0.92	2311.5	30500.00
10	3256.49	32.65	1.202	0.30(0.27)	0.91	2482.1	30100.00
11	3253.06	32.89	1.197	0.30(0.27)	0.91	2509.4	30400.00
12	3224.98	35.33	1.153	0.30(0.27)	0.91	2773.0	30110.00
13	3286.81	38.71	1.091	0.30(0.27)	0.90	3161.9	30300.00
14	3299.30	39.76	1.072	0.30(0.27)	0.90	3273.2	21400.00
15	3483.36	56.80	0.890	0.30(0.26)	0.87	4893.4	13210.00
16	3483.01	56.91	0.889	0.30(0.26)	0.87	4902.8	13200.00
17	3436.17	59.51	0.866	0.30(0.26)	0.87	5064.9	13100.00
18	3075.65	89.14	0.718	0.30(0.26)	0.86	6357.7	13000.00
19	3019.74	91.60	0.709	0.30(0.26)	0.85	6376.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	120.43	18.66	1.665	0.30(0.30)	1.00	98.0	30700.00

LONGEST FLOWPATH FROM NODE 30700.00 TO NODE 13305.40 = 5192.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2936.87	18.66	1.665	0.30(0.28)	0.93	1407.6	30700.00
2	2998.64	20.46	1.575	0.30(0.28)	0.93	1534.0	30600.00

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      3     3178.34   26.68    1.344  0.30( 0.28) 0.93    1991.8   21300.00
      4     3179.38   26.70    1.343  0.30( 0.28) 0.93    1994.2   30520.00
      5     3220.24   27.84    1.311  0.30( 0.28) 0.93    2099.9   30410.00
      6     3230.38   28.19    1.301  0.30( 0.28) 0.93    2129.3   30540.00
      7     3268.32   29.62    1.261  0.30( 0.28) 0.93    2241.3   30510.00
      8     3280.97   30.17    1.247  0.30( 0.28) 0.93    2282.1   30210.00
      9     3297.43   30.43    1.242  0.30( 0.28) 0.93    2317.4   30200.00
     10     3312.62   31.19    1.228  0.30( 0.28) 0.92    2409.5   30500.00
     11     3336.03   32.65    1.202  0.30( 0.28) 0.92    2580.1   30100.00
     12     3332.21   32.89    1.197  0.30( 0.28) 0.92    2607.4   30400.00
     13     3300.22   35.33    1.153  0.30( 0.27) 0.91    2871.0   30110.00
     14     3356.63   38.71    1.091  0.30( 0.27) 0.90    3259.9   30300.00
     15     3367.44   39.76    1.072  0.30( 0.27) 0.90    3371.2   21400.00
     16     3535.42   56.80    0.890  0.30( 0.26) 0.87    4991.4   13210.00
     17     3534.99   56.91    0.889  0.30( 0.26) 0.87    5000.8   13200.00
     18     3486.12   59.51    0.866  0.30( 0.26) 0.87    5162.9   13100.00
     19     3112.54   89.14    0.718  0.30( 0.26) 0.86    6455.8   13000.00
     20     3055.86   91.60    0.709  0.30( 0.26) 0.86    6474.4   13010.00
   TOTAL AREA(ACRES) =      6474.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3535.42  Tc(MIN.) =   56.798
  EFFECTIVE AREA(ACRES) =   4991.45  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.90
  TOTAL AREA(ACRES) =     6474.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.60 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    274.00  DOWNSTREAM(FEET) =    258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   733.85   CHANNEL SLOPE =  0.0218
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.38
  CHANNEL FLOW THRU SUBAREA(CFS) =    3535.42
  FLOW VELOCITY(FEET/SEC.) =  12.80   FLOW DEPTH(FEET) =   4.38
  TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =   57.75
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2936.87   19.67    1.611  0.30( 0.28) 0.93    1407.6   30700.00
      2     2998.64   21.47    1.534  0.30( 0.28) 0.93    1534.0   30600.00
      3     3178.34   27.67    1.316  0.30( 0.28) 0.93    1991.8   21300.00
      4     3179.38   27.69    1.315  0.30( 0.28) 0.93    1994.2   30520.00
      5     3220.24   28.83    1.283  0.30( 0.28) 0.93    2099.9   30410.00
      6     3230.38   29.17    1.273  0.30( 0.28) 0.93    2129.3   30540.00
      7     3268.32   30.60    1.239  0.30( 0.28) 0.93    2241.3   30510.00
      8     3280.97   31.15    1.229  0.30( 0.28) 0.93    2282.1   30210.00
      9     3297.43   31.40    1.224  0.30( 0.28) 0.93    2317.4   30200.00
     10     3312.62   32.16    1.211  0.30( 0.28) 0.92    2409.5   30500.00
     11     3336.03   33.63    1.184  0.30( 0.28) 0.92    2580.1   30100.00
     12     3332.21   33.87    1.180  0.30( 0.28) 0.92    2607.4   30400.00
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     13     3300.22   36.31    1.135  0.30( 0.27) 0.91    2871.0   30110.00
     14     3356.63   39.68    1.074  0.30( 0.27) 0.90    3259.9   30300.00
     15     3367.44   40.73    1.059  0.30( 0.27) 0.90    3371.2   21400.00
     16     3535.42   57.75    0.882  0.30( 0.26) 0.87    4991.4   13210.00
     17     3534.99   57.86    0.881  0.30( 0.26) 0.87    5000.8   13200.00
     18     3486.12   60.47    0.860  0.30( 0.26) 0.87    5162.9   13100.00
     19     3112.54   90.14    0.714  0.30( 0.26) 0.86    6455.8   13000.00
     20     3055.86   92.60    0.707  0.30( 0.26) 0.86    6474.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3535.42  Tc(MIN.) =   57.75
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    4991.45

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.60 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.60 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610308V.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       81.78   17.98  0.30( 0.30) 1.00      64.8   30800.00
    TOTAL AREA(ACRES) =       64.8

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.60 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2936.87   19.67    1.611  0.30( 0.28) 0.93    1407.6   30700.00
      2     2998.64   21.47    1.534  0.30( 0.28) 0.93    1534.0   30600.00
      3     3178.34   27.67    1.316  0.30( 0.28) 0.93    1991.8   21300.00
      4     3179.38   27.69    1.315  0.30( 0.28) 0.93    1994.2   30520.00
      5     3220.24   28.83    1.283  0.30( 0.28) 0.93    2099.9   30410.00
      6     3230.38   29.17    1.273  0.30( 0.28) 0.93    2129.3   30540.00
      7     3268.32   30.60    1.239  0.30( 0.28) 0.93    2241.3   30510.00
      8     3280.97   31.15    1.229  0.30( 0.28) 0.93    2282.1   30210.00
      9     3297.43   31.40    1.224  0.30( 0.28) 0.93    2317.4   30200.00
     10     3312.62   32.16    1.211  0.30( 0.28) 0.92    2409.5   30500.00
     11     3336.03   33.63    1.184  0.30( 0.28) 0.92    2580.1   30100.00
     12     3332.21   33.87    1.180  0.30( 0.28) 0.92    2607.4   30400.00
     13     3300.22   36.31    1.135  0.30( 0.27) 0.91    2871.0   30110.00
     14     3356.63   39.68    1.074  0.30( 0.27) 0.90    3259.9   30300.00
     15     3367.44   40.73    1.059  0.30( 0.27) 0.90    3371.2   21400.00
     16     3535.42   57.75    0.882  0.30( 0.26) 0.87    4991.4   13210.00
     17     3534.99   57.86    0.881  0.30( 0.26) 0.87    5000.8   13200.00
     18     3486.12   60.47    0.860  0.30( 0.26) 0.87    5162.9   13100.00
```

```
    19     3112.54   90.14    0.714  0.30( 0.26) 0.86    6455.8   13000.00
    20     3055.86   92.60    0.707  0.30( 0.26) 0.86    6474.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       81.78   17.98    1.702  0.30( 0.30) 1.00      64.8   30800.00
  LONGEST FLOWPATH FROM NODE  30800.00 TO NODE  13305.60 =    4165.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2949.77   17.98    1.702  0.30( 0.28) 0.94    1351.5   30800.00
      2     3013.35   19.67    1.611  0.30( 0.28) 0.94    1472.4   30700.00
      3     3070.62   21.47    1.534  0.30( 0.28) 0.94    1598.9   30600.00
      4     3237.61   27.67    1.316  0.30( 0.28) 0.93    2056.7   21300.00
      5     3238.61   27.69    1.315  0.30( 0.28) 0.93    2059.0   30520.00
      6     3277.59   28.83    1.283  0.30( 0.28) 0.93    2164.7   30410.00
      7     3287.17   29.17    1.273  0.30( 0.28) 0.93    2194.2   30540.00
      8     3323.11   30.60    1.239  0.30( 0.28) 0.93    2306.1   30510.00
      9     3335.18   31.15    1.229  0.30( 0.28) 0.93    2346.9   30210.00
     10     3351.37   31.40    1.224  0.30( 0.28) 0.93    2382.2   30200.00
     11     3365.76   32.16    1.211  0.30( 0.28) 0.92    2474.4   30500.00
     12     3387.61   33.63    1.184  0.30( 0.28) 0.92    2645.0   30100.00
     13     3383.54   33.87    1.180  0.30( 0.28) 0.92    2672.3   30400.00
     14     3348.95   36.31    1.135  0.30( 0.27) 0.91    2935.8   30110.00
     15     3401.77   39.68    1.074  0.30( 0.27) 0.91    3324.7   30300.00
     16     3411.75   40.73    1.059  0.30( 0.27) 0.90    3436.0   21400.00
     17     3569.37   57.75    0.882  0.30( 0.26) 0.87    5056.3   13210.00
     18     3568.88   57.86    0.881  0.30( 0.26) 0.87    5065.6   13200.00
     19     3518.78   60.47    0.860  0.30( 0.26) 0.87    5227.7   13100.00
     20     3136.68   90.14    0.714  0.30( 0.26) 0.86    6520.6   13000.00
     21     3079.59   92.60    0.707  0.30( 0.26) 0.86    6539.3   13010.00
    TOTAL AREA(ACRES) =      6539.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3569.37  Tc(MIN.) =   57.753
  EFFECTIVE AREA(ACRES) =   5056.27  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.90
  TOTAL AREA(ACRES) =     6539.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.80 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    254.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.16   CHANNEL SLOPE =  0.0042
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.93
  CHANNEL FLOW THRU SUBAREA(CFS) =    3569.37
  FLOW VELOCITY(FEET/SEC.) =   7.27   FLOW DEPTH(FEET) =   6.93
  TRAVEL TIME(MIN.) =   2.17   Tc(MIN.) =   59.92
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.80 =   45711.71 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2949.77   20.28    1.582  0.30( 0.28) 0.94    1351.5   30800.00
      2     3013.35   21.96    1.514  0.30( 0.28) 0.94    1472.4   30700.00
      3     3070.62   23.74    1.442  0.30( 0.28) 0.94    1598.9   30600.00
      4     3237.61   29.90    1.253  0.30( 0.28) 0.93    2056.7   21300.00
      5     3238.61   29.92    1.252  0.30( 0.28) 0.93    2059.0   30520.00
      6     3277.59   31.06    1.231  0.30( 0.28) 0.93    2164.7   30410.00
      7     3287.17   31.40    1.225  0.30( 0.28) 0.93    2194.2   30540.00
      8     3323.11   32.82    1.199  0.30( 0.28) 0.93    2306.1   30510.00
      9     3335.18   33.36    1.189  0.30( 0.28) 0.93    2346.9   30210.00
     10     3351.37   33.61    1.184  0.30( 0.28) 0.93    2382.2   30200.00
     11     3365.76   34.37    1.170  0.30( 0.28) 0.92    2474.4   30500.00
     12     3387.61   35.83    1.144  0.30( 0.28) 0.92    2645.0   30100.00
     13     3383.54   36.08    1.139  0.30( 0.28) 0.92    2672.3   30400.00
     14     3348.95   38.52    1.095  0.30( 0.27) 0.91    2935.8   30110.00
     15     3401.77   41.89    1.046  0.30( 0.27) 0.91    3324.7   30300.00
     16     3411.75   42.93    1.033  0.30( 0.27) 0.90    3436.0   21400.00
     17     3569.37   59.92    0.863  0.30( 0.26) 0.87    5056.3   13210.00
     18     3568.88   60.03    0.862  0.30( 0.26) 0.87    5065.6   13200.00
     19     3518.78   62.65    0.849  0.30( 0.26) 0.87    5227.7   13100.00
     20     3136.68   92.39    0.707  0.30( 0.26) 0.86    6520.6   13000.00
     21     3079.59   94.87    0.700  0.30( 0.26) 0.86    6539.3   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3569.37  Tc(MIN.) =   59.92
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    5056.27

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610309V.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       84.42   17.57  0.30( 0.30) 1.00      65.9   30900.00
      2       84.32   17.62  0.30( 0.30) 1.00      65.9   30910.00
    TOTAL AREA(ACRES) =       65.9

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	2949.77	20.28	1.582	0.30(0.28)	0.94	1351.5	30800.00
2	3013.35	21.96	1.514	0.30(0.28)	0.94	1472.4	30700.00
3	3070.62	23.74	1.442	0.30(0.28)	0.94	1598.9	30600.00
4	3237.61	29.90	1.253	0.30(0.28)	0.93	2056.7	21300.00
5	3238.61	29.92	1.252	0.30(0.28)	0.93	2059.0	30520.00
6	3277.59	31.06	1.231	0.30(0.28)	0.93	2164.7	30410.00
7	3287.17	31.40	1.225	0.30(0.28)	0.93	2194.2	30540.00
8	3323.11	32.82	1.199	0.30(0.28)	0.93	2306.1	30510.00
9	3335.18	33.36	1.189	0.30(0.28)	0.93	2346.9	30210.00
10	3351.37	33.61	1.184	0.30(0.28)	0.93	2382.2	30200.00
11	3365.76	34.37	1.170	0.30(0.28)	0.92	2474.4	30500.00
12	3387.61	35.83	1.144	0.30(0.28)	0.92	2645.0	30100.00
13	3383.54	36.08	1.139	0.30(0.28)	0.92	2672.3	30400.00
14	3348.95	38.52	1.095	0.30(0.27)	0.91	2935.8	30110.00
15	3401.77	41.89	1.046	0.30(0.27)	0.91	3324.7	30300.00
16	3411.75	42.93	1.033	0.30(0.27)	0.90	3436.0	21400.00
17	3569.37	59.92	0.863	0.30(0.26)	0.87	5056.3	13210.00
18	3568.88	60.03	0.862	0.30(0.26)	0.87	5065.6	13200.00
19	3518.78	62.65	0.849	0.30(0.26)	0.87	5227.7	13100.00
20	3136.68	92.39	0.707	0.30(0.26)	0.86	6520.6	13000.00
21	3079.59	94.87	0.700	0.30(0.26)	0.86	6539.3	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	84.42	17.57	1.724	0.30(0.30)	1.00	65.9	30900.00
2	84.32	17.62	1.721	0.30(0.30)	1.00	65.9	30910.00

LONGEST FLOWPATH FROM NODE 30900.00 TO NODE 13305.80 = 3403.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2918.96	17.57	1.724	0.30(0.28)	0.94	1236.6	30900.00
2	2921.62	17.62	1.721	0.30(0.28)	0.94	1240.0	30910.00
3	3025.81	20.28	1.582	0.30(0.28)	0.94	1417.4	30800.00
4	3085.38	21.96	1.514	0.30(0.28)	0.94	1538.3	30700.00
5	3138.37	23.74	1.442	0.30(0.28)	0.94	1664.8	30600.00
6	3294.14	29.90	1.253	0.30(0.28)	0.94	2122.6	21300.00
7	3295.10	29.92	1.252	0.30(0.28)	0.94	2125.0	30520.00
8	3332.82	31.06	1.231	0.30(0.28)	0.93	2230.7	30410.00
9	3342.03	31.40	1.225	0.30(0.28)	0.93	2260.1	30540.00
10	3376.43	32.82	1.199	0.30(0.28)	0.93	2372.0	30510.00
11	3387.92	33.36	1.189	0.30(0.28)	0.93	2412.8	30210.00
12	3403.83	33.61	1.184	0.30(0.28)	0.93	2448.1	30200.00
13	3417.40	34.37	1.170	0.30(0.28)	0.93	2540.3	30500.00
14	3437.67	35.83	1.144	0.30(0.28)	0.92	2710.9	30100.00
15	3433.34	36.08	1.139	0.30(0.28)	0.92	2738.2	30400.00
16	3396.11	38.52	1.095	0.30(0.27)	0.91	3001.7	30110.00
17	3446.02	41.89	1.046	0.30(0.27)	0.91	3390.6	30300.00
18	3455.26	42.93	1.033	0.30(0.27)	0.90	3502.0	21400.00
19	3602.75	59.92	0.863	0.30(0.26)	0.88	5122.2	13210.00
20	3602.21	60.03	0.862	0.30(0.26)	0.88	5131.6	13200.00
21	3551.35	62.65	0.849	0.30(0.26)	0.87	5293.6	13100.00
22	3160.84	92.39	0.707	0.30(0.26)	0.86	6586.5	13000.00
23	3103.34	94.87	0.700	0.30(0.26)	0.86	6605.2	13010.00

TOTAL AREA(ACRES) = 6605.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3602.75 Tc(MIN.) = 59.924
EFFECTIVE AREA(ACRES) = 5122.19 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.91
TOTAL AREA(ACRES) = 6605.2
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

****
FLOW PROCESS FROM NODE 13305.80 TO NODE 13306.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 254.00 DOWNSTREAM(FEET) = 245.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 583.12 CHANNEL SLOPE = 0.0146
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.97
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.858
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.77	0.30	0.998	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3620.04
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.22
AVERAGE FLOW DEPTH(FEET) = 4.97 TRAVEL TIME(MIN.) = 0.87
Tc(MIN.) = 60.79
SUBAREA AREA(ACRES) = 68.77 SUBAREA RUNOFF(CFS) = 34.58
EFFECTIVE AREA(ACRES) = 5190.96 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88
TOTAL AREA(ACRES) = 6673.9 PEAK FLOW RATE(CFS) = 3602.75
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.95 FLOW VELOCITY(FEET/SEC.) = 11.21
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13306.00 = 46294.83 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2918.96	18.49	1.674	0.30(0.28)	0.94	1305.4	30900.00
2	2921.62	18.54	1.672	0.30(0.28)	0.94	1308.7	30910.00
3	3025.81	21.19	1.545	0.30(0.28)	0.94	1486.2	30800.00
4	3085.38	22.86	1.477	0.30(0.28)	0.94	1607.1	30700.00
5	3138.37	24.64	1.406	0.30(0.28)	0.94	1733.5	30600.00
6	3294.14	30.79	1.236	0.30(0.28)	0.94	2191.4	21300.00
7	3295.10	30.81	1.235	0.30(0.28)	0.94	2193.7	30520.00
8	3332.82	31.94	1.215	0.30(0.28)	0.94	2299.4	30410.00
9	3342.03	32.28	1.208	0.30(0.28)	0.94	2328.8	30540.00
10	3376.43	33.70	1.183	0.30(0.28)	0.93	2440.8	30510.00
11	3387.92	34.24	1.173	0.30(0.28)	0.93	2481.6	30210.00
12	3403.83	34.49	1.168	0.30(0.28)	0.93	2516.9	30200.00
13	3417.40	35.25	1.154	0.30(0.28)	0.93	2609.1	30500.00

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    14     3437.67   36.71    1.128  0.30( 0.28) 0.92    2779.7   30100.00
    15     3433.34   36.95    1.123  0.30( 0.28) 0.92    2807.0   30400.00
    16     3396.11   39.40    1.079  0.30( 0.27) 0.92    3070.5   30110.00
    17     3446.02   42.76    1.035  0.30( 0.27) 0.91    3459.4   30300.00
    18     3455.26   43.81    1.023  0.30( 0.27) 0.91    3570.7   21400.00
    19     3602.75   60.79    0.858  0.30( 0.26) 0.88    5191.0   13210.00
    20     3602.21   60.90    0.858  0.30( 0.26) 0.88    5200.3   13200.00
    21     3551.35   63.52    0.845  0.30( 0.26) 0.88    5362.4   13100.00
    22     3160.84   93.30    0.705  0.30( 0.26) 0.86    6655.3   13000.00
    23     3103.34   95.78    0.698  0.30( 0.26) 0.86    6673.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3602.75  Tc(MIN.) =   60.79
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5190.96

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13307.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    245.50  DOWNSTREAM(FEET) =    220.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1543.21   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.79
  CHANNEL FLOW THRU SUBAREA(CFS) =    3602.75
  FLOW VELOCITY(FEET/SEC.) =  11.70   FLOW DEPTH(FEET) =   4.79
  TRAVEL TIME(MIN.) =   2.20   Tc(MIN.) =   62.99
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2918.96   20.84    1.559  0.30( 0.28) 0.94    1305.4   30900.00
      2     2921.62   20.89    1.557  0.30( 0.28) 0.94    1308.7   30910.00
      3     3025.81   23.52    1.451  0.30( 0.28) 0.94    1486.2   30800.00
      4     3085.38   25.17    1.386  0.30( 0.28) 0.94    1607.1   30700.00
      5     3138.37   26.94    1.336  0.30( 0.28) 0.94    1733.5   30600.00
      6     3294.14   33.05    1.194  0.30( 0.28) 0.94    2191.4   21300.00
      7     3295.10   33.07    1.194  0.30( 0.28) 0.94    2193.7   30520.00
      8     3332.82   34.20    1.174  0.30( 0.28) 0.94    2299.4   30410.00
      9     3342.03   34.53    1.168  0.30( 0.28) 0.94    2328.8   30540.00
     10     3376.43   35.95    1.142  0.30( 0.28) 0.93    2440.8   30510.00
     11     3387.92   36.48    1.132  0.30( 0.28) 0.93    2481.6   30210.00
     12     3403.83   36.73    1.127  0.30( 0.28) 0.93    2516.9   30200.00
     13     3417.40   37.49    1.114  0.30( 0.28) 0.93    2609.1   30500.00
     14     3437.67   38.94    1.087  0.30( 0.28) 0.92    2779.7   30100.00
     15     3433.34   39.18    1.083  0.30( 0.28) 0.92    2807.0   30400.00
     16     3396.11   41.64    1.049  0.30( 0.27) 0.92    3070.5   30110.00
     17     3446.02   44.99    1.009  0.30( 0.27) 0.91    3459.4   30300.00
     18     3455.26   46.03    0.997  0.30( 0.27) 0.91    3570.7   21400.00
     19     3602.75   62.99    0.847  0.30( 0.26) 0.88    5191.0   13210.00
     20     3602.21   63.10    0.847  0.30( 0.26) 0.88    5200.3   13200.00
     21     3551.35   65.73    0.834  0.30( 0.26) 0.88    5362.4   13100.00
     22     3160.84   95.59    0.698  0.30( 0.26) 0.86    6655.3   13000.00
     23     3103.34   98.08    0.691  0.30( 0.26) 0.86    6673.9   13010.00
  NEW PEAK FLOW DATA ARE:
```



```
  PEAK FLOW RATE(CFS) =    3602.75  Tc(MIN.) =   62.99
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5190.96

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610310V.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      105.48   22.38  0.30( 0.30) 1.00      97.9   31000.00
    TOTAL AREA(ACRES) =       97.9

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2918.96   20.84    1.559  0.30( 0.28) 0.94    1305.4   30900.00
      2     2921.62   20.89    1.557  0.30( 0.28) 0.94    1308.7   30910.00
      3     3025.81   23.52    1.451  0.30( 0.28) 0.94    1486.2   30800.00
      4     3085.38   25.17    1.386  0.30( 0.28) 0.94    1607.1   30700.00
      5     3138.37   26.94    1.336  0.30( 0.28) 0.94    1733.5   30600.00
      6     3294.14   33.05    1.194  0.30( 0.28) 0.94    2191.4   21300.00
      7     3295.10   33.07    1.194  0.30( 0.28) 0.94    2193.7   30520.00
      8     3332.82   34.20    1.174  0.30( 0.28) 0.94    2299.4   30410.00
      9     3342.03   34.53    1.168  0.30( 0.28) 0.94    2328.8   30540.00
     10     3376.43   35.95    1.142  0.30( 0.28) 0.93    2440.8   30510.00
     11     3387.92   36.48    1.132  0.30( 0.28) 0.93    2481.6   30210.00
     12     3403.83   36.73    1.127  0.30( 0.28) 0.93    2516.9   30200.00
     13     3417.40   37.49    1.114  0.30( 0.28) 0.93    2609.1   30500.00
     14     3437.67   38.94    1.087  0.30( 0.28) 0.92    2779.7   30100.00
     15     3433.34   39.18    1.083  0.30( 0.28) 0.92    2807.0   30400.00
     16     3396.11   41.64    1.049  0.30( 0.27) 0.92    3070.5   30110.00
     17     3446.02   44.99    1.009  0.30( 0.27) 0.91    3459.4   30300.00
     18     3455.26   46.03    0.997  0.30( 0.27) 0.91    3570.7   21400.00
     19     3602.75   62.99    0.847  0.30( 0.26) 0.88    5191.0   13210.00
     20     3602.21   63.10    0.847  0.30( 0.26) 0.88    5200.3   13200.00
     21     3551.35   65.73    0.834  0.30( 0.26) 0.88    5362.4   13100.00
     22     3160.84   95.59    0.698  0.30( 0.26) 0.86    6655.3   13000.00
     23     3103.34   98.08    0.691  0.30( 0.26) 0.86    6673.9   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      105.48   22.38    1.497  0.30( 0.30) 1.00      97.9   31000.00
LONGEST FLOWPATH FROM NODE  31000.00 TO NODE  13307.00 =    5162.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3022.28   20.84    1.559  0.30( 0.28) 0.95    1396.5   30900.00
    2     3025.01   20.89    1.557  0.30( 0.28) 0.95    1400.1   30910.00
    3     3086.29   22.38    1.497  0.30( 0.28) 0.95    1507.4   31000.00
    4     3127.25   23.52    1.451  0.30( 0.28) 0.95    1584.1   30800.00
    5     3181.11   25.17    1.386  0.30( 0.28) 0.94    1705.0   30700.00
    6     3229.72   26.94    1.336  0.30( 0.28) 0.94    1831.4   30600.00
    7     3372.98   33.05    1.194  0.30( 0.28) 0.94    2289.2   21300.00
    8     3373.91   33.07    1.194  0.30( 0.28) 0.94    2291.6   30520.00
    9     3409.83   34.20    1.174  0.30( 0.28) 0.94    2397.3   30410.00
   10     3418.51   34.53    1.168  0.30( 0.28) 0.94    2426.7   30540.00
   11     3450.64   35.95    1.142  0.30( 0.28) 0.94    2538.7   30510.00
   12     3461.26   36.48    1.132  0.30( 0.28) 0.93    2579.5   30210.00
   13     3476.78   36.73    1.127  0.30( 0.28) 0.93    2614.8   30200.00
   14     3489.14   37.49    1.114  0.30( 0.28) 0.93    2706.9   30500.00
   15     3507.08   38.94    1.087  0.30( 0.28) 0.93    2877.5   30100.00
   16     3502.36   39.18    1.083  0.30( 0.28) 0.93    2904.8   30400.00
   17     3462.11   41.64    1.049  0.30( 0.28) 0.92    3168.4   30110.00
   18     3508.54   44.99    1.009  0.30( 0.27) 0.91    3557.3   30300.00
   19     3516.70   46.03    0.997  0.30( 0.27) 0.91    3668.6   21400.00
   20     3651.02   62.99    0.847  0.30( 0.26) 0.88    5288.8   13210.00
   21     3650.44   63.10    0.847  0.30( 0.26) 0.88    5298.2   13200.00
   22     3598.43   65.73    0.834  0.30( 0.26) 0.88    5460.3   13100.00
   23     3195.98   95.59    0.698  0.30( 0.26) 0.86    6753.1   13000.00
   24     3137.85   98.08    0.691  0.30( 0.26) 0.86    6771.8   13010.00
  TOTAL AREA(ACRES) =      6771.8

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     3651.02  Tc(MIN.) =   62.989
 EFFECTIVE AREA(ACRES) =   5288.84  AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.91
 TOTAL AREA(ACRES) =     6771.8
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    220.00  DOWNSTREAM(FEET) =    212.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.0086
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.77
 CHANNEL FLOW THRU SUBAREA(CFS) =    3651.02
 FLOW VELOCITY(FEET/SEC.) =   9.40   FLOW DEPTH(FEET) =   5.77
 TRAVEL TIME(MIN.) =   1.64   Tc(MIN.) =   64.63
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3022.28   22.58    1.489  0.30( 0.28) 0.95    1396.5   30900.00
    2     3025.01   22.63    1.487  0.30( 0.28) 0.95    1400.1   30910.00
    3     3086.29   24.11    1.427  0.30( 0.28) 0.95    1507.4   31000.00
    4     3127.25   25.24    1.384  0.30( 0.28) 0.95    1584.1   30800.00
    5     3181.11   26.88    1.338  0.30( 0.28) 0.94    1705.0   30700.00
    6     3229.72   28.64    1.288  0.30( 0.28) 0.94    1831.4   30600.00
    7     3372.98   34.73    1.164  0.30( 0.28) 0.94    2289.2   21300.00
    8     3373.91   34.76    1.163  0.30( 0.28) 0.94    2291.6   30520.00
    9     3409.83   35.87    1.143  0.30( 0.28) 0.94    2397.3   30410.00
   10     3418.51   36.21    1.137  0.30( 0.28) 0.94    2426.7   30540.00
   11     3450.64   37.62    1.111  0.30( 0.28) 0.94    2538.7   30510.00
   12     3461.26   38.15    1.102  0.30( 0.28) 0.93    2579.5   30210.00
   13     3476.78   38.40    1.097  0.30( 0.28) 0.93    2614.8   30200.00
   14     3489.14   39.15    1.083  0.30( 0.28) 0.93    2706.9   30500.00
   15     3507.08   40.60    1.061  0.30( 0.28) 0.93    2877.5   30100.00
   16     3502.36   40.85    1.058  0.30( 0.28) 0.93    2904.8   30400.00
   17     3462.11   43.31    1.029  0.30( 0.28) 0.92    3168.4   30110.00
   18     3508.54   46.65    0.989  0.30( 0.27) 0.91    3557.3   30300.00
   19     3516.70   47.69    0.977  0.30( 0.27) 0.91    3668.6   21400.00
   20     3651.02   64.63    0.839  0.30( 0.26) 0.88    5288.8   13210.00
   21     3650.44   64.74    0.839  0.30( 0.26) 0.88    5298.2   13200.00
   22     3598.43   67.38    0.826  0.30( 0.26) 0.88    5460.3   13100.00
   23     3195.98   97.30    0.693  0.30( 0.26) 0.86    6753.1   13000.00
   24     3137.85   99.80    0.686  0.30( 0.26) 0.86    6771.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    3651.02  Tc(MIN.) =   64.63
 AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5288.84

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610212V.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      256.65   36.47  0.30( 0.30) 1.00     342.8   21200.00
   TOTAL AREA(ACRES) =      342.8

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3022.28   22.58    1.489  0.30( 0.28) 0.95    1396.5   30900.00
```

```
    2     3025.01   22.63    1.487  0.30( 0.28) 0.95    1400.1   30910.00
    3     3086.29   24.11    1.427  0.30( 0.28) 0.95    1507.4   31000.00
    4     3127.25   25.24    1.384  0.30( 0.28) 0.95    1584.1   30800.00
    5     3181.11   26.88    1.338  0.30( 0.28) 0.94    1705.0   30700.00
    6     3229.72   28.64    1.288  0.30( 0.28) 0.94    1831.4   30600.00
    7     3372.98   34.73    1.164  0.30( 0.28) 0.94    2289.2   21300.00
    8     3373.91   34.76    1.163  0.30( 0.28) 0.94    2291.6   30520.00
    9     3409.83   35.87    1.143  0.30( 0.28) 0.94    2397.3   30410.00
   10     3418.51   36.21    1.137  0.30( 0.28) 0.94    2426.7   30540.00
   11     3450.64   37.62    1.111  0.30( 0.28) 0.94    2538.7   30510.00
   12     3461.26   38.15    1.102  0.30( 0.28) 0.93    2579.5   30210.00
   13     3476.78   38.40    1.097  0.30( 0.28) 0.93    2614.8   30200.00
   14     3489.14   39.15    1.083  0.30( 0.28) 0.93    2706.9   30500.00
   15     3507.08   40.60    1.061  0.30( 0.28) 0.93    2877.5   30100.00
   16     3502.36   40.85    1.058  0.30( 0.28) 0.93    2904.8   30400.00
   17     3462.11   43.31    1.029  0.30( 0.28) 0.92    3168.4   30110.00
   18     3508.54   46.65    0.989  0.30( 0.27) 0.91    3557.3   30300.00
   19     3516.70   47.69    0.977  0.30( 0.27) 0.91    3668.6   21400.00
   20     3651.02   64.63    0.839  0.30( 0.26) 0.88    5288.8   13210.00
   21     3650.44   64.74    0.839  0.30( 0.26) 0.88    5298.2   13200.00
   22     3598.43   67.38    0.826  0.30( 0.26) 0.88    5460.3   13100.00
   23     3195.98   97.30    0.693  0.30( 0.26) 0.86    6753.1   13000.00
   24     3137.85   99.80    0.686  0.30( 0.26) 0.86    6771.8   13010.00
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      256.65   36.47    1.132  0.30( 0.30) 1.00     342.8   21200.00
LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  13308.00 =   11049.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3249.24   22.58    1.489  0.30( 0.29) 0.95    1608.7   30900.00
    2     3252.09   22.63    1.487  0.30( 0.29) 0.95    1612.7   30910.00
    3     3316.03   24.11    1.427  0.30( 0.29) 0.95    1734.0   31000.00
    4     3358.64   25.24    1.384  0.30( 0.29) 0.95    1821.3   30800.00
    5     3417.03   26.88    1.338  0.30( 0.29) 0.95    1957.6   30700.00
    6     3469.07   28.64    1.288  0.30( 0.29) 0.95    2100.6   30600.00
    7     3626.69   34.73    1.164  0.30( 0.28) 0.95    2615.7   21300.00
    8     3627.67   34.76    1.163  0.30( 0.28) 0.95    2618.3   30520.00
    9     3665.57   35.87    1.143  0.30( 0.28) 0.95    2734.4   30410.00
   10     3674.77   36.21    1.137  0.30( 0.28) 0.95    2767.0   30540.00
   11     3681.22   36.47    1.132  0.30( 0.28) 0.95    2790.6   21200.00
   12     3700.88   37.62    1.111  0.30( 0.28) 0.94    2881.4   30510.00
   13     3708.49   38.15    1.102  0.30( 0.28) 0.94    2922.3   30210.00
   14     3722.62   38.40    1.097  0.30( 0.28) 0.94    2957.6   30200.00
   15     3730.76   39.15    1.083  0.30( 0.28) 0.94    3049.7   30500.00
   16     3741.75   40.60    1.061  0.30( 0.28) 0.93    3220.3   30100.00
   17     3736.13   40.85    1.058  0.30( 0.28) 0.93    3247.6   30400.00
   18     3686.92   43.31    1.029  0.30( 0.28) 0.93    3511.1   30110.00
   19     3721.19   46.65    0.989  0.30( 0.28) 0.92    3900.1   30300.00
   20     3725.56   47.69    0.977  0.30( 0.28) 0.92    4011.4   21400.00
   21     3817.31   64.63    0.839  0.30( 0.27) 0.89    5631.6   13210.00
   22     3816.56   64.74    0.839  0.30( 0.27) 0.89    5641.0   13200.00
   23     3760.53   67.38    0.826  0.30( 0.27) 0.88    5803.0   13100.00
   24     3317.29   97.30    0.693  0.30( 0.26) 0.87    7095.9   13000.00
```



```
   25     3256.98   99.80    0.686  0.30( 0.26) 0.87    7114.6   13010.00
  TOTAL AREA(ACRES) =      7114.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3817.31  Tc(MIN.) =   64.630
  EFFECTIVE AREA(ACRES) =   5631.62  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.92
  TOTAL AREA(ACRES) =     7114.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S29.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    13016.70   19.12  0.30( 0.30) 0.99    3032.0   50400.00
      2    14751.25   29.54  0.30( 0.30) 0.99    5600.7   50300.00
      3    16814.63   42.07  0.30( 0.30) 0.99    8950.8   12710.00
      4    17809.02   50.16  0.30( 0.30) 0.99   11707.4   31400.00
      5    18855.60   60.04  0.30( 0.30) 0.99   15041.8   40100.00
      6    19583.33   70.68  0.30( 0.30) 0.99   18307.9   11801.00
      7    20787.25   84.29  0.30( 0.30) 0.99   23300.7   11530.00
      8    21618.61   92.47  0.30( 0.30) 0.99   27165.8   11900.00
      9    23106.99  102.19  0.30( 0.30) 0.99   32999.0   11330.00
     10    23946.72  110.39  0.30( 0.30) 0.99   38083.6   10630.00
     11    23842.88  115.98  0.30( 0.30) 0.99   40677.4   12330.00
     12    23714.16  122.58  0.30( 0.30) 0.99   43816.0   11600.00
     13    23447.63  128.34  0.30( 0.30) 0.99   46048.4   11111.00
     14    23145.17  134.46  0.30( 0.30) 0.99   47984.7   12201.00
     15    22398.17  143.36  0.30( 0.30) 0.99   50072.4   12231.00
     16    21701.93  150.82  0.30( 0.30) 0.99   51485.7   10400.00
     17    20580.12  162.17  0.30( 0.30) 0.99   53102.9   10320.00
     18    19988.65  167.04  0.30( 0.30) 0.99   53330.8   10210.00
     19    19482.62  171.85  0.30( 0.30) 0.99   53492.2   12000.00
     20    16817.75  200.95  0.30( 0.30) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =    54110.0
```

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****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    13016.70   19.12  0.30( 0.30) 0.99    3032.0   50400.00
      2    14751.25   29.54  0.30( 0.30) 0.99    5600.7   50300.00
      3    16814.63   42.07  0.30( 0.30) 0.99    8950.8   12710.00
      4    17809.02   50.16  0.30( 0.30) 0.99   11707.4   31400.00
      5    18855.60   60.04  0.30( 0.30) 0.99   15041.8   40100.00
      6    19583.33   70.68  0.30( 0.30) 0.99   18307.9   11801.00
      7    20787.25   84.29  0.30( 0.30) 0.99   23300.7   11530.00
      8    21618.61   92.47  0.30( 0.30) 0.99   27165.8   11900.00
      9    23106.99  102.19  0.30( 0.30) 0.99   32999.0   11330.00
     10    23946.72  110.39  0.30( 0.30) 0.99   38083.6   10630.00
     11    23842.88  115.98  0.30( 0.30) 0.99   40677.4   12330.00
     12    23714.16  122.58  0.30( 0.30) 0.99   43816.0   11600.00
     13    23447.63  128.34  0.30( 0.30) 0.99   46048.4   11111.00
     14    23145.17  134.46  0.30( 0.30) 0.99   47984.7   12201.00
     15    22398.17  143.36  0.30( 0.30) 0.99   50072.4   12231.00
     16    21701.93  150.82  0.30( 0.30) 0.99   51485.7   10400.00
     17    20580.12  162.17  0.30( 0.30) 0.99   53102.9   10320.00
     18    19988.65  167.04  0.30( 0.30) 0.99   53330.8   10210.00
     19    19482.62  171.85  0.30( 0.30) 0.99   53492.2   12000.00
     20    16817.75  200.95  0.30( 0.30) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =     54110.0

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  13308.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    213.00  DOWNSTREAM(FEET) =    212.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1389.52   CHANNEL SLOPE =  0.0007
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.71
  CHANNEL FLOW THRU SUBAREA(CFS) =   23946.72
  FLOW VELOCITY(FEET/SEC.) =   6.51   FLOW DEPTH(FEET) =  13.71
  TRAVEL TIME(MIN.) =   3.56   Tc(MIN.) =  113.95
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13016.70   23.44    1.454  0.30( 0.30) 0.99    3032.0   50400.00
      2    14751.25   33.69    1.183  0.30( 0.30) 0.99    5600.7   50300.00
      3    16814.63   46.05    0.997  0.30( 0.30) 0.99    8950.8   12710.00
      4    17809.02   54.07    0.914  0.30( 0.30) 0.99   11707.4   31400.00
      5    18855.60   63.88    0.843  0.30( 0.30) 0.99   15041.8   40100.00
      6    19583.33   74.47    0.791  0.30( 0.30) 0.99   18307.9   11801.00
      7    20787.25   88.01    0.724  0.30( 0.30) 0.99   23300.7   11530.00
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      8    21618.61   96.15    0.697  0.30( 0.30) 0.99   27165.8   11900.00
      9    23106.99  105.79    0.669  0.30( 0.30) 0.99   32999.0   11330.00
     10    23946.72  113.95    0.646  0.30( 0.30) 0.99   38083.6   10630.00
     11    23842.88  119.54    0.630  0.30( 0.30) 0.99   40677.4   12330.00
     12    23714.16  126.15    0.619  0.30( 0.30) 0.99   43816.0   11600.00
     13    23447.63  131.92    0.609  0.30( 0.30) 0.99   46048.4   11111.00
     14    23145.17  138.06    0.598  0.30( 0.30) 0.99   47984.7   12201.00
     15    22398.17  146.99    0.583  0.30( 0.30) 0.99   50072.4   12231.00
     16    21701.93  154.49    0.570  0.30( 0.30) 0.99   51485.7   10400.00
     17    20580.12  165.90    0.551  0.30( 0.30) 0.99   53102.9   10320.00
     18    19988.65  170.80    0.543  0.30( 0.30) 0.99   53330.8   10210.00
     19    19482.62  175.65    0.534  0.30( 0.30) 0.99   53492.2   12000.00
     20    16817.75  204.93    0.508  0.30( 0.30) 0.99   54110.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   23946.72  Tc(MIN.) =  113.95
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   38083.56

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13016.70   23.44    1.454  0.30( 0.30) 0.99    3032.0   50400.00
      2    14751.25   33.69    1.183  0.30( 0.30) 0.99    5600.7   50300.00
      3    16814.63   46.05    0.997  0.30( 0.30) 0.99    8950.8   12710.00
      4    17809.02   54.07    0.914  0.30( 0.30) 0.99   11707.4   31400.00
      5    18855.60   63.88    0.843  0.30( 0.30) 0.99   15041.8   40100.00
      6    19583.33   74.47    0.791  0.30( 0.30) 0.99   18307.9   11801.00
      7    20787.25   88.01    0.724  0.30( 0.30) 0.99   23300.7   11530.00
      8    21618.61   96.15    0.697  0.30( 0.30) 0.99   27165.8   11900.00
      9    23106.99  105.79    0.669  0.30( 0.30) 0.99   32999.0   11330.00
     10    23946.72  113.95    0.646  0.30( 0.30) 0.99   38083.6   10630.00
     11    23842.88  119.54    0.630  0.30( 0.30) 0.99   40677.4   12330.00
     12    23714.16  126.15    0.619  0.30( 0.30) 0.99   43816.0   11600.00
     13    23447.63  131.92    0.609  0.30( 0.30) 0.99   46048.4   11111.00
     14    23145.17  138.06    0.598  0.30( 0.30) 0.99   47984.7   12201.00
     15    22398.17  146.99    0.583  0.30( 0.30) 0.99   50072.4   12231.00
     16    21701.93  154.49    0.570  0.30( 0.30) 0.99   51485.7   10400.00
     17    20580.12  165.90    0.551  0.30( 0.30) 0.99   53102.9   10320.00
     18    19988.65  170.80    0.543  0.30( 0.30) 0.99   53330.8   10210.00
     19    19482.62  175.65    0.534  0.30( 0.30) 0.99   53492.2   12000.00
     20    16817.75  204.93    0.508  0.30( 0.30) 0.99   54110.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3249.24   22.58    1.489  0.30( 0.29) 0.95    1608.7   30900.00
      2     3252.09   22.63    1.487  0.30( 0.29) 0.95    1612.7   30910.00
      3     3316.03   24.11    1.427  0.30( 0.29) 0.95    1734.0   31000.00
      4     3358.64   25.24    1.384  0.30( 0.29) 0.95    1821.3   30800.00
      5     3417.03   26.88    1.338  0.30( 0.29) 0.95    1957.6   30700.00
      6     3469.07   28.64    1.288  0.30( 0.29) 0.95    2100.6   30600.00
```

7	3626.69	34.73	1.164	0.30(0.28)	0.95	2615.7	21300.00
8	3627.67	34.76	1.163	0.30(0.28)	0.95	2618.3	30520.00
9	3665.57	35.87	1.143	0.30(0.28)	0.95	2734.4	30410.00
10	3674.77	36.21	1.137	0.30(0.28)	0.95	2767.0	30540.00
11	3681.22	36.47	1.132	0.30(0.28)	0.95	2790.6	21200.00
12	3700.88	37.62	1.111	0.30(0.28)	0.94	2881.4	30510.00
13	3708.49	38.15	1.102	0.30(0.28)	0.94	2922.3	30210.00
14	3722.62	38.40	1.097	0.30(0.28)	0.94	2957.6	30200.00
15	3730.76	39.15	1.083	0.30(0.28)	0.94	3049.7	30500.00
16	3741.75	40.60	1.061	0.30(0.28)	0.93	3220.3	30100.00
17	3736.13	40.85	1.058	0.30(0.28)	0.93	3247.6	30400.00
18	3686.92	43.31	1.029	0.30(0.28)	0.93	3511.1	30110.00
19	3721.19	46.65	0.989	0.30(0.28)	0.92	3900.1	30300.00
20	3725.56	47.69	0.977	0.30(0.28)	0.92	4011.4	21400.00
21	3817.31	64.63	0.839	0.30(0.27)	0.89	5631.6	13210.00
22	3816.56	64.74	0.839	0.30(0.27)	0.89	5641.0	13200.00
23	3760.53	67.38	0.826	0.30(0.27)	0.88	5803.0	13100.00
24	3317.29	97.30	0.693	0.30(0.26)	0.87	7095.9	13000.00
25	3256.98	99.80	0.686	0.30(0.26)	0.87	7114.6	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16164.36	22.58	1.489	0.30(0.29)	0.97	4529.4	30900.00
2	16173.46	22.63	1.487	0.30(0.29)	0.97	4539.5	30910.00
3	16303.89	23.44	1.454	0.30(0.29)	0.97	4711.3	50400.00
4	16445.93	24.11	1.427	0.30(0.29)	0.97	4933.7	31000.00
5	16679.31	25.24	1.384	0.30(0.29)	0.97	5303.4	30800.00
6	17016.00	26.88	1.338	0.30(0.29)	0.97	5851.9	30700.00
7	17365.70	28.64	1.288	0.30(0.29)	0.97	6435.7	30600.00
8	18351.00	33.69	1.183	0.30(0.29)	0.97	8128.3	50300.00
9	18551.83	34.73	1.164	0.30(0.29)	0.97	8498.7	21300.00
10	18556.72	34.76	1.163	0.30(0.29)	0.97	8507.6	30520.00
11	18780.75	35.87	1.143	0.30(0.29)	0.97	8926.0	30410.00
12	18846.01	36.21	1.137	0.30(0.29)	0.97	9049.6	30540.00
13	18896.85	36.47	1.132	0.30(0.29)	0.97	9145.3	21200.00
14	19107.48	37.62	1.111	0.30(0.29)	0.97	9546.1	30510.00
15	19204.44	38.15	1.102	0.30(0.29)	0.97	9732.0	30210.00
16	19259.82	38.40	1.097	0.30(0.29)	0.97	9834.3	30200.00
17	19393.57	39.15	1.083	0.30(0.29)	0.97	10130.4	30500.00
18	19646.67	40.60	1.061	0.30(0.29)	0.97	10694.1	30100.00
19	19682.14	40.85	1.058	0.30(0.29)	0.97	10788.1	30400.00
20	20044.18	43.31	1.029	0.30(0.29)	0.97	11719.3	30110.00
21	20529.64	46.05	0.997	0.30(0.29)	0.97	12780.7	12710.00
22	20610.64	46.65	0.989	0.30(0.29)	0.97	13058.2	30300.00
23	20744.16	47.69	0.977	0.30(0.29)	0.97	13527.6	21400.00
24	21569.09	54.07	0.914	0.30(0.29)	0.97	16328.4	31400.00
25	22668.82	63.88	0.843	0.30(0.29)	0.96	20601.3	40100.00
26	22724.73	64.63	0.839	0.30(0.29)	0.96	20906.0	13210.00
27	22731.39	64.74	0.839	0.30(0.29)	0.96	20948.6	13200.00
28	22856.95	67.38	0.826	0.30(0.29)	0.96	21925.7	13100.00
29	23238.87	74.47	0.791	0.30(0.29)	0.96	24417.2	11801.00
30	24242.09	88.01	0.724	0.30(0.29)	0.97	29995.4	11530.00
31	24952.90	96.15	0.697	0.30(0.29)	0.97	34212.1	11900.00
32	25113.06	97.30	0.693	0.30(0.29)	0.97	34956.0	13000.00
33	25439.55	99.80	0.686	0.30(0.29)	0.97	36490.7	13010.00
34	26234.08	105.79	0.669	0.30(0.29)	0.97	40113.6	11330.00

35	26896.68	113.95	0.646	0.30(0.29)	0.97	45198.2	10630.00
36	26671.55	119.54	0.630	0.30(0.29)	0.97	47792.0	12330.00
37	26452.91	126.15	0.619	0.30(0.29)	0.98	50930.6	11600.00
38	26111.25	131.92	0.609	0.30(0.29)	0.98	53163.0	11111.00
39	25728.86	138.06	0.598	0.30(0.29)	0.98	55099.3	12201.00
40	24865.58	146.99	0.583	0.30(0.29)	0.98	57187.0	12231.00
41	24071.66	154.49	0.570	0.30(0.29)	0.98	58600.3	10400.00
42	22801.34	165.90	0.551	0.30(0.29)	0.98	60217.5	10320.00
43	22146.05	170.80	0.543	0.30(0.29)	0.98	60445.4	10210.00
44	21576.95	175.65	0.534	0.30(0.29)	0.98	60606.9	12000.00
45	18708.04	204.93	0.508	0.30(0.29)	0.98	61224.6	10100.00

TOTAL AREA(ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 26896.68 Tc(MIN.) = 113.954
EFFECTIVE AREA(ACRES) = 45198.16 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 61224.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 61224.6 TC(MIN.) = 113.95
EFFECTIVE AREA(ACRES) = 45198.16 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.974
PEAK FLOW RATE(CFS) = 26896.68

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16164.36	22.58	1.489	0.30(0.29)	0.97	4529.4	30900.00
2	16173.46	22.63	1.487	0.30(0.29)	0.97	4539.5	30910.00
3	16303.89	23.44	1.454	0.30(0.29)	0.97	4711.3	50400.00
4	16445.93	24.11	1.427	0.30(0.29)	0.97	4933.7	31000.00
5	16679.31	25.24	1.384	0.30(0.29)	0.97	5303.4	30800.00
6	17016.00	26.88	1.338	0.30(0.29)	0.97	5851.9	30700.00
7	17365.70	28.64	1.288	0.30(0.29)	0.97	6435.7	30600.00
8	18351.00	33.69	1.183	0.30(0.29)	0.97	8128.3	50300.00
9	18551.83	34.73	1.164	0.30(0.29)	0.97	8498.7	21300.00
10	18556.72	34.76	1.163	0.30(0.29)	0.97	8507.6	30520.00
11	18780.75	35.87	1.143	0.30(0.29)	0.97	8926.0	30410.00
12	18846.01	36.21	1.137	0.30(0.29)	0.97	9049.6	30540.00
13	18896.85	36.47	1.132	0.30(0.29)	0.97	9145.3	21200.00
14	19107.48	37.62	1.111	0.30(0.29)	0.97	9546.1	30510.00
15	19204.44	38.15	1.102	0.30(0.29)	0.97	9732.0	30210.00
16	19259.82	38.40	1.097	0.30(0.29)	0.97	9834.3	30200.00
17	19393.57	39.15	1.083	0.30(0.29)	0.97	10130.4	30500.00
18	19646.67	40.60	1.061	0.30(0.29)	0.97	10694.1	30100.00
19	19682.14	40.85	1.058	0.30(0.29)	0.97	10788.1	30400.00
20	20044.18	43.31	1.029	0.30(0.29)	0.97	11719.3	30110.00
21	20529.64	46.05	0.997	0.30(0.29)	0.97	12780.7	12710.00
22	20610.64	46.65	0.989	0.30(0.29)	0.97	13058.2	30300.00
23	20744.16	47.69	0.977	0.30(0.29)	0.97	13527.6	21400.00
24	21569.09	54.07	0.914	0.30(0.29)	0.97	16328.4	31400.00
25	22668.82	63.88	0.843	0.30(0.29)	0.96	20601.3	40100.00
26	22724.73	64.63	0.839	0.30(0.29)	0.96	20906.0	13210.00
27	22731.39	64.74	0.839	0.30(0.29)	0.96	20948.6	13200.00
28	22856.95	67.38	0.826	0.30(0.29)	0.96	21925.7	13100.00
29	23238.87	74.47	0.791	0.30(0.29)	0.96	24417.2	11801.00

30	24242.09	88.01	0.724	0.30(0.29)	0.97	29995.4	11530.00
31	24952.90	96.15	0.697	0.30(0.29)	0.97	34212.1	11900.00
32	25113.06	97.30	0.693	0.30(0.29)	0.97	34956.0	13000.00
33	25439.55	99.80	0.686	0.30(0.29)	0.97	36490.7	13010.00
34	26234.08	105.79	0.669	0.30(0.29)	0.97	40113.6	11330.00
35	26896.68	113.95	0.646	0.30(0.29)	0.97	45198.2	10630.00
36	26671.55	119.54	0.630	0.30(0.29)	0.97	47792.0	12330.00
37	26452.91	126.15	0.619	0.30(0.29)	0.98	50930.6	11600.00
38	26111.25	131.92	0.609	0.30(0.29)	0.98	53163.0	11111.00
39	25728.86	138.06	0.598	0.30(0.29)	0.98	55099.3	12201.00
40	24865.58	146.99	0.583	0.30(0.29)	0.98	57187.0	12231.00
41	24071.66	154.49	0.570	0.30(0.29)	0.98	58600.3	10400.00
42	22801.34	165.90	0.551	0.30(0.29)	0.98	60217.5	10320.00
43	22146.05	170.80	0.543	0.30(0.29)	0.98	60445.4	10210.00
44	21576.95	175.65	0.534	0.30(0.29)	0.98	60606.9	12000.00
45	18708.04	204.93	0.508	0.30(0.29)	0.98	61224.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S34.DAT
  TIME/DATE OF STUDY: 09:03 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.760
   2)   10.00;  2.509
   3)   15.00;  1.860
   4)   20.00;  1.590
   5)   25.00;  1.388
   6)   30.00;  1.249
   7)   40.00;  1.066
   8)   50.00;  0.948
   9)   60.00;  0.860
  10)   90.00;  0.712
  11)  120.00;  0.628
  12)  180.00;  0.525
  13)  360.00;  0.386
  14) 1200.00;  0.169
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S33.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    17365.70   28.64  0.30( 0.29) 0.97    6435.7   30600.00
      2    18896.85   36.47  0.30( 0.29) 0.97    9145.3   21200.00
      3    20744.16   47.69  0.30( 0.29) 0.97   13527.6   21400.00
      4    21569.09   54.07  0.30( 0.29) 0.97   16328.4   31400.00
      5    22856.95   67.38  0.30( 0.29) 0.96   21925.7   13100.00
      6    23238.87   74.47  0.30( 0.29) 0.96   24417.2   11801.00
      7    24242.09   88.01  0.30( 0.29) 0.97   29995.4   11530.00
      8    25439.55   99.80  0.30( 0.29) 0.97   36490.7   13010.00
      9    26234.08  105.79  0.30( 0.29) 0.97   40113.6   11330.00
     10    26896.68  113.95  0.30( 0.29) 0.97   45198.2   10630.00
     11    26671.55  119.54  0.30( 0.29) 0.97   47792.0   12330.00
     12    26452.91  126.15  0.30( 0.29) 0.98   50930.6   11600.00
     13    26111.25  131.92  0.30( 0.29) 0.98   53163.0   11111.00
     14    25728.86  138.06  0.30( 0.29) 0.98   55099.3   12201.00
     15    24865.58  146.99  0.30( 0.29) 0.98   57187.0   12231.00
     16    24071.66  154.49  0.30( 0.29) 0.98   58600.3   10400.00
     17    22801.34  165.90  0.30( 0.29) 0.98   60217.5   10320.00
     18    22146.05  170.80  0.30( 0.29) 0.98   60445.4   10210.00
     19    21576.95  175.65  0.30( 0.29) 0.98   60606.9   12000.00
     20    18708.04  204.93  0.30( 0.29) 0.98   61224.6   10100.00
   TOTAL AREA(ACRES) =    61224.6

**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    17365.70   28.64  0.30( 0.29) 0.97    6435.7   30600.00
      2    18896.85   36.47  0.30( 0.29) 0.97    9145.3   21200.00
      3    20744.16   47.69  0.30( 0.29) 0.97   13527.6   21400.00
      4    21569.09   54.07  0.30( 0.29) 0.97   16328.4   31400.00
      5    22856.95   67.38  0.30( 0.29) 0.96   21925.7   13100.00
      6    23238.87   74.47  0.30( 0.29) 0.96   24417.2   11801.00
      7    24242.09   88.01  0.30( 0.29) 0.97   29995.4   11530.00
      8    25439.55   99.80  0.30( 0.29) 0.97   36490.7   13010.00
      9    26234.08  105.79  0.30( 0.29) 0.97   40113.6   11330.00
     10    26896.68  113.95  0.30( 0.29) 0.97   45198.2   10630.00
     11    26671.55  119.54  0.30( 0.29) 0.97   47792.0   12330.00
     12    26452.91  126.15  0.30( 0.29) 0.98   50930.6   11600.00
     13    26111.25  131.92  0.30( 0.29) 0.98   53163.0   11111.00
     14    25728.86  138.06  0.30( 0.29) 0.98   55099.3   12201.00
     15    24865.58  146.99  0.30( 0.29) 0.98   57187.0   12231.00
     16    24071.66  154.49  0.30( 0.29) 0.98   58600.3   10400.00
     17    22801.34  165.90  0.30( 0.29) 0.98   60217.5   10320.00
     18    22146.05  170.80  0.30( 0.29) 0.98   60445.4   10210.00
```

```
     19    21576.95  175.65  0.30( 0.29) 0.98   60606.9   12000.00
     20    18708.04  204.93  0.30( 0.29) 0.98   61224.6   10100.00
    TOTAL AREA(ACRES) =     61224.6

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13402.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    212.00  DOWNSTREAM(FEET) =    209.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   623.02   CHANNEL SLOPE =  0.0048
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.59
  CHANNEL FLOW THRU SUBAREA(CFS) =   26896.68
  FLOW VELOCITY(FEET/SEC.) =  12.88   FLOW DEPTH(FEET) =   8.59
  TRAVEL TIME(MIN.) =   0.81   Tc(MIN.) =  114.76
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610505V.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      172.78   21.02  0.30( 0.30) 0.99     153.2   50500.00
    TOTAL AREA(ACRES) =      153.2

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    17365.70   29.57    1.261  0.30( 0.29) 0.97    6435.7   30600.00
      2    18896.85   37.38    1.114  0.30( 0.29) 0.97    9145.3   21200.00
      3    20744.16   48.57    0.965  0.30( 0.29) 0.97   13527.6   21400.00
      4    21569.09   54.93    0.905  0.30( 0.29) 0.97   16328.4   31400.00
      5    22856.95   68.23    0.819  0.30( 0.29) 0.96   21925.7   13100.00
      6    23238.87   75.31    0.784  0.30( 0.29) 0.96   24417.2   11801.00
      7    24242.09   88.85    0.718  0.30( 0.29) 0.97   29995.4   11530.00
      8    25439.55  100.62    0.682  0.30( 0.29) 0.97   36490.7   13010.00
      9    26234.08  106.60    0.666  0.30( 0.29) 0.97   40113.6   11330.00
     10    26896.68  114.76    0.643  0.30( 0.29) 0.97   45198.2   10630.00
     11    26671.55  120.35    0.627  0.30( 0.29) 0.97   47792.0   12330.00
     12    26452.91  126.96    0.616  0.30( 0.29) 0.98   50930.6   11600.00
     13    26111.25  132.73    0.606  0.30( 0.29) 0.98   53163.0   11111.00
     14    25728.86  138.88    0.596  0.30( 0.29) 0.98   55099.3   12201.00
     15    24865.58  147.82    0.580  0.30( 0.29) 0.98   57187.0   12231.00
     16    24071.66  155.33    0.567  0.30( 0.29) 0.98   58600.3   10400.00
     17    22801.34  166.75    0.548  0.30( 0.29) 0.98   60217.5   10320.00
```



```
     18    22146.05  171.66    0.539  0.30( 0.29) 0.98   60445.4   10210.00
     19    21576.95  176.52    0.531  0.30( 0.29) 0.98   60606.9   12000.00
     20    18708.04  205.83    0.505  0.30( 0.29) 0.98   61224.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      172.78   21.02    1.549  0.30( 0.30) 0.99     153.2   50500.00
  LONGEST FLOWPATH FROM NODE  50500.00 TO NODE  13402.00 =    6247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16184.92   21.02    1.549  0.30( 0.29) 0.97    4727.3   50500.00
      2    17498.77   29.57    1.261  0.30( 0.29) 0.97    6588.9   30600.00
      3    19009.67   37.38    1.114  0.30( 0.29) 0.97    9298.4   21200.00
      4    20836.41   48.57    0.965  0.30( 0.29) 0.97   13680.8   21400.00
      5    21653.04   54.93    0.905  0.30( 0.29) 0.97   16481.6   31400.00
      6    22929.15   68.23    0.819  0.30( 0.29) 0.96   22078.9   13100.00
      7    23306.25   75.31    0.784  0.30( 0.29) 0.96   24570.4   11801.00
      8    24300.26   88.85    0.718  0.30( 0.29) 0.97   30148.6   11530.00
      9    25492.84  100.62    0.682  0.30( 0.29) 0.97   36643.9   13010.00
     10    26285.06  106.60    0.666  0.30( 0.29) 0.97   40266.8   11330.00
     11    26944.51  114.76    0.643  0.30( 0.29) 0.97   45351.3   10630.00
     12    26717.27  120.35    0.627  0.30( 0.29) 0.97   47945.2   12330.00
     13    26497.07  126.96    0.616  0.30( 0.29) 0.98   51083.8   11600.00
     14    26154.04  132.73    0.606  0.30( 0.29) 0.98   53316.2   11111.00
     15    25770.19  138.88    0.596  0.30( 0.29) 0.98   55252.5   12201.00
     16    24904.80  147.82    0.580  0.30( 0.29) 0.98   57340.2   12231.00
     17    24109.10  155.33    0.567  0.30( 0.29) 0.98   58753.5   10400.00
     18    22836.07  166.75    0.548  0.30( 0.29) 0.98   60370.7   10320.00
     19    22179.62  171.66    0.539  0.30( 0.29) 0.98   60598.6   10210.00
     20    21609.37  176.52    0.531  0.30( 0.29) 0.98   60760.0   12000.00
     21    18736.89  205.83    0.505  0.30( 0.29) 0.98   61377.8   10100.00
    TOTAL AREA(ACRES) =     61377.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    26944.51  Tc(MIN.) =  114.760
  EFFECTIVE AREA(ACRES) =  45351.34  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61377.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    209.00  DOWNSTREAM(FEET) =    207.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.35   CHANNEL SLOPE =  0.0051
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.48
  CHANNEL FLOW THRU SUBAREA(CFS) =   26944.51
  FLOW VELOCITY(FEET/SEC.) =  13.11   FLOW DEPTH(FEET) =   8.48
  TRAVEL TIME(MIN.) =   0.50   Tc(MIN.) =  115.26
```

```
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610506V.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       61.99   18.17  0.30( 0.30) 1.00      49.6   50600.00
   TOTAL AREA(ACRES) =       49.6

****************************************************************************
 FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    16184.92   21.62    1.525  0.30( 0.29) 0.97    4727.3   50500.00
     2    17498.77   30.16    1.246  0.30( 0.29) 0.97    6588.9   30600.00
     3    19009.67   37.95    1.104  0.30( 0.29) 0.97    9298.4   21200.00
     4    20836.41   49.12    0.958  0.30( 0.29) 0.97   13680.8   21400.00
     5    21653.04   55.47    0.900  0.30( 0.29) 0.97   16481.6   31400.00
     6    22929.15   68.76    0.817  0.30( 0.29) 0.96   22078.9   13100.00
     7    23306.25   75.84    0.782  0.30( 0.29) 0.96   24570.4   11801.00
     8    24300.26   89.37    0.715  0.30( 0.29) 0.97   30148.6   11530.00
     9    25492.84  101.14    0.681  0.30( 0.29) 0.97   36643.9   13010.00
    10    26285.06  107.11    0.664  0.30( 0.29) 0.97   40266.8   11330.00
    11    26944.51  115.26    0.641  0.30( 0.29) 0.97   45351.3   10630.00
    12    26717.27  120.86    0.627  0.30( 0.29) 0.97   47945.2   12330.00
    13    26497.07  127.46    0.615  0.30( 0.29) 0.98   51083.8   11600.00
    14    26154.04  133.24    0.605  0.30( 0.29) 0.98   53316.2   11111.00
    15    25770.19  139.39    0.595  0.30( 0.29) 0.98   55252.5   12201.00
    16    24904.80  148.33    0.579  0.30( 0.29) 0.98   57340.2   12231.00
    17    24109.10  155.85    0.566  0.30( 0.29) 0.98   58753.5   10400.00
    18    22836.07  167.28    0.547  0.30( 0.29) 0.98   60370.7   10320.00
    19    22179.62  172.20    0.538  0.30( 0.29) 0.98   60598.6   10210.00
    20    21609.37  177.06    0.530  0.30( 0.29) 0.98   60760.0   12000.00
    21    18736.89  206.40    0.505  0.30( 0.29) 0.98   61377.8   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       61.99   18.17    1.689  0.30( 0.30) 1.00      49.6   50600.00
 LONGEST FLOWPATH FROM NODE  50600.00 TO NODE  13404.00 =    4378.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    15478.31   18.17    1.689  0.30( 0.29) 0.98    4023.1   50600.00
     2    16239.58   21.62    1.525  0.30( 0.29) 0.98    4776.9   50500.00
     3    17541.00   30.16    1.246  0.30( 0.29) 0.97    6638.5   30600.00
```



```
     4    19045.54   37.95    1.104  0.30( 0.29) 0.97    9348.0   21200.00
     5    20865.80   49.12    0.958  0.30( 0.29) 0.97   13730.4   21400.00
     6    21679.81   55.47    0.900  0.30( 0.29) 0.97   16531.2   31400.00
     7    22952.21   68.76    0.817  0.30( 0.29) 0.96   22128.5   13100.00
     8    23327.76   75.84    0.782  0.30( 0.29) 0.96   24620.0   11801.00
     9    24318.79   89.37    0.715  0.30( 0.29) 0.97   30198.2   11530.00
    10    25509.84  101.14    0.681  0.30( 0.29) 0.97   36693.4   13010.00
    11    26301.31  107.11    0.664  0.30( 0.29) 0.97   40316.4   11330.00
    12    26959.74  115.26    0.641  0.30( 0.29) 0.97   45400.9   10630.00
    13    26731.85  120.86    0.627  0.30( 0.29) 0.97   47994.8   12330.00
    14    26511.14  127.46    0.615  0.30( 0.29) 0.98   51133.4   11600.00
    15    26167.67  133.24    0.605  0.30( 0.29) 0.98   53365.8   11111.00
    16    25783.35  139.39    0.595  0.30( 0.29) 0.98   55302.1   12201.00
    17    24917.27  148.33    0.579  0.30( 0.29) 0.98   57389.8   12231.00
    18    24121.00  155.85    0.566  0.30( 0.29) 0.98   58803.1   10400.00
    19    22847.09  167.28    0.547  0.30( 0.29) 0.98   60420.3   10320.00
    20    22190.26  172.20    0.538  0.30( 0.29) 0.98   60648.2   10210.00
    21    21619.64  177.06    0.530  0.30( 0.29) 0.98   60809.6   12000.00
    22    18746.03  206.40    0.505  0.30( 0.29) 0.98   61427.4   10100.00
  TOTAL AREA(ACRES) =     61427.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    26959.74  Tc(MIN.) =  115.263
 EFFECTIVE AREA(ACRES) =  45400.94  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    61427.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13404.00 TO NODE  13406.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    207.00  DOWNSTREAM(FEET) =    195.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1601.97   CHANNEL SLOPE =  0.0075
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.59
 CHANNEL FLOW THRU SUBAREA(CFS) =   26959.74
 FLOW VELOCITY(FEET/SEC.) =  14.94   FLOW DEPTH(FEET) =   7.59
 TRAVEL TIME(MIN.) =   1.79   Tc(MIN.) =  117.05
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610211V.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
    1      138.25   13.41  0.30( 0.30) 1.00      87.0   21100.00
  TOTAL AREA(ACRES) =       87.0

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    15478.31   20.33    1.577  0.30( 0.29) 0.98    4023.1   50600.00
      2    16239.58   23.74    1.439  0.30( 0.29) 0.98    4776.9   50500.00
      3    17541.00   32.23    1.208  0.30( 0.29) 0.97    6638.5   30600.00
      4    19045.54   39.96    1.067  0.30( 0.29) 0.97    9348.0   21200.00
      5    20865.80   51.07    0.939  0.30( 0.29) 0.97   13730.4   21400.00
      6    21679.81   57.40    0.883  0.30( 0.29) 0.97   16531.2   31400.00
      7    22952.21   70.65    0.807  0.30( 0.29) 0.96   22128.5   13100.00
      8    23327.76   77.72    0.773  0.30( 0.29) 0.96   24620.0   11801.00
      9    24318.79   91.22    0.709  0.30( 0.29) 0.97   30198.2   11530.00
     10    25509.84  102.96    0.676  0.30( 0.29) 0.97   36693.4   13010.00
     11    26301.31  108.91    0.659  0.30( 0.29) 0.97   40316.4   11330.00
     12    26959.74  117.05    0.636  0.30( 0.29) 0.97   45400.9   10630.00
     13    26731.85  122.65    0.623  0.30( 0.29) 0.97   47994.8   12330.00
     14    26511.14  129.26    0.612  0.30( 0.29) 0.98   51133.4   11600.00
     15    26167.67  135.05    0.602  0.30( 0.29) 0.98   53365.8   11111.00
     16    25783.35  141.20    0.592  0.30( 0.29) 0.98   55302.1   12201.00
     17    24917.27  150.17    0.576  0.30( 0.29) 0.98   57389.8   12231.00
     18    24121.00  157.71    0.563  0.30( 0.29) 0.98   58803.1   10400.00
     19    22847.09  169.17    0.544  0.30( 0.29) 0.98   60420.3   10320.00
     20    22190.26  174.11    0.535  0.30( 0.29) 0.98   60648.2   10210.00
     21    21619.64  178.98    0.527  0.30( 0.29) 0.98   60809.6   12000.00
     22    18746.03  208.42    0.503  0.30( 0.29) 0.98   61427.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      138.25   13.41    2.066  0.30( 0.30) 1.00      87.0   21100.00
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  13406.00 =    2859.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14241.22   13.41    2.066  0.30( 0.29) 0.98    2741.2   21100.00
      2    15578.25   20.33    1.577  0.30( 0.29) 0.98    4110.1   50600.00
      3    16328.73   23.74    1.439  0.30( 0.29) 0.98    4863.9   50500.00
      4    17612.11   32.23    1.208  0.30( 0.29) 0.98    6725.5   30600.00
      5    19105.57   39.96    1.067  0.30( 0.29) 0.97    9435.0   21200.00
      6    20915.79   51.07    0.939  0.30( 0.29) 0.97   13817.4   21400.00
      7    21725.45   57.40    0.883  0.30( 0.29) 0.97   16618.2   31400.00
      8    22991.95   70.65    0.807  0.30( 0.29) 0.96   22215.5   13100.00
      9    23364.76   77.72    0.773  0.30( 0.29) 0.96   24707.0   11801.00
     10    24350.78   91.22    0.709  0.30( 0.29) 0.97   30285.2   11530.00
     11    25539.26  102.96    0.676  0.30( 0.29) 0.97   36780.4   13010.00
     12    26329.43  108.91    0.659  0.30( 0.29) 0.97   40403.4   11330.00
```



```
     13    26986.07  117.05    0.636  0.30( 0.29) 0.97   45487.9   10630.00
     14    26757.17  122.65    0.623  0.30( 0.29) 0.97   48081.8   12330.00
     15    26535.58  129.26    0.612  0.30( 0.29) 0.98   51220.4   11600.00
     16    26191.33  135.05    0.602  0.30( 0.29) 0.98   53452.8   11111.00
     17    25806.18  141.20    0.592  0.30( 0.29) 0.98   55389.1   12201.00
     18    24938.90  150.17    0.576  0.30( 0.29) 0.98   57476.8   12231.00
     19    24141.61  157.71    0.563  0.30( 0.29) 0.98   58890.1   10400.00
     20    22866.17  169.17    0.544  0.30( 0.29) 0.98   60507.3   10320.00
     21    22208.67  174.11    0.535  0.30( 0.29) 0.98   60735.2   10210.00
     22    21637.40  178.98    0.527  0.30( 0.29) 0.98   60896.6   12000.00
     23    18761.93  208.42    0.503  0.30( 0.29) 0.98   61514.4   10100.00
   TOTAL AREA(ACRES) =     61514.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    26986.07  Tc(MIN.) =  117.050
  EFFECTIVE AREA(ACRES) =  45487.94  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61514.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13408.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    195.00  DOWNSTREAM(FEET) =    182.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2458.36   CHANNEL SLOPE =  0.0053
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.38
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.628
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       12.41      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   26987.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.31
  AVERAGE FLOW DEPTH(FEET) =   8.38   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =  120.13
  SUBAREA AREA(ACRES) =    12.41       SUBAREA RUNOFF(CFS) =    3.66
  EFFECTIVE AREA(ACRES) =  45500.35     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    61526.8         PEAK FLOW RATE(CFS) =   26986.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.38   FLOW VELOCITY(FEET/SEC.) =  13.31
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  12
----------------------------------------------------------------------------
```

```
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE = 15.1
--------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610507V.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      264.52   21.27  0.30( 0.30) 0.99     236.8   50700.00
    TOTAL AREA(ACRES) =      236.8

********************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14241.22   17.24    1.739  0.30( 0.29) 0.98    2753.6   21100.00
      2    15578.25   24.04    1.427  0.30( 0.29) 0.98    4122.5   50600.00
      3    16328.73   27.39    1.322  0.30( 0.29) 0.98    4876.3   50500.00
      4    17612.11   35.78    1.143  0.30( 0.29) 0.98    6737.9   30600.00
      5    19105.57   43.41    1.026  0.30( 0.29) 0.97    9447.4   21200.00
      6    20915.79   54.42    0.909  0.30( 0.29) 0.97   13829.8   21400.00
      7    21725.45   60.71    0.857  0.30( 0.29) 0.97   16630.6   31400.00
      8    22991.95   73.90    0.791  0.30( 0.29) 0.96   22227.9   13100.00
      9    23364.76   80.95    0.757  0.30( 0.29) 0.96   24719.4   11801.00
     10    24350.78   94.40    0.700  0.30( 0.29) 0.97   30297.6   11530.00
     11    25539.26  106.09    0.667  0.30( 0.29) 0.97   36792.9   13010.00
     12    26329.43  112.01    0.650  0.30( 0.29) 0.97   40415.8   11330.00
     13    26986.07  120.13    0.628  0.30( 0.29) 0.97   45500.4   10630.00
     14    26757.17  125.74    0.618  0.30( 0.29) 0.97   48094.2   12330.00
     15    26535.58  132.36    0.607  0.30( 0.29) 0.98   51232.8   11600.00
     16    26191.33  138.16    0.597  0.30( 0.29) 0.98   53465.2   11111.00
     17    25806.18  144.32    0.586  0.30( 0.29) 0.98   55401.5   12201.00
     18    24938.90  153.33    0.571  0.30( 0.29) 0.98   57489.2   12231.00
     19    24141.61  160.90    0.558  0.30( 0.29) 0.98   58902.5   10400.00
     20    22866.17  172.43    0.538  0.30( 0.29) 0.98   60519.7   10320.00
     21    22208.67  177.39    0.529  0.30( 0.29) 0.98   60747.6   10210.00
     22    21637.40  182.30    0.523  0.30( 0.29) 0.98   60909.0   12000.00
     23    18761.93  211.90    0.500  0.30( 0.29) 0.98   61526.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      264.52   21.27    1.539  0.30( 0.30) 0.99     236.8   50700.00
  LONGEST FLOWPATH FROM NODE  50700.00 TO NODE  13408.00 =    7903.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```



```
      1    14490.22   17.24    1.739  0.30( 0.29) 0.98    2945.5   21100.00
      2    15298.69   21.27    1.539  0.30( 0.29) 0.98    3802.3   50700.00
      3    15818.93   24.04    1.427  0.30( 0.29) 0.98    4359.3   50600.00
      4    16546.97   27.39    1.322  0.30( 0.29) 0.98    5113.0   50500.00
      5    17792.33   35.78    1.143  0.30( 0.29) 0.98    6974.7   30600.00
      6    19260.75   43.41    1.026  0.30( 0.29) 0.97    9684.2   21200.00
      7    21046.11   54.42    0.909  0.30( 0.29) 0.97   14066.6   21400.00
      8    21844.56   60.71    0.857  0.30( 0.29) 0.97   16867.4   31400.00
      9    23097.19   73.90    0.791  0.30( 0.29) 0.96   22464.7   13100.00
     10    23462.59   80.95    0.757  0.30( 0.29) 0.96   24956.2   11801.00
     11    24436.46   94.40    0.700  0.30( 0.29) 0.97   30534.4   11530.00
     12    25617.96  106.09    0.667  0.30( 0.29) 0.97   37029.6   13010.00
     13    26404.59  112.01    0.650  0.30( 0.29) 0.97   40652.6   11330.00
     14    27056.42  120.13    0.628  0.30( 0.29) 0.97   45737.1   10630.00
     15    26825.47  125.74    0.618  0.30( 0.29) 0.97   48331.0   12330.00
     16    26601.46  132.36    0.607  0.30( 0.29) 0.98   51469.6   11600.00
     17    26255.09  138.16    0.597  0.30( 0.29) 0.98   53702.0   11111.00
     18    25867.68  144.32    0.586  0.30( 0.29) 0.98   55638.3   12201.00
     19    24997.10  153.33    0.571  0.30( 0.29) 0.98   57726.0   12231.00
     20    24197.04  160.90    0.558  0.30( 0.29) 0.98   59139.3   10400.00
     21    22917.38  172.43    0.538  0.30( 0.29) 0.98   60756.5   10320.00
     22    22258.07  177.39    0.529  0.30( 0.29) 0.98   60984.4   10210.00
     23    21685.46  182.30    0.523  0.30( 0.29) 0.98   61145.8   12000.00
     24    18805.12  211.90    0.500  0.30( 0.29) 0.98   61763.6   10100.00
   TOTAL AREA(ACRES) =     61763.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    27056.42  Tc(MIN.) =  120.129
  EFFECTIVE AREA(ACRES) =  45737.14  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61763.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13408.00 TO NODE  13410.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    182.00  DOWNSTREAM(FEET) =    178.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =   952.73   CHANNEL SLOPE =  0.0034
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.625
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   27056.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.54
  AVERAGE FLOW DEPTH(FEET) =   9.48   TRAVEL TIME(MIN.) =   1.38
  Tc(MIN.) =  121.51
  SUBAREA AREA(ACRES) =     3.31       SUBAREA RUNOFF(CFS) =    0.97
  EFFECTIVE AREA(ACRES) =  45740.45     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
```

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  TOTAL AREA(ACRES) =    61766.9         PEAK FLOW RATE(CFS) =   27056.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.48   FLOW VELOCITY(FEET/SEC.) =  11.54
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13410.00 =  124122.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13410.00 TO NODE  13410.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13410.00 TO NODE  13410.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S36.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1788.02   21.81  0.30( 0.30) 0.99    1177.4   21000.00
      2     1852.70   24.87  0.30( 0.30) 0.99    1366.1   20810.00
      3     1861.46   25.23  0.30( 0.30) 0.99    1392.1   20900.00
      4     1915.23   28.11  0.30( 0.30) 0.99    1585.9   20800.00
      5     1939.27   30.39  0.30( 0.30) 0.99    1724.0   20700.00
      6     1952.20   38.63  0.30( 0.30) 0.99    2222.3   20600.00
      7     1933.26   45.32  0.30( 0.30) 0.99    2582.6   20500.00
      8     1917.21   48.00  0.30( 0.30) 0.99    2687.5   20400.00
      9     1909.07   48.50  0.30( 0.30) 0.99    2701.0   20300.00
     10     1858.18   51.54  0.30( 0.30) 0.99    2782.7   20200.00
     11     1858.15   51.54  0.30( 0.30) 0.99    2782.8   20210.00
     12     1823.24   53.55  0.30( 0.30) 0.99    2840.9   20100.00
     13     1760.66   58.80  0.30( 0.30) 0.99    2987.9   13600.00
     14     1491.76   99.88  0.30( 0.29) 0.98    3997.5   13510.00
     15     1380.84  111.11  0.30( 0.29) 0.97    4067.7   13500.00
    TOTAL AREA(ACRES) =     4067.7

****************************************************************************
  FLOW PROCESS FROM NODE  13410.00 TO NODE  13410.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14490.22   18.93    1.648  0.30( 0.29) 0.98    2948.8   21100.00
      2    15298.69   22.94    1.471  0.30( 0.29) 0.98    3805.6   50700.00
      3    15818.93   25.69    1.369  0.30( 0.29) 0.98    4362.6   50600.00
      4    16546.97   29.01    1.277  0.30( 0.29) 0.98    5116.4   50500.00
      5    17792.33   37.36    1.114  0.30( 0.29) 0.98    6978.0   30600.00
      6    19260.75   44.95    1.008  0.30( 0.29) 0.97    9687.5   21200.00
      7    21046.11   55.92    0.896  0.30( 0.29) 0.97   14069.9   21400.00
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      8    21844.56   62.19    0.849  0.30( 0.29) 0.97   16870.7   31400.00
      9    23097.19   75.35    0.784  0.30( 0.29) 0.96   22468.0   13100.00
     10    23462.59   82.39    0.750  0.30( 0.29) 0.96   24959.5   11801.00
     11    24436.46   95.83    0.696  0.30( 0.29) 0.97   30537.7   11530.00
     12    25617.96  107.49    0.663  0.30( 0.29) 0.97   37033.0   13010.00
     13    26404.59  113.40    0.646  0.30( 0.29) 0.97   40655.9   11330.00
     14    27056.42  121.51    0.625  0.30( 0.29) 0.97   45740.4   10630.00
     15    26825.47  127.12    0.616  0.30( 0.29) 0.97   48334.3   12330.00
     16    26601.46  133.74    0.604  0.30( 0.29) 0.98   51472.9   11600.00
     17    26255.09  139.55    0.594  0.30( 0.29) 0.98   53705.3   11111.00
     18    25867.68  145.72    0.584  0.30( 0.29) 0.98   55641.6   12201.00
     19    24997.10  154.74    0.568  0.30( 0.29) 0.98   57729.3   12231.00
     20    24197.04  162.33    0.555  0.30( 0.29) 0.98   59142.6   10400.00
     21    22917.38  173.88    0.536  0.30( 0.29) 0.98   60759.8   10320.00
     22    22258.07  178.86    0.527  0.30( 0.29) 0.98   60987.7   10210.00
     23    21685.46  183.78    0.522  0.30( 0.29) 0.98   61149.1   12000.00
     24    18805.12  213.46    0.499  0.30( 0.29) 0.98   61766.9   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13410.00 =  124122.09 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1788.02   21.81    1.517  0.30( 0.30) 0.99    1177.4   21000.00
    2     1852.70   24.87    1.393  0.30( 0.30) 0.99    1366.1   20810.00
    3     1861.46   25.23    1.382  0.30( 0.30) 0.99    1392.1   20900.00
    4     1915.23   28.11    1.301  0.30( 0.30) 0.99    1585.9   20800.00
    5     1939.27   30.39    1.242  0.30( 0.30) 0.99    1724.0   20700.00
    6     1952.20   38.63    1.091  0.30( 0.30) 0.99    2222.3   20600.00
    7     1933.26   45.32    1.003  0.30( 0.30) 0.99    2582.6   20500.00
    8     1917.21   48.00    0.972  0.30( 0.30) 0.99    2687.5   20400.00
    9     1909.07   48.50    0.966  0.30( 0.30) 0.99    2701.0   20300.00
   10     1858.18   51.54    0.934  0.30( 0.30) 0.99    2782.7   20200.00
   11     1858.15   51.54    0.934  0.30( 0.30) 0.99    2782.8   20210.00
   12     1823.24   53.55    0.917  0.30( 0.30) 0.99    2840.9   20100.00
   13     1760.66   58.80    0.871  0.30( 0.30) 0.99    2987.9   13600.00
   14     1491.76   99.88    0.684  0.30( 0.29) 0.98    3997.5   13510.00
   15     1380.84  111.11    0.653  0.30( 0.29) 0.97    4067.7   13500.00
LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13410.00 =   40827.58 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    16208.73   18.93    1.648  0.30( 0.29) 0.98    3971.1   21100.00
    2    16858.69   21.81    1.517  0.30( 0.29) 0.98    4741.4   21000.00
    3    17110.58   22.94    1.471  0.30( 0.29) 0.98    5052.6   50700.00
    4    17516.71   24.87    1.393  0.30( 0.29) 0.98    5562.8   20810.00
    5    17593.96   25.23    1.382  0.30( 0.29) 0.98    5662.1   20900.00
    6    17688.91   25.69    1.369  0.30( 0.29) 0.98    5785.4   50600.00
    7    18265.70   28.11    1.301  0.30( 0.29) 0.98    6498.8   20800.00
    8    18471.69   29.01    1.277  0.30( 0.29) 0.98    6756.7   50500.00
    9    18691.54   30.39    1.242  0.30( 0.29) 0.98    7147.2   20700.00
   10    19742.55   37.36    1.114  0.30( 0.29) 0.98    9123.7   30600.00
   11    19989.60   38.63    1.091  0.30( 0.29) 0.98    9652.5   20600.00
   12    21195.04   44.95    1.008  0.30( 0.29) 0.98   12250.6   21200.00
   13    21253.21   45.32    1.003  0.30( 0.29) 0.98   12415.5   20500.00
   14    21673.34   48.00    0.972  0.30( 0.29) 0.98   13591.0   20400.00
   15    21746.78   48.50    0.966  0.30( 0.29) 0.98   13804.8   20300.00
   16    22191.28   51.54    0.934  0.30( 0.29) 0.97   15102.4   20200.00
```

17	22191.59	51.54	0.934	0.30(0.29)	0.97	15103.3	20210.00
18	22484.74	53.55	0.917	0.30(0.29)	0.97	15966.8	20100.00
19	22841.18	55.92	0.896	0.30(0.29)	0.97	16977.0	21400.00
20	23174.02	58.80	0.871	0.30(0.29)	0.97	18346.0	13600.00
21	23583.06	62.19	0.849	0.30(0.29)	0.97	19941.8	31400.00
22	24749.53	75.35	0.784	0.30(0.29)	0.97	25862.6	13100.00
23	25068.83	82.39	0.750	0.30(0.29)	0.97	28527.1	11801.00
24	25954.72	95.83	0.696	0.30(0.29)	0.97	34435.6	11530.00
25	26338.35	99.88	0.684	0.30(0.29)	0.97	36789.9	13510.00
26	27034.53	107.49	0.663	0.30(0.29)	0.97	41078.1	13010.00
27	27480.41	111.11	0.653	0.30(0.29)	0.97	43318.8	13500.00
28	27760.87	113.40	0.646	0.30(0.29)	0.97	44723.6	11330.00
29	28332.09	121.51	0.625	0.30(0.29)	0.97	49808.2	10630.00
30	28064.26	127.12	0.616	0.30(0.29)	0.97	52402.0	12330.00
31	27796.71	133.74	0.604	0.30(0.29)	0.98	55540.7	11600.00
32	27412.21	139.55	0.594	0.30(0.29)	0.98	57773.1	11111.00
33	26984.21	145.72	0.584	0.30(0.29)	0.98	59709.3	12201.00
34	26054.35	154.74	0.568	0.30(0.29)	0.98	61797.0	12231.00
35	25204.44	162.33	0.555	0.30(0.29)	0.98	63210.3	10400.00
36	23848.86	173.88	0.536	0.30(0.29)	0.98	64827.5	10320.00
37	23156.82	178.86	0.527	0.30(0.29)	0.98	65055.4	10210.00
38	22565.56	183.78	0.522	0.30(0.29)	0.98	65216.9	12000.00
39	19597.48	213.46	0.499	0.30(0.29)	0.98	65834.6	10100.00

TOTAL AREA(ACRES) = 65834.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 28332.09 Tc(MIN.) = 121.505
EFFECTIVE AREA(ACRES) = 49808.18 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 65834.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13412.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 178.72 DOWNSTREAM(FEET) = 176.93
CHANNEL LENGTH THRU SUBAREA(FEET) = 169.78 CHANNEL SLOPE = 0.0105
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.08
CHANNEL FLOW THRU SUBAREA(CFS) = 28332.09
FLOW VELOCITY(FEET/SEC.) = 17.01 FLOW DEPTH(FEET) = 7.08
TRAVEL TIME(MIN.) = 0.17 Tc(MIN.) = 121.67
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<

==========
PEAK FLOWRATE TABLE FILE NAME: 0509101V.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	409.44	39.42	0.30(0.30)	1.00	585.7	10100.00

TOTAL AREA(ACRES) = 585.7

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16208.73	19.14	1.637	0.30(0.29)	0.98	3971.1	21100.00
2	16858.69	22.01	1.509	0.30(0.29)	0.98	4741.4	21000.00
3	17110.58	23.13	1.463	0.30(0.29)	0.98	5052.6	50700.00
4	17516.71	25.06	1.386	0.30(0.29)	0.98	5562.8	20810.00
5	17593.96	25.42	1.376	0.30(0.29)	0.98	5662.1	20900.00
6	17688.91	25.88	1.364	0.30(0.29)	0.98	5785.4	50600.00
7	18265.70	28.31	1.296	0.30(0.29)	0.98	6498.8	20800.00
8	18471.69	29.20	1.271	0.30(0.29)	0.98	6756.7	50500.00
9	18691.54	30.58	1.238	0.30(0.29)	0.98	7147.2	20700.00
10	19742.55	37.55	1.111	0.30(0.29)	0.98	9123.7	30600.00
11	19989.60	38.82	1.088	0.30(0.29)	0.98	9652.5	20600.00
12	21195.04	45.14	1.005	0.30(0.29)	0.98	12250.6	21200.00
13	21253.21	45.50	1.001	0.30(0.29)	0.98	12415.5	20500.00
14	21673.34	48.18	0.970	0.30(0.29)	0.98	13591.0	20400.00
15	21746.78	48.68	0.964	0.30(0.29)	0.98	13804.8	20300.00
16	22191.28	51.72	0.933	0.30(0.29)	0.97	15102.4	20200.00
17	22191.59	51.72	0.933	0.30(0.29)	0.97	15103.3	20210.00
18	22484.74	53.73	0.915	0.30(0.29)	0.97	15966.8	20100.00
19	22841.18	56.10	0.894	0.30(0.29)	0.97	16977.0	21400.00
20	23174.02	58.98	0.869	0.30(0.29)	0.97	18346.0	13600.00
21	23583.06	62.36	0.848	0.30(0.29)	0.97	19941.8	31400.00
22	24749.53	75.52	0.783	0.30(0.29)	0.97	25862.6	13100.00
23	25068.83	82.56	0.749	0.30(0.29)	0.97	28527.1	11801.00
24	25954.72	96.00	0.695	0.30(0.29)	0.97	34435.6	11530.00
25	26338.35	100.05	0.684	0.30(0.29)	0.97	36789.9	13510.00
26	27034.53	107.66	0.663	0.30(0.29)	0.97	41078.1	13010.00
27	27480.41	111.28	0.652	0.30(0.29)	0.97	43318.8	13500.00
28	27760.87	113.57	0.646	0.30(0.29)	0.97	44723.6	11330.00
29	28332.09	121.67	0.625	0.30(0.29)	0.97	49808.2	10630.00
30	28064.26	127.28	0.615	0.30(0.29)	0.97	52402.0	12330.00
31	27796.71	133.91	0.604	0.30(0.29)	0.98	55540.7	11600.00
32	27412.21	139.71	0.594	0.30(0.29)	0.98	57773.1	11111.00
33	26984.21	145.89	0.584	0.30(0.29)	0.98	59709.3	12201.00
34	26054.35	154.91	0.568	0.30(0.29)	0.98	61797.0	12231.00
35	25204.44	162.50	0.555	0.30(0.29)	0.98	63210.3	10400.00
36	23848.86	174.06	0.535	0.30(0.29)	0.98	64827.5	10320.00
37	23156.82	179.04	0.527	0.30(0.29)	0.98	65055.4	10210.00
38	22565.56	183.96	0.522	0.30(0.29)	0.98	65216.9	12000.00
39	19597.48	213.65	0.499	0.30(0.29)	0.98	65834.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	409.44	39.42	1.077	0.30(0.30)	1.00	585.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 14724.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16550.80	19.14	1.637	0.30(0.29)	0.98	4255.4	21100.00
2	17214.49	22.01	1.509	0.30(0.29)	0.98	5068.3	21000.00
3	17470.52	23.13	1.463	0.30(0.29)	0.98	5396.3	50700.00
4	17880.80	25.06	1.386	0.30(0.29)	0.98	5935.2	20810.00
5	17959.89	25.42	1.376	0.30(0.29)	0.98	6039.9	20900.00
6	18057.02	25.88	1.364	0.30(0.29)	0.98	6169.9	50600.00
7	18642.78	28.31	1.296	0.30(0.29)	0.98	6919.4	20800.00
8	18850.99	29.20	1.271	0.30(0.29)	0.98	7190.6	50500.00
9	19075.31	30.58	1.238	0.30(0.29)	0.98	7601.6	20700.00
10	20149.75	37.55	1.111	0.30(0.29)	0.98	9681.6	30600.00
11	20398.50	38.82	1.088	0.30(0.29)	0.98	10229.2	20600.00
12	20514.38	39.42	1.077	0.30(0.29)	0.98	10486.8	10100.00
13	21566.94	45.14	1.005	0.30(0.29)	0.98	12836.3	21200.00
14	21622.85	45.50	1.001	0.30(0.29)	0.98	13001.2	20500.00
15	22026.33	48.18	0.970	0.30(0.29)	0.98	14176.8	20400.00
16	22096.65	48.68	0.964	0.30(0.29)	0.98	14390.5	20300.00
17	22524.96	51.72	0.933	0.30(0.29)	0.97	15688.2	20200.00
18	22525.25	51.72	0.933	0.30(0.29)	0.97	15689.1	20210.00
19	22809.06	53.73	0.915	0.30(0.29)	0.97	16552.5	20100.00
20	23154.54	56.10	0.894	0.30(0.29)	0.97	17562.7	21400.00
21	23474.01	58.98	0.869	0.30(0.29)	0.97	18931.8	13600.00
22	23872.17	62.36	0.848	0.30(0.29)	0.97	20527.6	31400.00
23	25004.42	75.52	0.783	0.30(0.29)	0.97	26448.3	13100.00
24	25305.41	82.56	0.749	0.30(0.29)	0.97	29112.8	11801.00
25	26163.10	96.00	0.695	0.30(0.29)	0.97	35021.4	11530.00
26	26540.75	100.05	0.684	0.30(0.29)	0.97	37375.6	13510.00
27	27225.69	107.66	0.663	0.30(0.29)	0.97	41663.8	13010.00
28	27666.23	111.28	0.652	0.30(0.29)	0.97	43904.5	13500.00
29	27943.31	113.57	0.646	0.30(0.29)	0.97	45309.3	11330.00
30	28503.53	121.67	0.625	0.30(0.29)	0.97	50393.9	10630.00
31	28230.62	127.28	0.615	0.30(0.29)	0.97	52987.7	12330.00
32	27957.08	133.91	0.604	0.30(0.29)	0.98	56126.4	11600.00
33	27567.31	139.71	0.594	0.30(0.29)	0.98	58358.8	11111.00
34	27133.73	145.89	0.584	0.30(0.29)	0.98	60295.0	12201.00
35	26195.70	154.91	0.568	0.30(0.29)	0.98	62382.7	12231.00
36	25338.92	162.50	0.555	0.30(0.29)	0.98	63796.1	10400.00
37	23972.89	174.06	0.535	0.30(0.29)	0.98	65413.3	10320.00
38	23276.35	179.04	0.527	0.30(0.29)	0.98	65641.2	10210.00
39	22682.60	183.96	0.522	0.30(0.29)	0.98	65802.6	12000.00
40	19702.44	213.65	0.499	0.30(0.29)	0.98	66420.4	10100.00

TOTAL AREA(ACRES) = 66420.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 28503.53 Tc(MIN.) = 121.671
EFFECTIVE AREA(ACRES) = 50393.91 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 66420.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

FLOW PROCESS FROM NODE 13412.00 TO NODE 13700.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 176.93 DOWNSTREAM(FEET) = 173.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 260.10 CHANNEL SLOPE = 0.0151
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.40
CHANNEL FLOW THRU SUBAREA(CFS) = 28503.53
FLOW VELOCITY(FEET/SEC.) = 19.20 FLOW DEPTH(FEET) = 6.40
TRAVEL TIME(MIN.) = 0.23 Tc(MIN.) = 121.90
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610508V.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	143.78	21.90	0.30(0.30)	0.99	131.3	50800.00

TOTAL AREA(ACRES) = 131.3

FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16550.80	19.41	1.622	0.30(0.29)	0.98	4255.4	21100.00
2	17214.49	22.28	1.498	0.30(0.29)	0.98	5068.3	21000.00
3	17470.52	23.40	1.453	0.30(0.29)	0.98	5396.3	50700.00
4	17880.80	25.33	1.379	0.30(0.29)	0.98	5935.2	20810.00
5	17959.89	25.69	1.369	0.30(0.29)	0.98	6039.9	20900.00
6	18057.02	26.15	1.356	0.30(0.29)	0.98	6169.9	50600.00
7	18642.78	28.57	1.289	0.30(0.29)	0.98	6919.4	20800.00
8	18850.99	29.46	1.264	0.30(0.29)	0.98	7190.6	50500.00
9	19075.31	30.84	1.234	0.30(0.29)	0.98	7601.6	20700.00
10	20149.75	37.81	1.106	0.30(0.29)	0.98	9681.6	30600.00
11	20398.50	39.07	1.083	0.30(0.29)	0.98	10229.2	20600.00
12	20514.38	39.67	1.072	0.30(0.29)	0.98	10486.8	10100.00
13	21566.94	45.39	1.002	0.30(0.29)	0.98	12836.3	21200.00
14	21622.85	45.75	0.998	0.30(0.29)	0.98	13001.2	20500.00
15	22026.33	48.42	0.967	0.30(0.29)	0.98	14176.8	20400.00

16	22096.65	48.92	0.961	0.30(0.29)	0.98	14390.5	20300.00
17	22524.96	51.96	0.931	0.30(0.29)	0.97	15688.2	20200.00
18	22525.25	51.97	0.931	0.30(0.29)	0.97	15689.1	20210.00
19	22809.06	53.98	0.913	0.30(0.29)	0.97	16552.5	20100.00
20	23154.54	56.34	0.892	0.30(0.29)	0.97	17562.7	21400.00
21	23474.01	59.22	0.867	0.30(0.29)	0.97	18931.8	13600.00
22	23872.17	62.60	0.847	0.30(0.29)	0.97	20527.6	31400.00
23	25004.42	75.76	0.782	0.30(0.29)	0.97	26448.3	13100.00
24	25305.41	82.80	0.748	0.30(0.29)	0.97	29112.8	11801.00
25	26163.10	96.23	0.695	0.30(0.29)	0.97	35021.4	11530.00
26	26540.75	100.28	0.683	0.30(0.29)	0.97	37375.6	13510.00
27	27225.69	107.89	0.662	0.30(0.29)	0.97	41663.8	13010.00
28	27666.23	111.51	0.652	0.30(0.29)	0.97	43904.5	13500.00
29	27943.31	113.80	0.645	0.30(0.29)	0.97	45309.3	11330.00
30	28503.53	121.90	0.625	0.30(0.29)	0.97	50393.9	10630.00
31	28230.62	127.51	0.615	0.30(0.29)	0.97	52987.7	12330.00
32	27957.08	134.14	0.604	0.30(0.29)	0.98	56126.4	11600.00
33	27567.31	139.94	0.594	0.30(0.29)	0.98	58358.8	11111.00
34	27133.73	146.12	0.583	0.30(0.29)	0.98	60295.0	12201.00
35	26195.70	155.15	0.568	0.30(0.29)	0.98	62382.7	12231.00
36	25338.92	162.74	0.555	0.30(0.29)	0.98	63796.1	10400.00
37	23972.89	174.30	0.535	0.30(0.29)	0.98	65413.3	10320.00
38	23276.35	179.28	0.526	0.30(0.29)	0.98	65641.2	10210.00
39	22682.60	184.20	0.522	0.30(0.29)	0.98	65802.6	12000.00
40	19702.44	213.90	0.499	0.30(0.29)	0.98	66420.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	143.78	21.90	1.513	0.30(0.30)	0.99	131.3	50800.00

LONGEST FLOWPATH FROM NODE 50800.00 TO NODE 13700.00 = 5946.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16689.61	19.41	1.622	0.30(0.29)	0.98	4371.7	21100.00
2	17271.72	21.90	1.513	0.30(0.29)	0.98	5093.6	50800.00
3	17356.49	22.28	1.498	0.30(0.29)	0.98	5199.6	21000.00
4	17607.14	23.40	1.453	0.30(0.29)	0.98	5527.6	50700.00
5	18008.71	25.33	1.379	0.30(0.29)	0.98	6066.5	20810.00
6	18086.61	25.69	1.369	0.30(0.29)	0.98	6171.2	20900.00
7	18182.24	26.15	1.356	0.30(0.29)	0.98	6301.2	50600.00
8	18760.05	28.57	1.289	0.30(0.29)	0.98	7050.6	20800.00
9	18965.31	29.46	1.264	0.30(0.29)	0.98	7321.9	50500.00
10	19186.06	30.84	1.234	0.30(0.29)	0.98	7732.8	20700.00
11	20245.44	37.81	1.106	0.30(0.29)	0.98	9812.9	30600.00
12	20491.45	39.07	1.083	0.30(0.29)	0.98	10360.5	20600.00
13	20606.02	39.67	1.072	0.30(0.29)	0.98	10618.1	10100.00
14	21650.37	45.39	1.002	0.30(0.29)	0.98	12967.6	21200.00
15	21705.77	45.75	0.998	0.30(0.29)	0.98	13132.5	20500.00
16	22105.52	48.42	0.967	0.30(0.29)	0.98	14308.0	20400.00
17	22175.14	48.92	0.961	0.30(0.29)	0.98	14521.8	20300.00
18	22599.91	51.96	0.931	0.30(0.29)	0.97	15819.4	20200.00
19	22600.20	51.97	0.931	0.30(0.29)	0.97	15820.3	20210.00
20	22881.91	53.98	0.913	0.30(0.29)	0.97	16683.8	20100.00
21	23224.95	56.34	0.892	0.30(0.29)	0.97	17694.0	21400.00
22	23541.42	59.22	0.867	0.30(0.29)	0.97	19063.0	13600.00

23	23937.24	62.60	0.847	0.30(0.29)	0.97	20658.8	31400.00
24	25061.83	75.76	0.782	0.30(0.29)	0.97	26579.5	13100.00
25	25358.71	82.80	0.748	0.30(0.29)	0.97	29244.1	11801.00
26	26210.14	96.23	0.695	0.30(0.29)	0.97	35152.6	11530.00
27	26586.46	100.28	0.683	0.30(0.29)	0.97	37506.9	13510.00
28	27268.87	107.89	0.662	0.30(0.29)	0.97	41795.0	13010.00
29	27708.22	111.51	0.652	0.30(0.29)	0.97	44035.8	13500.00
30	27984.54	113.80	0.645	0.30(0.29)	0.97	45440.6	11330.00
31	28542.32	121.90	0.625	0.30(0.29)	0.97	50525.2	10630.00
32	28268.28	127.51	0.615	0.30(0.29)	0.98	53119.0	12330.00
33	27993.39	134.14	0.604	0.30(0.29)	0.98	56257.6	11600.00
34	27602.45	139.94	0.594	0.30(0.29)	0.98	58490.1	11111.00
35	27167.61	146.12	0.583	0.30(0.29)	0.98	60426.3	12201.00
36	26227.75	155.15	0.568	0.30(0.29)	0.98	62514.0	12231.00
37	25369.43	162.74	0.555	0.30(0.29)	0.98	63927.3	10400.00
38	24001.05	174.30	0.535	0.30(0.29)	0.98	65544.5	10320.00
39	23303.50	179.28	0.526	0.30(0.29)	0.98	65772.4	10210.00
40	22709.22	184.20	0.522	0.30(0.29)	0.98	65933.9	12000.00
41	19726.35	213.90	0.499	0.30(0.29)	0.98	66551.6	10100.00

TOTAL AREA(ACRES) = 66551.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 28542.32 Tc(MIN.) = 121.897
EFFECTIVE AREA(ACRES) = 50525.18 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 66551.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 66551.6 TC(MIN.) = 121.90
EFFECTIVE AREA(ACRES) = 50525.18 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.974
PEAK FLOW RATE(CFS) = 28542.32

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16689.61	19.41	1.622	0.30(0.29)	0.98	4371.7	21100.00
2	17271.72	21.90	1.513	0.30(0.29)	0.98	5093.6	50800.00
3	17356.49	22.28	1.498	0.30(0.29)	0.98	5199.6	21000.00
4	17607.14	23.40	1.453	0.30(0.29)	0.98	5527.6	50700.00
5	18008.71	25.33	1.379	0.30(0.29)	0.98	6066.5	20810.00
6	18086.61	25.69	1.369	0.30(0.29)	0.98	6171.2	20900.00
7	18182.24	26.15	1.356	0.30(0.29)	0.98	6301.2	50600.00
8	18760.05	28.57	1.289	0.30(0.29)	0.98	7050.6	20800.00
9	18965.31	29.46	1.264	0.30(0.29)	0.98	7321.9	50500.00
10	19186.06	30.84	1.234	0.30(0.29)	0.98	7732.8	20700.00
11	20245.44	37.81	1.106	0.30(0.29)	0.98	9812.9	30600.00
12	20491.45	39.07	1.083	0.30(0.29)	0.98	10360.5	20600.00
13	20606.02	39.67	1.072	0.30(0.29)	0.98	10618.1	10100.00
14	21650.37	45.39	1.002	0.30(0.29)	0.98	12967.6	21200.00
15	21705.77	45.75	0.998	0.30(0.29)	0.98	13132.5	20500.00
16	22105.52	48.42	0.967	0.30(0.29)	0.98	14308.0	20400.00
17	22175.14	48.92	0.961	0.30(0.29)	0.98	14521.8	20300.00
18	22599.91	51.96	0.931	0.30(0.29)	0.97	15819.4	20200.00
19	22600.20	51.97	0.931	0.30(0.29)	0.97	15820.3	20210.00
20	22881.91	53.98	0.913	0.30(0.29)	0.97	16683.8	20100.00
21	23224.95	56.34	0.892	0.30(0.29)	0.97	17694.0	21400.00

22	23541.42	59.22	0.867	0.30(0.29)	0.97	19063.0	13600.00
23	23937.24	62.60	0.847	0.30(0.29)	0.97	20658.8	31400.00
24	25061.83	75.76	0.782	0.30(0.29)	0.97	26579.5	13100.00
25	25358.71	82.80	0.748	0.30(0.29)	0.97	29244.1	11801.00
26	26210.14	96.23	0.695	0.30(0.29)	0.97	35152.6	11530.00
27	26586.46	100.28	0.683	0.30(0.29)	0.97	37506.9	13510.00
28	27268.87	107.89	0.662	0.30(0.29)	0.97	41795.0	13010.00
29	27708.22	111.51	0.652	0.30(0.29)	0.97	44035.8	13500.00
30	27984.54	113.80	0.645	0.30(0.29)	0.97	45440.6	11330.00
31	28542.32	121.90	0.625	0.30(0.29)	0.97	50525.2	10630.00
32	28268.28	127.51	0.615	0.30(0.29)	0.98	53119.0	12330.00
33	27993.39	134.14	0.604	0.30(0.29)	0.98	56257.6	11600.00
34	27602.45	139.94	0.594	0.30(0.29)	0.98	58490.1	11111.00
35	27167.61	146.12	0.583	0.30(0.29)	0.98	60426.3	12201.00
36	26227.75	155.15	0.568	0.30(0.29)	0.98	62514.0	12231.00
37	25369.43	162.74	0.555	0.30(0.29)	0.98	63927.3	10400.00
38	24001.05	174.30	0.535	0.30(0.29)	0.98	65544.5	10320.00
39	23303.50	179.28	0.526	0.30(0.29)	0.98	65772.4	10210.00
40	22709.22	184.20	0.522	0.30(0.29)	0.98	65933.9	12000.00
41	19726.35	213.90	0.499	0.30(0.29)	0.98	66551.6	10100.00

END OF RATIONAL METHOD ANALYSIS

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************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S35.DAT
  TIME/DATE OF STUDY: 13:51 04/03/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.120
   2)   10.00;  2.158
   3)   15.00;  1.718
   4)   20.00;  1.461
   5)   25.00;  1.289
   6)   30.00;  1.180
   7)   40.00;  0.990
   8)   50.00;  0.873
   9)   60.00;  0.780
  10)   90.00;  0.628
  11)  120.00;  0.534
  12)  180.00;  0.437
  13)  360.00;  0.302
  14) 1440.00;  0.126
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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************************************************************************
  FLOW PROCESS FROM NODE  13500.00 TO NODE  13500.50 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   548.43
  ELEVATION DATA: UPSTREAM(FEET) =   1183.47  DOWNSTREAM(FEET) =   1065.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.955
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.986
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        5.11      0.30     1.000     0   11.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.75
  TOTAL AREA(ACRES) =      5.11   PEAK FLOW RATE(CFS) =      7.75

************************************************************************
  FLOW PROCESS FROM NODE  13500.50 TO NODE  13501.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1065.00  DOWNSTREAM(FEET) =   1033.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =   431.71   CHANNEL SLOPE =  0.0738
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.795
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.32
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   2.17
  Tc(MIN.) =   14.12
  SUBAREA AREA(ACRES) =     8.87       SUBAREA RUNOFF(CFS) =   11.94
  EFFECTIVE AREA(ACRES) =     13.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.0          PEAK FLOW RATE(CFS) =      18.81
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   3.74
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13501.00 =     980.14 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  13501.00 TO NODE  13502.00 IS CODE =  56
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1033.15  DOWNSTREAM(FEET) =    990.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.63   CHANNEL SLOPE =  0.0452
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.543
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.69
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   4.28
  Tc(MIN.) =   18.40
  SUBAREA AREA(ACRES) =    16.82       SUBAREA RUNOFF(CFS) =   18.82
  EFFECTIVE AREA(ACRES) =     30.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       30.8         PEAK FLOW RATE(CFS) =      34.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   3.95
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13502.00 =    1928.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13502.00 TO NODE  13503.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.26  DOWNSTREAM(FEET) =    956.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.98   CHANNEL SLOPE =  0.0363
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.392
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.36
  AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   3.60
  Tc(MIN.) =   22.00
  SUBAREA AREA(ACRES) =    46.02       SUBAREA RUNOFF(CFS) =   45.24
  EFFECTIVE AREA(ACRES) =     76.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.8         PEAK FLOW RATE(CFS) =      75.51
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   4.77
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13503.00 =    2869.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13503.00 TO NODE  13504.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    956.06  DOWNSTREAM(FEET) =    889.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2131.31   CHANNEL SLOPE =  0.0312
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.58
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.197
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      99.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.93
  AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   7.20
  Tc(MIN.) =   29.21
  SUBAREA AREA(ACRES) =    58.46       SUBAREA RUNOFF(CFS) =   47.21
  EFFECTIVE AREA(ACRES) =    135.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      135.3         PEAK FLOW RATE(CFS) =     109.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.63   FLOW VELOCITY(FEET/SEC.) =   5.06
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13504.00 =    5001.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13504.00 TO NODE  13505.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    889.48  DOWNSTREAM(FEET) =    848.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1661.97   CHANNEL SLOPE =  0.0249
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.088
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       49.30      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     126.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.90
  AVERAGE FLOW DEPTH(FEET) =   1.88   TRAVEL TIME(MIN.) =   5.65
  Tc(MIN.) =   34.86
  SUBAREA AREA(ACRES) =    49.30       SUBAREA RUNOFF(CFS) =   34.95
  EFFECTIVE AREA(ACRES) =    184.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      184.6         PEAK FLOW RATE(CFS) =     130.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.91   FLOW VELOCITY(FEET/SEC.) =   4.95
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.00 =    6663.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.00 TO NODE  13505.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    848.10  DOWNSTREAM(FEET) =    811.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1234.61   CHANNEL SLOPE =  0.0300
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.92
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.016
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.35      0.30     0.811     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.811
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     144.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.44
  AVERAGE FLOW DEPTH(FEET) =   1.92   TRAVEL TIME(MIN.) =   3.78
  Tc(MIN.) =   38.64
  SUBAREA AREA(ACRES) =    39.35       SUBAREA RUNOFF(CFS) =   27.36
  EFFECTIVE AREA(ACRES) =    223.93     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      223.9         PEAK FLOW RATE(CFS) =     146.28
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   5.46
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.50 =    7897.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.50 TO NODE  13506.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    811.10  DOWNSTREAM(FEET) =    781.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1415.98   CHANNEL SLOPE =  0.0213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.26
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.951
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.33      0.30     0.738     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.738
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     164.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.00
  AVERAGE FLOW DEPTH(FEET) =   2.26   TRAVEL TIME(MIN.) =   4.72
  Tc(MIN.) =   43.36
  SUBAREA AREA(ACRES) =    54.33       SUBAREA RUNOFF(CFS) =   35.66
  EFFECTIVE AREA(ACRES) =    278.26     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =      278.3         PEAK FLOW RATE(CFS) =     168.81
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.29   FLOW VELOCITY(FEET/SEC.) =   5.05
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.00 =    9313.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13506.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    781.00  DOWNSTREAM(FEET) =    743.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1542.62   CHANNEL SLOPE =  0.0245
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.896
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.33      0.30     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     187.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.47
  AVERAGE FLOW DEPTH(FEET) =   2.33   TRAVEL TIME(MIN.) =   4.70
  Tc(MIN.) =   48.06
  SUBAREA AREA(ACRES) =    61.33       SUBAREA RUNOFF(CFS) =   36.47
  EFFECTIVE AREA(ACRES) =    339.59     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =      339.6         PEAK FLOW RATE(CFS) =     191.51
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.36
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.36   FLOW VELOCITY(FEET/SEC.) =   5.51
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.50 =   10856.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.50 TO NODE  13520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    743.17  DOWNSTREAM(FEET) =    717.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1370.93   CHANNEL SLOPE =  0.0191
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.60
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.849
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.86      0.30     0.848     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.848
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     202.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.12
  AVERAGE FLOW DEPTH(FEET) =   2.60   TRAVEL TIME(MIN.) =   4.46
  Tc(MIN.) =   52.53
  SUBAREA AREA(ACRES) =    39.86       SUBAREA RUNOFF(CFS) =   21.35
  EFFECTIVE AREA(ACRES) =    379.45     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =      379.5         PEAK FLOW RATE(CFS) =     198.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.58   FLOW VELOCITY(FEET/SEC.) =   5.09
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   52.53
  RAINFALL INTENSITY(INCH/HR) =   0.85
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     379.45
  TOTAL STREAM AREA(ACRES) =     379.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     198.76

****************************************************************************
  FLOW PROCESS FROM NODE  13510.00 TO NODE  13511.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```



```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   903.68
  ELEVATION DATA: UPSTREAM(FEET) =   1216.90  DOWNSTREAM(FEET) =   1022.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.615
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.752
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.30     1.000     0   14.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.70
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =      8.70

****************************************************************************
  FLOW PROCESS FROM NODE  13511.00 TO NODE  13512.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1022.78  DOWNSTREAM(FEET) =    954.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1027.63   CHANNEL SLOPE =  0.0667
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.56
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.510
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       25.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.87
  AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =   4.43
  Tc(MIN.) =   19.04
  SUBAREA AREA(ACRES) =    25.40       SUBAREA RUNOFF(CFS) =   27.67
  EFFECTIVE AREA(ACRES) =     32.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       32.1         PEAK FLOW RATE(CFS) =      34.92
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   4.51
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13512.00 =    1931.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13512.00 TO NODE  13513.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    954.27  DOWNSTREAM(FEET) =    872.45
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.42   CHANNEL SLOPE =  0.0425
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.279
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       90.23      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.02
 AVERAGE FLOW DEPTH(FEET) =   1.20   TRAVEL TIME(MIN.) =   6.40
 Tc(MIN.) =   25.44
 SUBAREA AREA(ACRES) =    90.23       SUBAREA RUNOFF(CFS) =   79.55
 EFFECTIVE AREA(ACRES) =    122.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      122.3         PEAK FLOW RATE(CFS) =     107.81
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   5.61
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13513.00 =    3857.73 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13513.00 TO NODE  13514.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    872.45  DOWNSTREAM(FEET) =    813.12
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1895.66   CHANNEL SLOPE =  0.0313
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.06
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.161
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      135.65      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     160.48
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.70
 AVERAGE FLOW DEPTH(FEET) =   2.01   TRAVEL TIME(MIN.) =   5.55
 Tc(MIN.) =   30.98
 SUBAREA AREA(ACRES) =   135.65       SUBAREA RUNOFF(CFS) =  105.17
 EFFECTIVE AREA(ACRES) =    257.94     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      257.9         PEAK FLOW RATE(CFS) =     199.97
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.26
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.26   FLOW VELOCITY(FEET/SEC.) =   6.08
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13514.00 =    5753.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13514.00 TO NODE  13515.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    813.12  DOWNSTREAM(FEET) =    773.74
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.15   CHANNEL SLOPE =  0.0204
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.81
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.050
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      109.30      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     236.91
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.48
 AVERAGE FLOW DEPTH(FEET) =   2.78   TRAVEL TIME(MIN.) =   5.86
 Tc(MIN.) =   36.84
 SUBAREA AREA(ACRES) =   109.30       SUBAREA RUNOFF(CFS) =   73.78
 EFFECTIVE AREA(ACRES) =    367.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      367.2         PEAK FLOW RATE(CFS) =     247.90
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.84   FLOW VELOCITY(FEET/SEC.) =   5.56
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13515.00 =    7679.54 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    773.74  DOWNSTREAM(FEET) =    717.04
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2279.49   CHANNEL SLOPE =  0.0249
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.12
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.957
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      231.44      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     316.43
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.38
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  AVERAGE FLOW DEPTH(FEET) =   3.07   TRAVEL TIME(MIN.) =   5.95
  Tc(MIN.) =   42.80
  SUBAREA AREA(ACRES) =   231.44       SUBAREA RUNOFF(CFS) =  136.92
  EFFECTIVE AREA(ACRES) =    598.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      598.7         PEAK FLOW RATE(CFS) =     354.18
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.25   FLOW VELOCITY(FEET/SEC.) =   6.59
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13520.00 =    9959.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   42.80
  RAINFALL INTENSITY(INCH/HR) =   0.96
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     598.68
  TOTAL STREAM AREA(ACRES) =     598.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     354.18

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      198.76   52.53    0.849  0.30( 0.27) 0.89     379.5   13500.00
      2      354.18   42.80    0.957  0.30( 0.30) 1.00     598.7   13510.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      546.11   42.80    0.957  0.30( 0.29) 0.96     907.8   13510.00
      2      494.87   52.53    0.849  0.30( 0.29) 0.96     978.1   13500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     546.11    Tc(MIN.) =    42.80
  EFFECTIVE AREA(ACRES) =     907.84   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =      978.1
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13520.00 TO NODE  13520.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    717.04  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.22   CHANNEL SLOPE =  0.0084
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.73
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.889
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.31      0.30     0.965     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.965
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     598.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.77
  AVERAGE FLOW DEPTH(FEET) =   2.72   TRAVEL TIME(MIN.) =   5.84
  Tc(MIN.) =   48.63
  SUBAREA AREA(ACRES) =   193.31       SUBAREA RUNOFF(CFS) =  104.31
  EFFECTIVE AREA(ACRES) =   1101.15     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     1171.4         PEAK FLOW RATE(CFS) =     594.64
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.71   FLOW VELOCITY(FEET/SEC.) =   5.75
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.50 =   14246.39 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      594.64   48.63    0.889  0.30( 0.29) 0.96    1101.2   13510.00
      2      533.21   58.55    0.793  0.30( 0.29) 0.96    1171.4   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     594.64  Tc(MIN.) =   48.63
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1101.15

****************************************************************************
  FLOW PROCESS FROM NODE  13520.50 TO NODE  13521.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    661.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1622.36   CHANNEL SLOPE =  0.0235
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.10
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.855
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.79      0.30     0.897     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.897
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     628.88
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.28
  AVERAGE FLOW DEPTH(FEET) =   2.09   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   51.90
  SUBAREA AREA(ACRES) =   129.79       SUBAREA RUNOFF(CFS) =   68.49
  EFFECTIVE AREA(ACRES) =   1230.94     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     1301.2         PEAK FLOW RATE(CFS) =     629.78
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.10   FLOW VELOCITY(FEET/SEC.) =   8.28
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13521.00 =   15868.75 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      629.78   51.90    0.855  0.30( 0.29) 0.96    1230.9   13510.00
      2      567.20   61.94    0.770  0.30( 0.29) 0.95    1301.2   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     629.78  Tc(MIN.) =   51.90
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1230.94

****************************************************************************
  FLOW PROCESS FROM NODE  13521.00 TO NODE  13522.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    661.95  DOWNSTREAM(FEET) =    632.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2746.01   CHANNEL SLOPE =  0.0108
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.77
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.791
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      278.60      0.30     0.905     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.905
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     694.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.59
  AVERAGE FLOW DEPTH(FEET) =   2.76   TRAVEL TIME(MIN.) =   6.95
  Tc(MIN.) =   58.85
  SUBAREA AREA(ACRES) =   278.60       SUBAREA RUNOFF(CFS) =  130.20
  EFFECTIVE AREA(ACRES) =   1509.54     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =     1579.8         PEAK FLOW RATE(CFS) =     688.38
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.74   FLOW VELOCITY(FEET/SEC.) =   6.57
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13522.00 =   18614.76 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      688.38   58.85    0.791  0.30( 0.28) 0.95    1509.5   13510.00
      2      640.49   69.13    0.734  0.30( 0.28) 0.94    1579.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     688.38  Tc(MIN.) =   58.85
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1509.54
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     1579.8  TC(MIN.) =     58.85
  EFFECTIVE AREA(ACRES) =   1509.54  AREA-AVERAGED Fm(INCH/HR)=  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.947
  PEAK FLOW RATE(CFS)   =     688.38

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      688.38   58.85    0.791  0.30( 0.28) 0.95    1509.5   13510.00
      2      640.49   69.13    0.734  0.30( 0.28) 0.94    1579.8   13500.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S36.DAT
  TIME/DATE OF STUDY: 13:51 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.720
   2)   10.00;  2.487
   3)   15.00;  1.851
   4)   20.00;  1.582
   5)   25.00;  1.382
   6)   30.00;  1.244
   7)   40.00;  1.061
   8)   50.00;  0.944
   9)   60.00;  0.855
  10)   90.00;  0.707
  11)  120.00;  0.622
  12)  180.00;  0.520
  13)  360.00;  0.381
  14) 1440.00;  0.166
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13600.00 TO NODE  13600.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   488.61
  ELEVATION DATA: UPSTREAM(FEET) =    872.12  DOWNSTREAM(FEET) =    744.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.995
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.360
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        3.39      0.30     1.000     0   11.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.29
  TOTAL AREA(ACRES) =      3.39   PEAK FLOW RATE(CFS) =      6.29

**************************************************************************
  FLOW PROCESS FROM NODE  13600.50 TO NODE  13601.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    744.80  DOWNSTREAM(FEET) =    707.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =   418.30   CHANNEL SLOPE =  0.0896
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.100
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.41
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   2.04
  Tc(MIN.) =   13.04
  SUBAREA AREA(ACRES) =     7.45       SUBAREA RUNOFF(CFS) =   12.07
  EFFECTIVE AREA(ACRES) =     10.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       10.8          PEAK FLOW RATE(CFS) =      17.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   3.89
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13601.00 =     906.91 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13601.00 TO NODE  13602.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    707.32  DOWNSTREAM(FEET) =    657.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   777.60   CHANNEL SLOPE =  0.0646
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.77
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.806
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.62
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   2.81
  Tc(MIN.) =   15.84
  SUBAREA AREA(ACRES) =    30.96       SUBAREA RUNOFF(CFS) =   41.95
  EFFECTIVE AREA(ACRES) =     41.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.8         PEAK FLOW RATE(CFS) =      56.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   5.26
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13602.00 =    1684.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13602.00 TO NODE  13603.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.12  DOWNSTREAM(FEET) =    584.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1186.54   CHANNEL SLOPE =  0.0611
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.615
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.56
  AVERAGE FLOW DEPTH(FEET) =   1.05   TRAVEL TIME(MIN.) =   3.56
  Tc(MIN.) =   19.40
  SUBAREA AREA(ACRES) =    23.36       SUBAREA RUNOFF(CFS) =   27.64
  EFFECTIVE AREA(ACRES) =     65.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       65.2         PEAK FLOW RATE(CFS) =      77.09
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   5.72
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13603.00 =    2871.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.58  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   860.98   CHANNEL SLOPE =  0.0461
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.30
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.501
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      88.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.44
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   2.64
  Tc(MIN.) =   22.04
  SUBAREA AREA(ACRES) =    21.24       SUBAREA RUNOFF(CFS) =   22.95
  EFFECTIVE AREA(ACRES) =     86.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       86.4         PEAK FLOW RATE(CFS) =      93.37
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.33   FLOW VELOCITY(FEET/SEC.) =   5.53
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  10
--------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
================================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 15.1
--------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: S35.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      688.38   58.85  0.30( 0.28) 0.95    1509.5   13510.00
```

```
      2      640.49   69.13  0.30( 0.28) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =     1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      688.38   58.85  0.30( 0.28) 0.95    1509.5   13510.00
      2      640.49   69.13  0.30( 0.28) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =      1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13523.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    632.19  DOWNSTREAM(FEET) =    561.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1151.68   CHANNEL SLOPE =  0.0618
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.67
  CHANNEL FLOW THRU SUBAREA(CFS) =     688.38
  FLOW VELOCITY(FEET/SEC.) =  11.79   FLOW DEPTH(FEET) =   1.67
  TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   60.48
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      772.50   60.48    0.853  0.30( 0.28) 0.95    1509.5   13510.00
      2      737.15   70.79    0.802  0.30( 0.28) 0.94    1579.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     772.50  Tc(MIN.) =   60.48
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1509.54

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610201V.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       53.21   14.94  0.30( 0.30) 1.00      37.9   20100.00
```



```
    TOTAL AREA(ACRES) =       37.9

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      772.50   60.48    0.853  0.30( 0.28) 0.95    1509.5   13510.00
      2      737.15   70.79    0.802  0.30( 0.28) 0.94    1579.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       53.21   14.94    1.858  0.30( 0.30) 1.00      37.9   20100.00
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  13523.00 =    2767.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      581.61   14.94    1.858  0.30( 0.29) 0.95     410.9   20100.00
      2      791.37   60.48    0.853  0.30( 0.28) 0.95    1547.5   13510.00
      3      754.28   70.79    0.802  0.30( 0.28) 0.95    1617.8   13500.00
    TOTAL AREA(ACRES) =      1617.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      791.37  Tc(MIN.) =   60.476
  EFFECTIVE AREA(ACRES) =   1547.48  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1617.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13524.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    561.00  DOWNSTREAM(FEET) =    556.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   238.34   CHANNEL SLOPE =  0.0210
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.46
  CHANNEL FLOW THRU SUBAREA(CFS) =     791.37
  FLOW VELOCITY(FEET/SEC.) =   8.60   FLOW DEPTH(FEET) =   2.46
  TRAVEL TIME(MIN.) =   0.46   Tc(MIN.) =   60.94
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      581.61   15.45    1.827  0.30( 0.29) 0.95     410.9   20100.00
      2      791.37   60.94    0.850  0.30( 0.28) 0.95    1547.5   13510.00
      3      754.28   71.26    0.799  0.30( 0.28) 0.95    1617.8   13500.00
```

```
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     791.37  Tc(MIN.) =   60.94
 AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1547.48

****************************************************************************
 FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610202V.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       45.49   13.54  0.30( 0.30) 1.00      29.1   20200.00
     2       45.49   13.54  0.30( 0.30) 1.00      29.1   20210.00
   TOTAL AREA(ACRES) =       29.1

****************************************************************************
 FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      581.61   15.45    1.827  0.30( 0.29) 0.95     410.9   20100.00
     2      791.37   60.94    0.850  0.30( 0.28) 0.95    1547.5   13510.00
     3      754.28   71.26    0.799  0.30( 0.28) 0.95    1617.8   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       45.49   13.54    2.036  0.30( 0.30) 1.00      29.1   20200.00
     2       45.49   13.54    2.036  0.30( 0.30) 1.00      29.1   20210.00
 LONGEST FLOWPATH FROM NODE  20210.00 TO NODE  13524.00 =    2247.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      624.62   13.54    2.036  0.30( 0.29) 0.96     389.2   20200.00
     2      624.61   13.54    2.036  0.30( 0.29) 0.96     389.3   20210.00
     3      621.62   15.45    1.827  0.30( 0.29) 0.96     440.0   20100.00
     4      805.79   60.94    0.850  0.30( 0.28) 0.95    1576.6   13510.00
     5      767.37   71.26    0.799  0.30( 0.28) 0.95    1646.9   13500.00
   TOTAL AREA(ACRES) =      1646.9

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      805.79  Tc(MIN.) =   60.938
 EFFECTIVE AREA(ACRES) =   1576.59  AREA-AVERAGED Fm(INCH/HR) =  0.28
```



```
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     1646.9
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13524.00 TO NODE  13620.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    556.00  DOWNSTREAM(FEET) =    544.91
 CHANNEL LENGTH THRU SUBAREA(FEET) =   672.93   CHANNEL SLOPE =  0.0165
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.68
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.843
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       27.94      0.30     0.884     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.884
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     813.06
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.99
 AVERAGE FLOW DEPTH(FEET) =   2.68   TRAVEL TIME(MIN.) =   1.40
 Tc(MIN.) =   62.34
 SUBAREA AREA(ACRES) =    27.94       SUBAREA RUNOFF(CFS) =   14.54
 EFFECTIVE AREA(ACRES) =   1604.53     AREA-AVERAGED Fm(INCH/HR) =   0.28
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
 TOTAL AREA(ACRES) =     1674.8          PEAK FLOW RATE(CFS) =     807.34
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.67

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.67   FLOW VELOCITY(FEET/SEC.) =   7.97
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      624.62   15.06    1.848  0.30( 0.29) 0.95     417.2   20200.00
     2      624.61   15.06    1.848  0.30( 0.29) 0.95     417.2   20210.00
     3      621.62   16.97    1.745  0.30( 0.29) 0.95     467.9   20100.00
     4      807.34   62.34    0.843  0.30( 0.28) 0.95    1604.5   13510.00
     5      767.37   72.69    0.792  0.30( 0.28) 0.95    1674.8   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     807.34  Tc(MIN.) =   62.34
 AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1604.53

****************************************************************************
 FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	624.62	15.06	1.848	0.30(0.29)	0.95	417.2	20200.00
2	624.61	15.06	1.848	0.30(0.29)	0.95	417.2	20210.00
3	621.62	16.97	1.745	0.30(0.29)	0.95	467.9	20100.00
4	807.34	62.34	0.843	0.30(0.28)	0.95	1604.5	13510.00
5	767.37	72.69	0.792	0.30(0.28)	0.95	1674.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	93.37	22.04	1.501	0.30(0.30)	1.00	86.4	13600.00

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13620.00 = 3732.03 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	706.84	15.06	1.848	0.30(0.29)	0.96	476.2	20200.00
2	706.84	15.06	1.848	0.30(0.29)	0.96	476.3	20210.00
3	708.13	16.97	1.745	0.30(0.29)	0.96	534.4	20100.00
4	735.76	22.04	1.501	0.30(0.29)	0.96	681.4	13600.00
5	849.60	62.34	0.843	0.30(0.29)	0.95	1690.9	13510.00
6	805.66	72.69	0.792	0.30(0.28)	0.95	1761.2	13500.00

TOTAL AREA(ACRES) = 1761.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 849.60 Tc(MIN.) = 62.341
EFFECTIVE AREA(ACRES) = 1690.93 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 1761.2
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

****
FLOW PROCESS FROM NODE 13620.00 TO NODE 13621.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 544.91 DOWNSTREAM(FEET) = 527.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 868.57 CHANNEL SLOPE = 0.0206
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.58
CHANNEL FLOW THRU SUBAREA(CFS) = 849.60
FLOW VELOCITY(FEET/SEC.) = 8.74 FLOW DEPTH(FEET) = 2.58
TRAVEL TIME(MIN.) = 1.66 Tc(MIN.) = 64.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	706.84	16.81	1.753	0.30(0.29)	0.96	476.2	20200.00
2	706.84	16.82	1.753	0.30(0.29)	0.96	476.3	20210.00
3	708.13	18.72	1.651	0.30(0.29)	0.96	534.4	20100.00
4	735.76	23.78	1.431	0.30(0.29)	0.96	681.4	13600.00
5	849.60	64.00	0.835	0.30(0.29)	0.95	1690.9	13510.00
6	805.66	74.38	0.784	0.30(0.28)	0.95	1761.2	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 849.60 Tc(MIN.) = 64.00
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1690.93

****
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610203V.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	41.63	13.93	0.30(0.30)	1.00	27.4	20300.00

TOTAL AREA(ACRES) = 27.4

****
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	706.84	16.81	1.753	0.30(0.29)	0.96	476.2	20200.00
2	706.84	16.82	1.753	0.30(0.29)	0.96	476.3	20210.00
3	708.13	18.72	1.651	0.30(0.29)	0.96	534.4	20100.00
4	735.76	23.78	1.431	0.30(0.29)	0.96	681.4	13600.00
5	849.60	64.00	0.835	0.30(0.29)	0.95	1690.9	13510.00
6	805.66	74.38	0.784	0.30(0.28)	0.95	1761.2	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	41.63	13.93	1.987	0.30(0.30)	1.00	27.4	20300.00

LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 13621.00 = 2609.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	720.49	13.93	1.987	0.30(0.29)	0.96	421.9	20300.00
2	742.71	16.81	1.753	0.30(0.29)	0.96	503.6	20200.00
3	742.71	16.82	1.753	0.30(0.29)	0.96	503.7	20210.00
4	741.47	18.72	1.651	0.30(0.29)	0.96	561.9	20100.00
5	763.68	23.78	1.431	0.30(0.29)	0.96	708.8	13600.00
6	862.81	64.00	0.835	0.30(0.29)	0.95	1718.4	13510.00
7	817.61	74.38	0.784	0.30(0.28)	0.95	1788.6	13500.00

TOTAL AREA(ACRES) = 1788.6

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      862.81  Tc(MIN.) =   63.997
  EFFECTIVE AREA(ACRES) =   1718.35  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1788.6
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13622.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    527.00  DOWNSTREAM(FEET) =    512.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    56.08   CHANNEL SLOPE =  0.2675
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.24
  CHANNEL FLOW THRU SUBAREA(CFS) =     862.81
  FLOW VELOCITY(FEET/SEC.) =  20.62   FLOW DEPTH(FEET) =   1.24
  TRAVEL TIME(MIN.) =   0.05   Tc(MIN.) =   64.04
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      720.49   13.98    1.981  0.30( 0.29) 0.96     421.9   20300.00
      2      742.71   16.86    1.751  0.30( 0.29) 0.96     503.6   20200.00
      3      742.71   16.86    1.751  0.30( 0.29) 0.96     503.7   20210.00
      4      741.47   18.77    1.648  0.30( 0.29) 0.96     561.9   20100.00
      5      763.68   23.82    1.429  0.30( 0.29) 0.96     708.8   13600.00
      6      862.81   64.04    0.835  0.30( 0.29) 0.95    1718.4   13510.00
      7      817.61   74.42    0.784  0.30( 0.28) 0.95    1788.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     862.81  Tc(MIN.) =   64.04
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1718.35

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610204V.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       50.29   13.53  0.30( 0.30) 1.00      32.2   20400.00
    TOTAL AREA(ACRES) =       32.2

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  11
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----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      720.49   13.98    1.981  0.30( 0.29) 0.96     421.9   20300.00
      2      742.71   16.86    1.751  0.30( 0.29) 0.96     503.6   20200.00
      3      742.71   16.86    1.751  0.30( 0.29) 0.96     503.7   20210.00
      4      741.47   18.77    1.648  0.30( 0.29) 0.96     561.9   20100.00
      5      763.68   23.82    1.429  0.30( 0.29) 0.96     708.8   13600.00
      6      862.81   64.04    0.835  0.30( 0.29) 0.95    1718.4   13510.00
      7      817.61   74.42    0.784  0.30( 0.28) 0.95    1788.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       50.29   13.53    2.038  0.30( 0.30) 1.00      32.2   20400.00
  LONGEST FLOWPATH FROM NODE  20400.00 TO NODE  13622.00 =    2281.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      770.78   13.53    2.038  0.30( 0.29) 0.96     440.6   20400.00
      2      769.14   13.98    1.981  0.30( 0.29) 0.96     454.1   20300.00
      3      784.70   16.86    1.751  0.30( 0.29) 0.96     535.8   20200.00
      4      784.70   16.86    1.751  0.30( 0.29) 0.96     535.8   20210.00
      5      780.50   18.77    1.648  0.30( 0.29) 0.96     594.0   20100.00
      6      796.37   23.82    1.429  0.30( 0.29) 0.96     741.0   13600.00
      7      878.30   64.04    0.835  0.30( 0.29) 0.95    1750.5   13510.00
      8      831.62   74.42    0.784  0.30( 0.28) 0.95    1820.8   13500.00
    TOTAL AREA(ACRES) =      1820.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      878.30  Tc(MIN.) =   64.042
  EFFECTIVE AREA(ACRES) =   1750.51  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1820.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13640.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    512.00  DOWNSTREAM(FEET) =    489.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.72   CHANNEL SLOPE =  0.0500
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.08
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.832
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.88      0.30     1.000     -
```

```
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     905.32
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.02
 AVERAGE FLOW DEPTH(FEET) =   2.08   TRAVEL TIME(MIN.) =   0.64
 Tc(MIN.) =   64.68
 SUBAREA AREA(ACRES) =   112.88       SUBAREA RUNOFF(CFS) =   54.04
 EFFECTIVE AREA(ACRES) =   1863.39     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     1933.7          PEAK FLOW RATE(CFS) =     914.62
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.09   FLOW VELOCITY(FEET/SEC.) =  12.08
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      828.97   14.18    1.955  0.30( 0.29) 0.97     553.5   20400.00
     2      820.11   14.63    1.898  0.30( 0.29) 0.97     567.0   20300.00
     3      832.27   17.51    1.716  0.30( 0.29) 0.97     648.7   20200.00
     4      832.29   17.51    1.716  0.30( 0.29) 0.97     648.7   20210.00
     5      841.94   19.42    1.614  0.30( 0.29) 0.97     706.9   20100.00
     6      856.01   24.47    1.403  0.30( 0.29) 0.97     853.9   13600.00
     7      914.62   64.68    0.832  0.30( 0.29) 0.96    1863.4   13510.00
     8      861.13   75.07    0.781  0.30( 0.29) 0.95    1933.7   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     914.62  Tc(MIN.) =   64.68
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1863.39

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610205V.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       14.48   11.49  0.30( 0.30) 1.00       8.1   20500.00
   TOTAL AREA(ACRES) =        8.1

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      828.97   14.18    1.955  0.30( 0.29) 0.97     553.5   20400.00
     2      820.11   14.63    1.898  0.30( 0.29) 0.97     567.0   20300.00
     3      832.27   17.51    1.716  0.30( 0.29) 0.97     648.7   20200.00
```



```
     4      832.29   17.51    1.716  0.30( 0.29) 0.97     648.7   20210.00
     5      841.94   19.42    1.614  0.30( 0.29) 0.97     706.9   20100.00
     6      856.01   24.47    1.403  0.30( 0.29) 0.97     853.9   13600.00
     7      914.62   64.68    0.832  0.30( 0.29) 0.96    1863.4   13510.00
     8      861.13   75.07    0.781  0.30( 0.29) 0.95    1933.7   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       14.48   11.49    2.297  0.30( 0.30) 1.00       8.1   20500.00
 LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  13640.00 =    1025.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      824.38   11.49    2.297  0.30( 0.29) 0.97     456.6   20500.00
     2      840.97   14.18    1.955  0.30( 0.29) 0.97     561.5   20400.00
     3      831.70   14.63    1.898  0.30( 0.29) 0.97     575.0   20300.00
     4      842.54   17.51    1.716  0.30( 0.29) 0.97     656.7   20200.00
     5      842.55   17.51    1.716  0.30( 0.29) 0.97     656.8   20210.00
     6      851.46   19.42    1.614  0.30( 0.29) 0.97     714.9   20100.00
     7      864.02   24.47    1.403  0.30( 0.29) 0.97     861.9   13600.00
     8      918.48   64.68    0.832  0.30( 0.29) 0.96    1871.4   13510.00
     9      864.61   75.07    0.781  0.30( 0.29) 0.95    1941.7   13500.00
   TOTAL AREA(ACRES) =      1941.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      918.48  Tc(MIN.) =   64.679
 EFFECTIVE AREA(ACRES) =   1871.45  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =     1941.7
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13641.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    489.00  DOWNSTREAM(FEET) =    436.89
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2992.90   CHANNEL SLOPE =  0.0174
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.90
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.803
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      180.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     959.32
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.59
 AVERAGE FLOW DEPTH(FEET) =   2.89   TRAVEL TIME(MIN.) =   5.81
 Tc(MIN.) =   70.49
 SUBAREA AREA(ACRES) =   180.31       SUBAREA RUNOFF(CFS) =   81.68
 EFFECTIVE AREA(ACRES) =   2051.76     AREA-AVERAGED Fm(INCH/HR) =   0.29
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 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     2122.0         PEAK FLOW RATE(CFS) =     951.91
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.88

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.88   FLOW VELOCITY(FEET/SEC.) =   8.56
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13641.00 =   25054.98 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      824.38   17.34    1.725  0.30( 0.29) 0.98     636.9   20500.00
     2      860.22   20.02    1.582  0.30( 0.29) 0.98     741.9   20400.00
     3      863.07   20.49    1.563  0.30( 0.29) 0.98     755.3   20300.00
     4      870.15   23.37    1.448  0.30( 0.29) 0.98     837.0   20200.00
     5      870.16   23.37    1.448  0.30( 0.29) 0.98     837.1   20210.00
     6      872.28   25.27    1.375  0.30( 0.29) 0.97     895.3   20100.00
     7      888.25   30.32    1.238  0.30( 0.29) 0.97    1042.2   13600.00
     8      951.91   70.49    0.803  0.30( 0.29) 0.96    2051.8   13510.00
     9      886.83   80.99    0.751  0.30( 0.29) 0.96    2122.0   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     951.91  Tc(MIN.) =   70.49
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    2051.76

****************************************************************************
 FLOW PROCESS FROM NODE  13641.00 TO NODE  13642.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    436.89  DOWNSTREAM(FEET) =    394.80
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2814.16   CHANNEL SLOPE =  0.0150
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.18
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.776
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      451.39      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1048.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.37
 AVERAGE FLOW DEPTH(FEET) =   3.17   TRAVEL TIME(MIN.) =   5.60
 Tc(MIN.) =   76.09
 SUBAREA AREA(ACRES) =   451.39       SUBAREA RUNOFF(CFS) =  193.25
 EFFECTIVE AREA(ACRES) =   2503.15     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     2573.4         PEAK FLOW RATE(CFS) =    1094.16
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.25

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  3.25   FLOW VELOCITY(FEET/SEC.) =   8.48
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13642.00 =   27869.14 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1145.31   22.92    1.466  0.30( 0.30) 0.99    1088.3   20500.00
     2     1149.95   25.57    1.367  0.30( 0.30) 0.99    1193.2   20400.00
     3     1148.89   26.04    1.354  0.30( 0.30) 0.99    1206.7   20300.00
     4     1134.70   28.93    1.274  0.30( 0.30) 0.98    1288.4   20200.00
     5     1134.69   28.94    1.274  0.30( 0.30) 0.98    1288.5   20210.00
     6     1131.76   30.86    1.229  0.30( 0.29) 0.98    1346.6   20100.00
     7     1132.17   35.91    1.136  0.30( 0.29) 0.98    1493.6   13600.00
     8     1094.16   76.09    0.776  0.30( 0.29) 0.97    2503.1   13510.00
     9     1004.76   86.73    0.723  0.30( 0.29) 0.96    2573.4   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1149.95  Tc(MIN.) =   25.57
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1193.24

****************************************************************************
 FLOW PROCESS FROM NODE  13642.00 TO NODE  13643.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    394.80  DOWNSTREAM(FEET) =    342.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2913.57   CHANNEL SLOPE =  0.0180
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.48
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.233
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      434.58      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1332.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.61
 AVERAGE FLOW DEPTH(FEET) =   3.44   TRAVEL TIME(MIN.) =   5.05
 Tc(MIN.) =   30.62
 SUBAREA AREA(ACRES) =   434.58       SUBAREA RUNOFF(CFS) =  364.91
 EFFECTIVE AREA(ACRES) =   1627.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =     3008.0         PEAK FLOW RATE(CFS) =    1371.29
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.49

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.49   FLOW VELOCITY(FEET/SEC.) =   9.70
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13643.00 =   30782.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1375.03   27.96    1.301  0.30( 0.30) 0.99    1522.9   20500.00
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      2     1371.29   30.62    1.233  0.30( 0.30) 0.99    1627.8   20400.00
      3     1369.83   31.10    1.224  0.30( 0.30) 0.99    1641.3   20300.00
      4     1355.93   34.02    1.171  0.30( 0.30) 0.99    1723.0   20200.00
      5     1355.92   34.02    1.171  0.30( 0.30) 0.99    1723.1   20210.00
      6     1345.60   35.95    1.135  0.30( 0.30) 0.99    1781.2   20100.00
      7     1308.41   41.02    1.049  0.30( 0.30) 0.98    1928.2   13600.00
      8     1211.89   81.33    0.750  0.30( 0.29) 0.97    2937.7   13510.00
      9     1110.36   92.11    0.701  0.30( 0.29) 0.97    3008.0   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1375.03  Tc(MIN.) =   27.96
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1522.91

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    342.39  DOWNSTREAM(FEET) =    300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1591.23   CHANNEL SLOPE =  0.0266
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.20
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.238
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      109.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1421.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.24
  AVERAGE FLOW DEPTH(FEET) =   3.19   TRAVEL TIME(MIN.) =   2.36
  Tc(MIN.) =   30.32
  SUBAREA AREA(ACRES) =   109.24       SUBAREA RUNOFF(CFS) =   92.26
  EFFECTIVE AREA(ACRES) =   1632.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3117.3         PEAK FLOW RATE(CFS) =    1382.12
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.15   FLOW VELOCITY(FEET/SEC.) =  11.13
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1382.12   30.32    1.238  0.30( 0.30) 0.99    1632.1   20500.00
      2     1395.48   32.98    1.190  0.30( 0.30) 0.99    1737.1   20400.00
      3     1392.54   33.47    1.181  0.30( 0.30) 0.99    1750.6   20300.00
      4     1370.01   36.39    1.127  0.30( 0.30) 0.99    1832.2   20200.00
      5     1369.99   36.39    1.127  0.30( 0.30) 0.99    1832.3   20210.00
      6     1353.73   38.33    1.092  0.30( 0.30) 0.99    1890.5   20100.00
      7     1330.12   43.43    1.021  0.30( 0.30) 0.99    2037.5   13600.00
      8     1222.71   83.80    0.738  0.30( 0.29) 0.97    3047.0   13510.00
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      9     1129.57   94.65    0.694  0.30( 0.29) 0.97    3117.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1395.48  Tc(MIN.) =   32.98
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1737.06

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
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  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610206V.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      190.41   23.63  0.30( 0.30) 1.00     186.0   20600.00
    TOTAL AREA(ACRES) =      186.0

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1382.12   30.32    1.238  0.30( 0.30) 0.99    1632.1   20500.00
      2     1395.48   32.98    1.190  0.30( 0.30) 0.99    1737.1   20400.00
      3     1392.54   33.47    1.181  0.30( 0.30) 0.99    1750.6   20300.00
      4     1370.01   36.39    1.127  0.30( 0.30) 0.99    1832.2   20200.00
      5     1369.99   36.39    1.127  0.30( 0.30) 0.99    1832.3   20210.00
      6     1353.73   38.33    1.092  0.30( 0.30) 0.99    1890.5   20100.00
      7     1330.12   43.43    1.021  0.30( 0.30) 0.99    2037.5   13600.00
      8     1222.71   83.80    0.738  0.30( 0.29) 0.97    3047.0   13510.00
      9     1129.57   94.65    0.694  0.30( 0.29) 0.97    3117.3   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      190.41   23.63    1.437  0.30( 0.30) 1.00     186.0   20600.00
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  13660.00 =    6967.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1495.01   23.63    1.437  0.30( 0.30) 0.99    1457.9   20600.00
      2     1539.24   30.32    1.238  0.30( 0.30) 0.99    1818.2   20500.00
      3     1544.45   32.98    1.190  0.30( 0.30) 0.99    1923.1   20400.00
      4     1540.03   33.47    1.181  0.30( 0.30) 0.99    1936.6   20300.00
      5     1508.54   36.39    1.127  0.30( 0.30) 0.99    2018.3   20200.00
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      6     1508.52   36.39    1.127  0.30( 0.30) 0.99    2018.3   20210.00
      7     1486.33   38.33    1.092  0.30( 0.30) 0.99    2076.5   20100.00
      8     1450.84   43.43    1.021  0.30( 0.30) 0.99    2223.5   13600.00
      9     1295.99   83.80    0.738  0.30( 0.29) 0.97    3233.0   13510.00
     10     1195.51   94.65    0.694  0.30( 0.29) 0.97    3303.3   13500.00
    TOTAL AREA(ACRES) =      3303.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1544.45  Tc(MIN.) =   32.984
  EFFECTIVE AREA(ACRES) =   1923.09  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3303.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    300.00  DOWNSTREAM(FEET) =    288.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   933.89   CHANNEL SLOPE =  0.0128
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.12
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.158
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1568.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.98
  AVERAGE FLOW DEPTH(FEET) =   4.12   TRAVEL TIME(MIN.) =   1.73
  Tc(MIN.) =   34.72
  SUBAREA AREA(ACRES) =    61.43       SUBAREA RUNOFF(CFS) =   47.44
  EFFECTIVE AREA(ACRES) =   1984.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3364.7         PEAK FLOW RATE(CFS) =    1544.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.09   FLOW VELOCITY(FEET/SEC.) =   8.94
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1495.01   25.38    1.372  0.30( 0.30) 0.99    1519.3   20600.00
      2     1539.24   32.06    1.207  0.30( 0.30) 0.99    1879.6   20500.00
      3     1544.45   34.72    1.158  0.30( 0.30) 0.99    1984.5   20400.00
      4     1540.03   35.20    1.149  0.30( 0.30) 0.99    1998.0   20300.00
      5     1508.54   38.14    1.095  0.30( 0.30) 0.99    2079.7   20200.00
      6     1508.52   38.14    1.095  0.30( 0.30) 0.99    2079.8   20210.00
```



```
      7     1486.33   40.08    1.060  0.30( 0.30) 0.99    2137.9   20100.00
      8     1450.84   45.20    1.000  0.30( 0.30) 0.99    2284.9   13600.00
      9     1295.99   85.63    0.729  0.30( 0.29) 0.97    3294.4   13510.00
     10     1201.13   96.53    0.688  0.30( 0.29) 0.97    3364.7   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1544.45  Tc(MIN.) =   34.72
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1984.52

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610207V.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      229.86   17.05  0.30( 0.28) 0.92     174.5   20700.00
    TOTAL AREA(ACRES) =      174.5

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1495.01   25.38    1.372  0.30( 0.30) 0.99    1519.3   20600.00
      2     1539.24   32.06    1.207  0.30( 0.30) 0.99    1879.6   20500.00
      3     1544.45   34.72    1.158  0.30( 0.30) 0.99    1984.5   20400.00
      4     1540.03   35.20    1.149  0.30( 0.30) 0.99    1998.0   20300.00
      5     1508.54   38.14    1.095  0.30( 0.30) 0.99    2079.7   20200.00
      6     1508.52   38.14    1.095  0.30( 0.30) 0.99    2079.8   20210.00
      7     1486.33   40.08    1.060  0.30( 0.30) 0.99    2137.9   20100.00
      8     1450.84   45.20    1.000  0.30( 0.30) 0.99    2284.9   13600.00
      9     1295.99   85.63    0.729  0.30( 0.29) 0.97    3294.4   13510.00
     10     1201.13   96.53    0.688  0.30( 0.29) 0.97    3364.7   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      229.86   17.05    1.741  0.30( 0.28) 0.92     174.5   20700.00
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  13680.00 =    6221.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1579.30   17.05    1.741  0.30( 0.29) 0.98    1195.4   20700.00
```

```
      2     1666.97   25.38    1.372  0.30( 0.30) 0.99    1693.8   20600.00
      3     1685.24   32.06    1.207  0.30( 0.30) 0.99    2054.1   20500.00
      4     1682.81   34.72    1.158  0.30( 0.30) 0.99    2159.0   20400.00
      5     1677.00   35.20    1.149  0.30( 0.30) 0.99    2172.5   20300.00
      6     1637.07   38.14    1.095  0.30( 0.30) 0.98    2254.2   20200.00
      7     1637.05   38.14    1.095  0.30( 0.30) 0.98    2254.3   20210.00
      8     1609.37   40.08    1.060  0.30( 0.30) 0.98    2312.4   20100.00
      9     1564.41   45.20    1.000  0.30( 0.29) 0.98    2459.4   13600.00
     10     1366.91   85.63    0.729  0.30( 0.29) 0.97    3468.9   13510.00
     11     1265.75   96.53    0.688  0.30( 0.29) 0.97    3539.2   13500.00
    TOTAL AREA(ACRES) =      3539.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1685.24  Tc(MIN.) =   32.057
  EFFECTIVE AREA(ACRES) =   2054.11  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3539.2
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.00  DOWNSTREAM(FEET) =    242.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.77   CHANNEL SLOPE =  0.0161
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.09
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.119
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1726.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.00
  AVERAGE FLOW DEPTH(FEET) =   4.09   TRAVEL TIME(MIN.) =   4.77
  Tc(MIN.) =   36.83
  SUBAREA AREA(ACRES) =   112.53       SUBAREA RUNOFF(CFS) =   83.00
  EFFECTIVE AREA(ACRES) =   2166.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3651.8         PEAK FLOW RATE(CFS) =    1685.24
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.03   FLOW VELOCITY(FEET/SEC.) =   9.93
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1579.30   21.89    1.507  0.30( 0.30) 0.98    1308.0   20700.00
```



```
      2     1666.97   30.16    1.241  0.30( 0.30) 0.99    1806.3   20600.00
      3     1685.24   36.83    1.119  0.30( 0.30) 0.99    2166.6   20500.00
      4     1682.81   39.49    1.071  0.30( 0.30) 0.99    2271.6   20400.00
      5     1677.00   39.98    1.062  0.30( 0.30) 0.99    2285.0   20300.00
      6     1637.07   42.95    1.027  0.30( 0.30) 0.99    2366.7   20200.00
      7     1637.05   42.95    1.027  0.30( 0.30) 0.99    2366.8   20210.00
      8     1609.37   44.92    1.003  0.30( 0.30) 0.99    2425.0   20100.00
      9     1564.41   50.08    0.943  0.30( 0.29) 0.98    2571.9   13600.00
     10     1366.91   90.72    0.705  0.30( 0.29) 0.97    3581.5   13510.00
     11     1265.75  101.74    0.674  0.30( 0.29) 0.97    3651.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1685.24  Tc(MIN.) =   36.83
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2166.64

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610208V.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      223.53   16.24  0.30( 0.30) 0.99     167.2   20810.00
      2      218.48   19.58  0.30( 0.30) 0.99     185.8   20800.00
    TOTAL AREA(ACRES) =      185.8

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1579.30   21.89    1.507  0.30( 0.30) 0.98    1308.0   20700.00
      2     1666.97   30.16    1.241  0.30( 0.30) 0.99    1806.3   20600.00
      3     1685.24   36.83    1.119  0.30( 0.30) 0.99    2166.6   20500.00
      4     1682.81   39.49    1.071  0.30( 0.30) 0.99    2271.6   20400.00
      5     1677.00   39.98    1.062  0.30( 0.30) 0.99    2285.0   20300.00
      6     1637.07   42.95    1.027  0.30( 0.30) 0.99    2366.7   20200.00
      7     1637.05   42.95    1.027  0.30( 0.30) 0.99    2366.8   20210.00
      8     1609.37   44.92    1.003  0.30( 0.30) 0.99    2425.0   20100.00
      9     1564.41   50.08    0.943  0.30( 0.29) 0.98    2571.9   13600.00
     10     1366.91   90.72    0.705  0.30( 0.29) 0.97    3581.5   13510.00
     11     1265.75  101.74    0.674  0.30( 0.29) 0.97    3651.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      223.53   16.24    1.784  0.30( 0.30) 0.99     167.2   20810.00
    2      218.48   19.58    1.605  0.30( 0.30) 0.99     185.8   20800.00
LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  13682.00 =    5285.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1663.56   16.24    1.784  0.30( 0.30) 0.99    1137.5   20810.00
    2     1745.54   19.58    1.605  0.30( 0.30) 0.99    1355.7   20800.00
    3     1781.36   21.89    1.507  0.30( 0.30) 0.99    1493.8   20700.00
    4     1824.67   30.16    1.241  0.30( 0.30) 0.99    1992.1   20600.00
    5     1822.55   36.83    1.119  0.30( 0.30) 0.99    2352.5   20500.00
    6     1811.97   39.49    1.071  0.30( 0.30) 0.99    2457.4   20400.00
    7     1804.67   39.98    1.062  0.30( 0.30) 0.99    2470.9   20300.00
    8     1758.85   42.95    1.027  0.30( 0.30) 0.99    2552.6   20200.00
    9     1758.82   42.95    1.027  0.30( 0.30) 0.99    2552.6   20210.00
   10     1727.26   44.92    1.003  0.30( 0.30) 0.99    2610.8   20100.00
   11     1672.18   50.08    0.943  0.30( 0.30) 0.98    2757.8   13600.00
   12     1434.90   90.72    0.705  0.30( 0.29) 0.97    3767.3   13510.00
   13     1328.51  101.74    0.674  0.30( 0.29) 0.97    3837.6   13500.00
  TOTAL AREA(ACRES) =      3837.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1824.67  Tc(MIN.) =   30.156
 EFFECTIVE AREA(ACRES) =   1992.14  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =     3837.6
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.50 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    242.00  DOWNSTREAM(FEET) =    230.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   660.20   CHANNEL SLOPE =  0.0182
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.07
 CHANNEL FLOW THRU SUBAREA(CFS) =    1824.67
 FLOW VELOCITY(FEET/SEC.) =  10.62   FLOW DEPTH(FEET) =   4.07
 TRAVEL TIME(MIN.) =   1.04   Tc(MIN.) =   31.19
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1663.56   17.31    1.727  0.30( 0.30) 0.99    1137.5   20810.00
    2     1745.54   20.63    1.557  0.30( 0.30) 0.99    1355.7   20800.00
    3     1781.36   22.94    1.465  0.30( 0.30) 0.99    1493.8   20700.00
    4     1824.67   31.19    1.222  0.30( 0.30) 0.99    1992.1   20600.00
    5     1822.55   37.86    1.100  0.30( 0.30) 0.99    2352.5   20500.00
    6     1811.97   40.53    1.055  0.30( 0.30) 0.99    2457.4   20400.00
    7     1804.67   41.02    1.049  0.30( 0.30) 0.99    2470.9   20300.00
    8     1758.85   44.00    1.014  0.30( 0.30) 0.99    2552.6   20200.00
    9     1758.82   44.00    1.014  0.30( 0.30) 0.99    2552.6   20210.00
```



```
   10     1727.26   45.98    0.991  0.30( 0.30) 0.99    2610.8   20100.00
   11     1672.18   51.14    0.933  0.30( 0.30) 0.98    2757.8   13600.00
   12     1434.90   91.84    0.702  0.30( 0.29) 0.97    3767.3   13510.00
   13     1328.51  102.88    0.670  0.30( 0.29) 0.97    3837.6   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1824.67  Tc(MIN.) =   31.19
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1992.14

****************************************************************************
 FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610209V.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
 STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
    1       97.19   17.68  0.30( 0.30) 1.00      76.8   20900.00
  TOTAL AREA(ACRES) =       76.8

****************************************************************************
 FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     1663.56   17.31    1.727  0.30( 0.30) 0.99    1137.5   20810.00
    2     1745.54   20.63    1.557  0.30( 0.30) 0.99    1355.7   20800.00
    3     1781.36   22.94    1.465  0.30( 0.30) 0.99    1493.8   20700.00
    4     1824.67   31.19    1.222  0.30( 0.30) 0.99    1992.1   20600.00
    5     1822.55   37.86    1.100  0.30( 0.30) 0.99    2352.5   20500.00
    6     1811.97   40.53    1.055  0.30( 0.30) 0.99    2457.4   20400.00
    7     1804.67   41.02    1.049  0.30( 0.30) 0.99    2470.9   20300.00
    8     1758.85   44.00    1.014  0.30( 0.30) 0.99    2552.6   20200.00
    9     1758.82   44.00    1.014  0.30( 0.30) 0.99    2552.6   20210.00
   10     1727.26   45.98    0.991  0.30( 0.30) 0.99    2610.8   20100.00
   11     1672.18   51.14    0.933  0.30( 0.30) 0.98    2757.8   13600.00
   12     1434.90   91.84    0.702  0.30( 0.29) 0.97    3767.3   13510.00
   13     1328.51  102.88    0.670  0.30( 0.29) 0.97    3837.6   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1       97.19   17.68    1.707  0.30( 0.30) 1.00      76.8   20900.00
 LONGEST FLOWPATH FROM NODE  20900.00 TO NODE  13682.50 =    4089.00 FEET.

 ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1760.06	17.31	1.727	0.30(0.30)	0.99	1212.7	20810.00
2	1769.92	17.68	1.707	0.30(0.30)	0.99	1238.7	20900.00
3	1832.38	20.63	1.557	0.30(0.30)	0.99	1432.4	20800.00
4	1861.83	22.94	1.465	0.30(0.30)	0.99	1570.5	20700.00
5	1888.40	31.19	1.222	0.30(0.30)	0.99	2068.9	20600.00
6	1877.85	37.86	1.100	0.30(0.30)	0.99	2429.2	20500.00
7	1864.14	40.53	1.055	0.30(0.30)	0.99	2534.1	20400.00
8	1856.44	41.02	1.049	0.30(0.30)	0.99	2547.6	20300.00
9	1808.19	44.00	1.014	0.30(0.30)	0.99	2629.3	20200.00
10	1808.16	44.00	1.014	0.30(0.30)	0.99	2629.4	20210.00
11	1775.00	45.98	0.991	0.30(0.30)	0.99	2687.5	20100.00
12	1715.94	51.14	0.933	0.30(0.30)	0.98	2834.5	13600.00
13	1462.66	91.84	0.702	0.30(0.29)	0.97	3844.0	13510.00
14	1354.10	102.88	0.670	0.30(0.29)	0.97	3914.3	13500.00

TOTAL AREA(ACRES) = 3914.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1888.40 Tc(MIN.) = 31.193
EFFECTIVE AREA(ACRES) = 2068.89 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3914.3
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13683.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 230.00 DOWNSTREAM(FEET) = 208.53
CHANNEL LENGTH THRU SUBAREA(FEET) = 1866.20 CHANNEL SLOPE = 0.0115
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.73
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.160
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.32	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1912.53
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.16
AVERAGE FLOW DEPTH(FEET) = 4.73 TRAVEL TIME(MIN.) = 3.39
Tc(MIN.) = 34.59
SUBAREA AREA(ACRES) = 62.32 SUBAREA RUNOFF(CFS) = 48.26
EFFECTIVE AREA(ACRES) = 2131.21 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3976.6 PEAK FLOW RATE(CFS) = 1888.40
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.69 FLOW VELOCITY(FEET/SEC.) = 9.12

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13683.00 = 38695.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1760.06	20.77	1.552	0.30(0.30)	0.99	1275.0	20810.00
2	1769.92	21.13	1.537	0.30(0.30)	0.99	1301.0	20900.00
3	1832.38	24.05	1.420	0.30(0.30)	0.99	1494.8	20800.00
4	1861.83	26.34	1.345	0.30(0.30)	0.99	1632.9	20700.00
5	1888.40	34.59	1.160	0.30(0.30)	0.99	2131.2	20600.00
6	1877.85	41.27	1.046	0.30(0.30)	0.99	2491.5	20500.00
7	1864.14	43.94	1.015	0.30(0.30)	0.99	2596.4	20400.00
8	1856.44	44.43	1.009	0.30(0.30)	0.99	2609.9	20300.00
9	1808.19	47.44	0.974	0.30(0.30)	0.99	2691.6	20200.00
10	1808.16	47.44	0.974	0.30(0.30)	0.99	2691.7	20210.00
11	1775.00	49.44	0.950	0.30(0.30)	0.99	2749.9	20100.00
12	1715.94	54.64	0.902	0.30(0.30)	0.98	2896.8	13600.00
13	1462.66	95.51	0.691	0.30(0.29)	0.98	3906.4	13510.00
14	1354.10	106.64	0.660	0.30(0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1888.40 Tc(MIN.) = 34.59
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2131.21

****
FLOW PROCESS FROM NODE 13683.00 TO NODE 13684.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 208.53 DOWNSTREAM(FEET) = 200.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 166.32 CHANNEL SLOPE = 0.0513
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.12
CHANNEL FLOW THRU SUBAREA(CFS) = 1888.40
FLOW VELOCITY(FEET/SEC.) = 15.36 FLOW DEPTH(FEET) = 3.12
TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 34.77
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1760.06	20.95	1.544	0.30(0.30)	0.99	1275.0	20810.00
2	1769.92	21.32	1.530	0.30(0.30)	0.99	1301.0	20900.00
3	1832.38	24.23	1.413	0.30(0.30)	0.99	1494.8	20800.00
4	1861.83	26.52	1.340	0.30(0.30)	0.99	1632.9	20700.00
5	1888.40	34.77	1.157	0.30(0.30)	0.99	2131.2	20600.00
6	1877.85	41.45	1.044	0.30(0.30)	0.99	2491.5	20500.00
7	1864.14	44.12	1.013	0.30(0.30)	0.99	2596.4	20400.00
8	1856.44	44.62	1.007	0.30(0.30)	0.99	2609.9	20300.00
9	1808.19	47.62	0.972	0.30(0.30)	0.99	2691.6	20200.00
10	1808.16	47.63	0.971	0.30(0.30)	0.99	2691.7	20210.00
11	1775.00	49.62	0.948	0.30(0.30)	0.99	2749.9	20100.00
12	1715.94	54.82	0.901	0.30(0.30)	0.98	2896.8	13600.00
13	1462.66	95.70	0.691	0.30(0.29)	0.98	3906.4	13510.00
14	1354.10	106.84	0.659	0.30(0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:

```
  PEAK FLOW RATE(CFS) =    1888.40  Tc(MIN.) =   34.77
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2131.21

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610210V.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      104.05   17.85  0.30( 0.30) 1.00      82.7   21000.00
    TOTAL AREA(ACRES) =       82.7

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1760.06   20.95    1.544  0.30( 0.30) 0.99    1275.0   20810.00
      2     1769.92   21.32    1.530  0.30( 0.30) 0.99    1301.0   20900.00
      3     1832.38   24.23    1.413  0.30( 0.30) 0.99    1494.8   20800.00
      4     1861.83   26.52    1.340  0.30( 0.30) 0.99    1632.9   20700.00
      5     1888.40   34.77    1.157  0.30( 0.30) 0.99    2131.2   20600.00
      6     1877.85   41.45    1.044  0.30( 0.30) 0.99    2491.5   20500.00
      7     1864.14   44.12    1.013  0.30( 0.30) 0.99    2596.4   20400.00
      8     1856.44   44.62    1.007  0.30( 0.30) 0.99    2609.9   20300.00
      9     1808.19   47.62    0.972  0.30( 0.30) 0.99    2691.6   20200.00
     10     1808.16   47.63    0.971  0.30( 0.30) 0.99    2691.7   20210.00
     11     1775.00   49.62    0.948  0.30( 0.30) 0.99    2749.9   20100.00
     12     1715.94   54.82    0.901  0.30( 0.30) 0.98    2896.8   13600.00
     13     1462.66   95.70    0.691  0.30( 0.29) 0.98    3906.4   13510.00
     14     1354.10  106.84    0.659  0.30( 0.29) 0.97    3976.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      104.05   17.85    1.698  0.30( 0.30) 1.00      82.7   21000.00
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  13684.00 =    4160.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1788.02   17.85    1.698  0.30( 0.30) 0.99    1169.0   21000.00
      2     1852.70   20.95    1.544  0.30( 0.30) 0.99    1357.7   20810.00
```



```
      3     1861.46   21.32    1.530  0.30( 0.30) 0.99    1383.7   20900.00
      4     1915.23   24.23    1.413  0.30( 0.30) 0.99    1577.5   20800.00
      5     1939.27   26.52    1.340  0.30( 0.30) 0.99    1715.6   20700.00
      6     1952.20   34.77    1.157  0.30( 0.30) 0.99    2213.9   20600.00
      7     1933.26   41.45    1.044  0.30( 0.30) 0.99    2574.2   20500.00
      8     1917.21   44.12    1.013  0.30( 0.30) 0.99    2679.2   20400.00
      9     1909.07   44.62    1.007  0.30( 0.30) 0.99    2692.6   20300.00
     10     1858.18   47.62    0.972  0.30( 0.30) 0.99    2774.3   20200.00
     11     1858.15   47.63    0.971  0.30( 0.30) 0.99    2774.4   20210.00
     12     1823.24   49.62    0.948  0.30( 0.30) 0.99    2832.6   20100.00
     13     1760.66   54.82    0.901  0.30( 0.30) 0.99    2979.5   13600.00
     14     1491.76   95.70    0.691  0.30( 0.29) 0.98    3989.1   13510.00
     15     1380.84  106.84    0.659  0.30( 0.29) 0.97    4059.3   13500.00
   TOTAL AREA(ACRES) =      4059.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1952.20  Tc(MIN.) =   34.768
  EFFECTIVE AREA(ACRES) =   2213.92  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     4059.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13685.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    200.00  DOWNSTREAM(FEET) =    194.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   122.69   CHANNEL SLOPE =  0.0469
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.26
  CHANNEL FLOW THRU SUBAREA(CFS) =    1952.20
  FLOW VELOCITY(FEET/SEC.) =  15.05   FLOW DEPTH(FEET) =   3.26
  TRAVEL TIME(MIN.) =   0.14   Tc(MIN.) =   34.90
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13685.00 =   38984.01 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1788.02   17.99    1.690  0.30( 0.30) 0.99    1169.0   21000.00
      2     1852.70   21.09    1.539  0.30( 0.30) 0.99    1357.7   20810.00
      3     1861.46   21.45    1.524  0.30( 0.30) 0.99    1383.7   20900.00
      4     1915.23   24.37    1.408  0.30( 0.30) 0.99    1577.5   20800.00
      5     1939.27   26.66    1.337  0.30( 0.30) 0.99    1715.6   20700.00
      6     1952.20   34.90    1.155  0.30( 0.30) 0.99    2213.9   20600.00
      7     1933.26   41.58    1.043  0.30( 0.30) 0.99    2574.2   20500.00
      8     1917.21   44.25    1.011  0.30( 0.30) 0.99    2679.2   20400.00
      9     1909.07   44.75    1.005  0.30( 0.30) 0.99    2692.6   20300.00
     10     1858.18   47.76    0.970  0.30( 0.30) 0.99    2774.3   20200.00
     11     1858.15   47.76    0.970  0.30( 0.30) 0.99    2774.4   20210.00
     12     1823.24   49.76    0.946  0.30( 0.30) 0.99    2832.6   20100.00
     13     1760.66   54.96    0.900  0.30( 0.30) 0.99    2979.5   13600.00
     14     1491.76   95.85    0.690  0.30( 0.29) 0.98    3989.1   13510.00
     15     1380.84  106.99    0.659  0.30( 0.29) 0.97    4059.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1952.20  Tc(MIN.) =   34.90
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 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2213.92

****************************************************************************
 FLOW PROCESS FROM NODE  13685.00 TO NODE  13410.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    194.24  DOWNSTREAM(FEET) =    178.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1843.57   CHANNEL SLOPE =  0.0084
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.20
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.086
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        8.39      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1955.17
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.25
 AVERAGE FLOW DEPTH(FEET) =   5.20   TRAVEL TIME(MIN.) =   3.72
 Tc(MIN.) =   38.63
 SUBAREA AREA(ACRES) =     8.39       SUBAREA RUNOFF(CFS) =    5.94
 EFFECTIVE AREA(ACRES) =   2222.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =     4067.7         PEAK FLOW RATE(CFS) =    1952.20
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.19

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.19   FLOW VELOCITY(FEET/SEC.) =   8.25
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13410.00 =   40827.58 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1788.02   21.81    1.510  0.30( 0.30) 0.99    1177.4   21000.00
     2     1852.70   24.87    1.388  0.30( 0.30) 0.99    1366.1   20810.00
     3     1861.46   25.23    1.376  0.30( 0.30) 0.99    1392.1   20900.00
     4     1915.23   28.11    1.296  0.30( 0.30) 0.99    1585.9   20800.00
     5     1939.27   30.39    1.237  0.30( 0.30) 0.99    1724.0   20700.00
     6     1952.20   38.63    1.086  0.30( 0.30) 0.99    2222.3   20600.00
     7     1933.26   45.32    0.999  0.30( 0.30) 0.99    2582.6   20500.00
     8     1917.21   48.00    0.967  0.30( 0.30) 0.99    2687.5   20400.00
     9     1909.07   48.50    0.961  0.30( 0.30) 0.99    2701.0   20300.00
    10     1858.18   51.54    0.930  0.30( 0.30) 0.99    2782.7   20200.00
    11     1858.15   51.54    0.930  0.30( 0.30) 0.99    2782.8   20210.00
    12     1823.24   53.55    0.912  0.30( 0.30) 0.99    2840.9   20100.00
    13     1760.66   58.80    0.866  0.30( 0.30) 0.99    2987.9   13600.00
    14     1491.76   99.88    0.679  0.30( 0.29) 0.98    3997.5   13510.00
    15     1380.84  111.11    0.647  0.30( 0.29) 0.97    4067.7   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1952.20  Tc(MIN.) =   38.63
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 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2222.31
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     4067.7  TC(MIN.) =     38.63
 EFFECTIVE AREA(ACRES) =   2222.31  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.989
 PEAK FLOW RATE(CFS)   =    1952.20

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1788.02   21.81    1.510  0.30( 0.30) 0.99    1177.4   21000.00
     2     1852.70   24.87    1.388  0.30( 0.30) 0.99    1366.1   20810.00
     3     1861.46   25.23    1.376  0.30( 0.30) 0.99    1392.1   20900.00
     4     1915.23   28.11    1.296  0.30( 0.30) 0.99    1585.9   20800.00
     5     1939.27   30.39    1.237  0.30( 0.30) 0.99    1724.0   20700.00
     6     1952.20   38.63    1.086  0.30( 0.30) 0.99    2222.3   20600.00
     7     1933.26   45.32    0.999  0.30( 0.30) 0.99    2582.6   20500.00
     8     1917.21   48.00    0.967  0.30( 0.30) 0.99    2687.5   20400.00
     9     1909.07   48.50    0.961  0.30( 0.30) 0.99    2701.0   20300.00
    10     1858.18   51.54    0.930  0.30( 0.30) 0.99    2782.7   20200.00
    11     1858.15   51.54    0.930  0.30( 0.30) 0.99    2782.8   20210.00
    12     1823.24   53.55    0.912  0.30( 0.30) 0.99    2840.9   20100.00
    13     1760.66   58.80    0.866  0.30( 0.30) 0.99    2987.9   13600.00
    14     1491.76   99.88    0.679  0.30( 0.29) 0.98    3997.5   13510.00
    15     1380.84  111.11    0.647  0.30( 0.29) 0.97    4067.7   13500.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S37.DAT
  TIME/DATE OF STUDY: 09:04 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.709
   2)   10.00;  2.481
   3)   15.00;  1.848
   4)   20.00;  1.580
   5)   25.00;  1.381
   6)   30.00;  1.243
   7)   40.00;  1.060
   8)   50.00;  0.942
   9)   60.00;  0.854
  10)   90.00;  0.706
  11)  120.00;  0.620
  12)  180.00;  0.519
  13)  360.00;  0.379
  14) 1200.00;  0.165
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S34.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    16689.61   19.41  0.30( 0.29) 0.98    4371.7   21100.00
      2    19186.06   30.84  0.30( 0.29) 0.98    7732.8   20700.00
      3    20606.02   39.67  0.30( 0.29) 0.98   10618.1   10100.00
      4    22175.14   48.92  0.30( 0.29) 0.98   14521.8   20300.00
      5    23937.24   62.60  0.30( 0.29) 0.97   20658.8   31400.00
      6    25061.83   75.76  0.30( 0.29) 0.97   26579.5   13100.00
      7    25358.71   82.80  0.30( 0.29) 0.97   29244.1   11801.00
      8    26586.46  100.28  0.30( 0.29) 0.97   37506.9   13510.00
      9    27268.87  107.89  0.30( 0.29) 0.97   41795.0   13010.00
     10    27984.54  113.80  0.30( 0.29) 0.97   45440.6   11330.00
     11    28542.32  121.90  0.30( 0.29) 0.97   50525.2   10630.00
     12    28268.28  127.51  0.30( 0.29) 0.98   53119.0   12330.00
     13    27993.39  134.14  0.30( 0.29) 0.98   56257.6   11600.00
     14    27602.45  139.94  0.30( 0.29) 0.98   58490.1   11111.00
     15    27167.61  146.12  0.30( 0.29) 0.98   60426.3   12201.00
     16    26227.75  155.15  0.30( 0.29) 0.98   62514.0   12231.00
     17    25369.43  162.74  0.30( 0.29) 0.98   63927.3   10400.00
     18    24001.05  174.30  0.30( 0.29) 0.98   65544.5   10320.00
     19    22709.22  184.20  0.30( 0.29) 0.98   65933.9   12000.00
     20    19726.35  213.90  0.30( 0.29) 0.98   66551.6   10100.00
   TOTAL AREA(ACRES) =    66551.6

**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    16689.61   19.41  0.30( 0.29) 0.98    4371.7   21100.00
      2    19186.06   30.84  0.30( 0.29) 0.98    7732.8   20700.00
      3    20606.02   39.67  0.30( 0.29) 0.98   10618.1   10100.00
      4    22175.14   48.92  0.30( 0.29) 0.98   14521.8   20300.00
      5    23937.24   62.60  0.30( 0.29) 0.97   20658.8   31400.00
      6    25061.83   75.76  0.30( 0.29) 0.97   26579.5   13100.00
      7    25358.71   82.80  0.30( 0.29) 0.97   29244.1   11801.00
      8    26586.46  100.28  0.30( 0.29) 0.97   37506.9   13510.00
      9    27268.87  107.89  0.30( 0.29) 0.97   41795.0   13010.00
     10    27984.54  113.80  0.30( 0.29) 0.97   45440.6   11330.00
     11    28542.32  121.90  0.30( 0.29) 0.97   50525.2   10630.00
     12    28268.28  127.51  0.30( 0.29) 0.98   53119.0   12330.00
     13    27993.39  134.14  0.30( 0.29) 0.98   56257.6   11600.00
     14    27602.45  139.94  0.30( 0.29) 0.98   58490.1   11111.00
     15    27167.61  146.12  0.30( 0.29) 0.98   60426.3   12201.00
     16    26227.75  155.15  0.30( 0.29) 0.98   62514.0   12231.00
     17    25369.43  162.74  0.30( 0.29) 0.98   63927.3   10400.00
     18    24001.05  174.30  0.30( 0.29) 0.98   65544.5   10320.00
```

```
     19    22709.22  184.20  0.30( 0.29) 0.98   65933.9   12000.00
     20    19726.35  213.90  0.30( 0.29) 0.98   66551.6   10100.00
    TOTAL AREA(ACRES) =     66551.6

****************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13701.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    167.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.11   CHANNEL SLOPE =  0.0015
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.39
  CHANNEL FLOW THRU SUBAREA(CFS) =   28542.32
  FLOW VELOCITY(FEET/SEC.) =   8.79   FLOW DEPTH(FEET) =  12.39
  TRAVEL TIME(MIN.) =   3.22   Tc(MIN.) =  125.12
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509102V.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      172.03   24.48  0.30( 0.26) 0.87     167.7   10200.00
    TOTAL AREA(ACRES) =      167.7

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16689.61   23.24    1.451  0.30( 0.29) 0.98    4371.7   21100.00
      2    19186.06   34.50    1.161  0.30( 0.29) 0.98    7732.8   20700.00
      3    20606.02   43.25    1.022  0.30( 0.29) 0.98   10618.1   10100.00
      4    22175.14   52.42    0.921  0.30( 0.29) 0.98   14521.8   20300.00
      5    23937.24   66.01    0.824  0.30( 0.29) 0.97   20658.8   31400.00
      6    25061.83   79.11    0.760  0.30( 0.29) 0.97   26579.5   13100.00
      7    25358.71   86.14    0.725  0.30( 0.29) 0.97   29244.1   11801.00
      8    26586.46  103.57    0.667  0.30( 0.29) 0.97   37506.9   13510.00
      9    27268.87  111.16    0.645  0.30( 0.29) 0.97   41795.0   13010.00
     10    27984.54  117.04    0.628  0.30( 0.29) 0.97   45440.6   11330.00
     11    28542.32  125.12    0.611  0.30( 0.29) 0.97   50525.2   10630.00
```



```
     12    28268.28  130.74    0.602  0.30( 0.29) 0.98   53119.0   12330.00
     13    27993.39  137.38    0.591  0.30( 0.29) 0.98   56257.6   11600.00
     14    27602.45  143.20    0.581  0.30( 0.29) 0.98   58490.1   11111.00
     15    27167.61  149.39    0.571  0.30( 0.29) 0.98   60426.3   12201.00
     16    26227.75  158.46    0.555  0.30( 0.29) 0.98   62514.0   12231.00
     17    25369.43  166.08    0.542  0.30( 0.29) 0.98   63927.3   10400.00
     18    24001.05  177.70    0.523  0.30( 0.29) 0.98   65544.5   10320.00
     19    22709.22  187.67    0.513  0.30( 0.29) 0.98   65933.9   12000.00
     20    19726.35  217.53    0.490  0.30( 0.29) 0.98   66551.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      172.03   24.48    1.402  0.30( 0.26) 0.87     167.7   10200.00
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  13701.00 =    9099.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16859.99   23.24    1.451  0.30( 0.29) 0.98    4530.9   21100.00
      2    17136.88   24.48    1.402  0.30( 0.29) 0.98    4909.9   10200.00
      3    19321.72   34.50    1.161  0.30( 0.29) 0.98    7900.5   20700.00
      4    20720.70   43.25    1.022  0.30( 0.29) 0.98   10785.7   10100.00
      5    22274.60   52.42    0.921  0.30( 0.29) 0.98   14689.4   20300.00
      6    24022.15   66.01    0.824  0.30( 0.29) 0.97   20826.5   31400.00
      7    25136.99   79.11    0.760  0.30( 0.29) 0.97   26747.2   13100.00
      8    25428.64   86.14    0.725  0.30( 0.29) 0.97   29411.8   11801.00
      9    26647.64  103.57    0.667  0.30( 0.29) 0.97   37674.5   13510.00
     10    27326.78  111.16    0.645  0.30( 0.29) 0.97   41962.7   13010.00
     11    28039.91  117.04    0.628  0.30( 0.29) 0.97   45608.3   11330.00
     12    28595.10  125.12    0.611  0.30( 0.29) 0.97   50692.8   10630.00
     13    28319.63  130.74    0.602  0.30( 0.29) 0.97   53286.7   12330.00
     14    28043.06  137.38    0.591  0.30( 0.29) 0.98   56425.3   11600.00
     15    27650.64  143.20    0.581  0.30( 0.29) 0.98   58657.7   11111.00
     16    27214.23  149.39    0.571  0.30( 0.29) 0.98   60594.0   12201.00
     17    26272.06  158.46    0.555  0.30( 0.29) 0.98   62681.7   12231.00
     18    25411.81  166.08    0.542  0.30( 0.29) 0.98   64095.0   10400.00
     19    24040.48  177.70    0.523  0.30( 0.29) 0.98   65712.2   10320.00
     20    22747.17  187.67    0.513  0.30( 0.29) 0.98   66101.5   12000.00
     21    19760.79  217.53    0.490  0.30( 0.29) 0.98   66719.3   10100.00
    TOTAL AREA(ACRES) =     66719.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    28595.10  Tc(MIN.) =  125.119
  EFFECTIVE AREA(ACRES) =  50692.84  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    66719.3
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    165.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   192.72   CHANNEL SLOPE =  0.0103
```

```
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.15
  CHANNEL FLOW THRU SUBAREA(CFS) =   28595.10
  FLOW VELOCITY(FEET/SEC.) =  16.95   FLOW DEPTH(FEET) =   7.15
  TRAVEL TIME(MIN.) =   0.19   Tc(MIN.) =  125.31
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13720.00 =  126443.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.51  DOWNSTREAM(FEET) =    161.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2042.40   CHANNEL SLOPE =  0.0019
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.56
  CHANNEL FLOW THRU SUBAREA(CFS) =   28595.10
  FLOW VELOCITY(FEET/SEC.) =   9.60   FLOW DEPTH(FEET) =  11.56
  TRAVEL TIME(MIN.) =   3.55   Tc(MIN.) =  128.85
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509103V.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      489.67   23.75  0.30( 0.28) 0.95     474.8   10300.00
    TOTAL AREA(ACRES) =      474.8

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16859.99   27.67    1.307  0.30( 0.29) 0.98    4530.9   21100.00
      2    17136.88   28.89    1.274  0.30( 0.29) 0.98    4909.9   10200.00
      3    19321.72   38.74    1.083  0.30( 0.29) 0.98    7900.5   20700.00
      4    20720.70   47.39    0.973  0.30( 0.29) 0.98   10785.7   10100.00
      5    22274.60   56.46    0.885  0.30( 0.29) 0.98   14689.4   20300.00
      6    24022.15   69.96    0.805  0.30( 0.29) 0.97   20826.5   31400.00
      7    25136.99   83.01    0.740  0.30( 0.29) 0.97   26747.2   13100.00
```



```
      8    25428.64   90.02    0.706  0.30( 0.29) 0.97   29411.8   11801.00
      9    26647.64  107.39    0.656  0.30( 0.29) 0.97   37674.5   13510.00
     10    27326.78  114.95    0.634  0.30( 0.29) 0.97   41962.7   13010.00
     11    28039.91  120.80    0.619  0.30( 0.29) 0.97   45608.3   11330.00
     12    28595.10  128.85    0.605  0.30( 0.29) 0.97   50692.8   10630.00
     13    28319.63  134.49    0.596  0.30( 0.29) 0.97   53286.7   12330.00
     14    28043.06  141.14    0.584  0.30( 0.29) 0.98   56425.3   11600.00
     15    27650.64  146.97    0.575  0.30( 0.29) 0.98   58657.7   11111.00
     16    27214.23  153.19    0.564  0.30( 0.29) 0.98   60594.0   12201.00
     17    26272.06  162.29    0.549  0.30( 0.29) 0.98   62681.7   12231.00
     18    25411.81  169.96    0.536  0.30( 0.29) 0.98   64095.0   10400.00
     19    24040.48  181.65    0.518  0.30( 0.29) 0.98   65712.2   10320.00
     20    22747.17  191.69    0.510  0.30( 0.29) 0.98   66101.5   12000.00
     21    19760.79  221.74    0.487  0.30( 0.29) 0.98   66719.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      489.67   23.75    1.431  0.30( 0.28) 0.95     474.8   10300.00
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  13740.00 =    8072.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16722.30   23.75    1.431  0.30( 0.29) 0.97    4363.2   10300.00
      2    17296.87   27.67    1.307  0.30( 0.29) 0.98    5005.6   21100.00
      3    17559.37   28.89    1.274  0.30( 0.29) 0.98    5384.7   10200.00
      4    19662.80   38.74    1.083  0.30( 0.29) 0.98    8375.3   20700.00
      5    21014.65   47.39    0.973  0.30( 0.29) 0.98   11260.5   10100.00
      6    22531.11   56.46    0.885  0.30( 0.29) 0.97   15164.2   20300.00
      7    24244.37   69.96    0.805  0.30( 0.29) 0.97   21301.3   31400.00
      8    25331.71   83.01    0.740  0.30( 0.29) 0.97   27222.0   13100.00
      9    25608.60   90.02    0.706  0.30( 0.29) 0.97   29886.5   11801.00
     10    26806.33  107.39    0.656  0.30( 0.29) 0.97   38149.3   13510.00
     11    27476.21  114.95    0.634  0.30( 0.29) 0.97   42437.5   13010.00
     12    28182.58  120.80    0.619  0.30( 0.29) 0.97   46083.0   11330.00
     13    28731.98  128.85    0.605  0.30( 0.29) 0.97   51167.6   10630.00
     14    28452.46  134.49    0.596  0.30( 0.29) 0.97   53761.4   12330.00
     15    28171.10  141.14    0.584  0.30( 0.29) 0.98   56900.1   11600.00
     16    27774.48  146.97    0.575  0.30( 0.29) 0.98   59132.5   11111.00
     17    27333.60  153.19    0.564  0.30( 0.29) 0.98   61068.7   12201.00
     18    26384.89  162.29    0.549  0.30( 0.29) 0.98   63156.4   12231.00
     19    25519.12  169.96    0.536  0.30( 0.29) 0.98   64569.8   10400.00
     20    24140.03  181.65    0.518  0.30( 0.29) 0.98   66187.0   10320.00
     21    22843.38  191.69    0.510  0.30( 0.29) 0.98   66576.3   12000.00
     22    19847.02  221.74    0.487  0.30( 0.29) 0.98   67194.1   10100.00
    TOTAL AREA(ACRES) =     67194.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    28731.98  Tc(MIN.) =  128.854
  EFFECTIVE AREA(ACRES) =  51167.60  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67194.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13741.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    161.63  DOWNSTREAM(FEET) =    141.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   389.20   CHANNEL SLOPE =  0.0530
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.53
  CHANNEL FLOW THRU SUBAREA(CFS) =   28731.98
  FLOW VELOCITY(FEET/SEC.) =  34.90   FLOW DEPTH(FEET) =   6.53
  TRAVEL TIME(MIN.) =   0.19   Tc(MIN.) =  129.04
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13741.00 =  128875.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13741.00 TO NODE  13802.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    141.00  DOWNSTREAM(FEET) =    135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1533.41   CHANNEL SLOPE =  0.0039
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.30
  CHANNEL FLOW THRU SUBAREA(CFS) =   28731.98
  FLOW VELOCITY(FEET/SEC.) =  14.11   FLOW DEPTH(FEET) =  13.30
  TRAVEL TIME(MIN.) =   1.81   Tc(MIN.) =  130.85
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509104V.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      493.33   32.61  0.30( 0.28) 0.94     599.8   10400.00
    TOTAL AREA(ACRES) =      599.8

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16722.30   26.10    1.351  0.30( 0.29) 0.97    4363.2   10300.00
```



```
      2    17296.87   29.99    1.243  0.30( 0.29) 0.98    5005.6   21100.00
      3    17559.37   31.20    1.221  0.30( 0.29) 0.98    5384.7   10200.00
      4    19662.80   40.97    1.049  0.30( 0.29) 0.98    8375.3   20700.00
      5    21014.65   49.58    0.947  0.30( 0.29) 0.98   11260.5   10100.00
      6    22531.11   58.61    0.866  0.30( 0.29) 0.97   15164.2   20300.00
      7    24244.37   72.06    0.794  0.30( 0.29) 0.97   21301.3   31400.00
      8    25331.71   85.08    0.730  0.30( 0.29) 0.97   27222.0   13100.00
      9    25608.60   92.09    0.700  0.30( 0.29) 0.97   29886.5   11801.00
     10    26806.33  109.43    0.650  0.30( 0.29) 0.97   38149.3   13510.00
     11    27476.21  116.97    0.629  0.30( 0.29) 0.97   42437.5   13010.00
     12    28182.58  122.81    0.615  0.30( 0.29) 0.97   46083.0   11330.00
     13    28731.98  130.85    0.602  0.30( 0.29) 0.97   51167.6   10630.00
     14    28452.46  136.49    0.592  0.30( 0.29) 0.97   53761.4   12330.00
     15    28171.10  143.15    0.581  0.30( 0.29) 0.98   56900.1   11600.00
     16    27774.48  148.99    0.571  0.30( 0.29) 0.98   59132.5   11111.00
     17    27333.60  155.21    0.561  0.30( 0.29) 0.98   61068.7   12201.00
     18    26384.89  164.34    0.545  0.30( 0.29) 0.98   63156.4   12231.00
     19    25519.12  172.03    0.532  0.30( 0.29) 0.98   64569.8   10400.00
     20    24140.03  183.75    0.516  0.30( 0.29) 0.98   66187.0   10320.00
     21    22843.38  193.83    0.508  0.30( 0.29) 0.98   66576.3   12000.00
     22    19847.02  223.97    0.485  0.30( 0.29) 0.98   67194.1   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      493.33   32.61    1.195  0.30( 0.28) 0.94     599.8   10400.00
LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  13802.00 =   12273.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    17184.29   26.10    1.351  0.30( 0.29) 0.97    4843.2   10300.00
    2    17774.44   29.99    1.243  0.30( 0.29) 0.97    5557.3   21100.00
    3    18044.73   31.20    1.221  0.30( 0.29) 0.97    5958.6   10200.00
    4    18355.05   32.61    1.195  0.30( 0.29) 0.97    6414.3   10400.00
    5    20076.89   40.97    1.049  0.30( 0.29) 0.97    8975.0   20700.00
    6    21373.89   49.58    0.947  0.30( 0.29) 0.98   11860.3   10100.00
    7    22846.80   58.61    0.866  0.30( 0.29) 0.97   15764.0   20300.00
    8    24521.33   72.06    0.794  0.30( 0.29) 0.97   21901.0   31400.00
    9    25573.99   85.08    0.730  0.30( 0.29) 0.96   27821.8   13100.00
   10    25834.55   92.09    0.700  0.30( 0.29) 0.97   30486.3   11801.00
   11    27005.43  109.43    0.650  0.30( 0.29) 0.97   38749.1   13510.00
   12    27663.64  116.97    0.629  0.30( 0.29) 0.97   43037.2   13010.00
   13    28362.78  122.81    0.615  0.30( 0.29) 0.97   46682.8   11330.00
   14    28904.87  130.85    0.602  0.30( 0.29) 0.97   51767.4   10630.00
   15    28620.21  136.49    0.592  0.30( 0.29) 0.97   54361.2   12330.00
   16    28332.81  143.15    0.581  0.30( 0.29) 0.97   57499.8   11600.00
   17    27930.89  148.99    0.571  0.30( 0.29) 0.98   59732.3   11111.00
   18    27484.35  155.21    0.561  0.30( 0.29) 0.98   61668.5   12201.00
   19    26527.34  164.34    0.545  0.30( 0.29) 0.98   63756.2   12231.00
   20    25654.59  172.03    0.532  0.30( 0.29) 0.98   65169.5   10400.00
   21    24266.67  183.75    0.516  0.30( 0.29) 0.98   66786.7   10320.00
   22    22965.79  193.83    0.508  0.30( 0.29) 0.98   67176.1   12000.00
   23    19956.78  223.97    0.485  0.30( 0.29) 0.98   67793.9   10100.00
  TOTAL AREA(ACRES) =     67793.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =    28904.87  Tc(MIN.) =  130.852
  EFFECTIVE AREA(ACRES) =  51767.38  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67793.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13803.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    135.00  DOWNSTREAM(FEET) =    133.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   207.23   CHANNEL SLOPE =  0.0097
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.48
  CHANNEL FLOW THRU SUBAREA(CFS) =   28904.87
  FLOW VELOCITY(FEET/SEC.) =  19.43   FLOW DEPTH(FEET) =  10.48
  TRAVEL TIME(MIN.) =   0.18   Tc(MIN.) =  131.03
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13803.00 =  130616.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13803.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    67793.9  TC(MIN.) =    131.03
  EFFECTIVE AREA(ACRES) =  51767.38  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.973
  PEAK FLOW RATE(CFS)   =   28904.87

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    17184.29   26.30    1.345  0.30( 0.29) 0.97    4843.2   10300.00
      2    17774.44   30.20    1.239  0.30( 0.29) 0.97    5557.3   21100.00
      3    18044.73   31.41    1.217  0.30( 0.29) 0.97    5958.6   10200.00
      4    18355.05   32.81    1.192  0.30( 0.29) 0.97    6414.3   10400.00
      5    20076.89   41.17    1.046  0.30( 0.29) 0.97    8975.0   20700.00
      6    21373.89   49.78    0.945  0.30( 0.29) 0.98   11860.3   10100.00
      7    22846.80   58.80    0.865  0.30( 0.29) 0.97   15764.0   20300.00
      8    24521.33   72.25    0.794  0.30( 0.29) 0.97   21901.0   31400.00
      9    25573.99   85.26    0.729  0.30( 0.29) 0.96   27821.8   13100.00
     10    25834.55   92.27    0.699  0.30( 0.29) 0.97   30486.3   11801.00
     11    27005.43  109.61    0.650  0.30( 0.29) 0.97   38749.1   13510.00
     12    27663.64  117.15    0.628  0.30( 0.29) 0.97   43037.2   13010.00
     13    28362.78  122.98    0.615  0.30( 0.29) 0.97   46682.8   11330.00
     14    28904.87  131.03    0.601  0.30( 0.29) 0.97   51767.4   10630.00
     15    28620.21  136.67    0.592  0.30( 0.29) 0.97   54361.2   12330.00
     16    28332.81  143.32    0.581  0.30( 0.29) 0.97   57499.8   11600.00
     17    27930.89  149.17    0.571  0.30( 0.29) 0.98   59732.3   11111.00
     18    27484.35  155.39    0.560  0.30( 0.29) 0.98   61668.5   12201.00
     19    26527.34  164.52    0.545  0.30( 0.29) 0.98   63756.2   12231.00
     20    25654.59  172.21    0.532  0.30( 0.29) 0.98   65169.5   10400.00
     21    24266.67  183.94    0.516  0.30( 0.29) 0.98   66786.7   10320.00
```



```
     22    22965.79  194.02    0.508  0.30( 0.29) 0.98   67176.1   12000.00
     23    19956.78  224.16    0.485  0.30( 0.29) 0.98   67793.9   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:
```

FILE NAME: S38.DAT
TIME/DATE OF STUDY: 09:05 09/12/2017

==========

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

==========

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
USER-DEFINED TABLED RAINFALL USED
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	3.698
2)	10.00;	2.475
3)	15.00;	1.846
4)	20.00;	1.578
5)	25.00;	1.379
6)	30.00;	1.242
7)	40.00;	1.059
8)	50.00;	0.941
9)	60.00;	0.852
10)	90.00;	0.704
11)	120.00;	0.619
12)	180.00;	0.517
13)	360.00;	0.378
14)	1200.00;	0.165

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****

FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<

==========

PEAK FLOWRATE TABLE FILE NAME: S37.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17184.29	26.30	0.30(0.29)	0.97	4843.2	10300.00
2	18355.05	32.81	0.30(0.29)	0.97	6414.3	10400.00
3	20076.89	41.17	0.30(0.29)	0.97	8975.0	20700.00
4	21373.89	49.78	0.30(0.29)	0.98	11860.3	10100.00
5	22846.80	58.80	0.30(0.29)	0.97	15764.0	20300.00
6	24521.33	72.25	0.30(0.29)	0.97	21901.0	31400.00
7	25573.99	85.26	0.30(0.29)	0.96	27821.8	13100.00
8	25834.55	92.27	0.30(0.29)	0.97	30486.3	11801.00
9	27005.43	109.61	0.30(0.29)	0.97	38749.1	13510.00
10	28362.78	122.98	0.30(0.29)	0.97	46682.8	11330.00
11	28904.87	131.03	0.30(0.29)	0.97	51767.4	10630.00
12	28620.21	136.67	0.30(0.29)	0.97	54361.2	12330.00
13	28332.81	143.32	0.30(0.29)	0.97	57499.8	11600.00
14	27930.89	149.17	0.30(0.29)	0.98	59732.3	11111.00
15	27484.35	155.39	0.30(0.29)	0.98	61668.5	12201.00
16	26527.34	164.52	0.30(0.29)	0.98	63756.2	12231.00
17	25654.59	172.21	0.30(0.29)	0.98	65169.5	10400.00
18	24266.67	183.94	0.30(0.29)	0.98	66786.7	10320.00
19	22965.79	194.02	0.30(0.29)	0.98	67176.1	12000.00
20	19956.78	224.16	0.30(0.29)	0.98	67793.9	10100.00

TOTAL AREA(ACRES) = 67793.9

****

FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 14.0

>>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

==========

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17184.29	26.30	0.30(0.29)	0.97	4843.2	10300.00
2	18355.05	32.81	0.30(0.29)	0.97	6414.3	10400.00
3	20076.89	41.17	0.30(0.29)	0.97	8975.0	20700.00
4	21373.89	49.78	0.30(0.29)	0.98	11860.3	10100.00
5	22846.80	58.80	0.30(0.29)	0.97	15764.0	20300.00
6	24521.33	72.25	0.30(0.29)	0.97	21901.0	31400.00
7	25573.99	85.26	0.30(0.29)	0.96	27821.8	13100.00
8	25834.55	92.27	0.30(0.29)	0.97	30486.3	11801.00
9	27005.43	109.61	0.30(0.29)	0.97	38749.1	13510.00
10	28362.78	122.98	0.30(0.29)	0.97	46682.8	11330.00
11	28904.87	131.03	0.30(0.29)	0.97	51767.4	10630.00
12	28620.21	136.67	0.30(0.29)	0.97	54361.2	12330.00
13	28332.81	143.32	0.30(0.29)	0.97	57499.8	11600.00
14	27930.89	149.17	0.30(0.29)	0.98	59732.3	11111.00
15	27484.35	155.39	0.30(0.29)	0.98	61668.5	12201.00
16	26527.34	164.52	0.30(0.29)	0.98	63756.2	12231.00
17	25654.59	172.21	0.30(0.29)	0.98	65169.5	10400.00
18	24266.67	183.94	0.30(0.29)	0.98	66786.7	10320.00

```
     19    22965.79  194.02  0.30( 0.29) 0.98   67176.1   12000.00
     20    19956.78  224.16  0.30( 0.29) 0.98   67793.9   10100.00
    TOTAL AREA(ACRES) =     67793.9

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    140.00  DOWNSTREAM(FEET) =    137.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.91   CHANNEL SLOPE =  0.0032
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  14.03
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.598
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.70      0.30     0.983     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.983
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   28912.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.21
  AVERAGE FLOW DEPTH(FEET) =  14.02   TRAVEL TIME(MIN.) =   1.17
  Tc(MIN.) =  132.20
  SUBAREA AREA(ACRES) =    53.70       SUBAREA RUNOFF(CFS) =   14.66
  EFFECTIVE AREA(ACRES) =  51821.08     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    67847.6         PEAK FLOW RATE(CFS) =   28904.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  14.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 14.02   FLOW VELOCITY(FEET/SEC.) =  13.21
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13820.00 =  131542.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  132.20
  RAINFALL INTENSITY(INCH/HR) =   0.60
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   51821.08
  TOTAL STREAM AREA(ACRES) =   67847.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   28904.87

****************************************************************************
  FLOW PROCESS FROM NODE  13810.00 TO NODE  13811.00 IS CODE =  21
----------------------------------------------------------------------------
```



```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   648.54
  ELEVATION DATA: UPSTREAM(FEET) =    756.46  DOWNSTREAM(FEET) =    586.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.293
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.187
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.58      0.30     1.000     0   12.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.47
  TOTAL AREA(ACRES) =      5.58   PEAK FLOW RATE(CFS) =      9.47

****************************************************************************
  FLOW PROCESS FROM NODE  13811.00 TO NODE  13811.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    586.02  DOWNSTREAM(FEET) =    437.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =   696.28   CHANNEL SLOPE =  0.2130
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.914
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.79      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.35
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   2.17
  Tc(MIN.) =   14.46
  SUBAREA AREA(ACRES) =    14.79       SUBAREA RUNOFF(CFS) =   21.48
  EFFECTIVE AREA(ACRES) =     20.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      29.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.44   FLOW VELOCITY(FEET/SEC.) =   6.19
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13811.50 =    1344.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13811.50 TO NODE  13812.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    437.69  DOWNSTREAM(FEET) =    402.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   681.04   CHANNEL SLOPE =  0.0519
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.737
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.40
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   2.58
  Tc(MIN.) =   17.04
  SUBAREA AREA(ACRES) =    18.41       SUBAREA RUNOFF(CFS) =   23.81
  EFFECTIVE AREA(ACRES) =     38.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.8         PEAK FLOW RATE(CFS) =      50.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   4.70
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13812.00 =    2025.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13812.00 TO NODE  13813.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    402.36  DOWNSTREAM(FEET) =    259.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1282.56   CHANNEL SLOPE =  0.1112
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.568
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.87      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      66.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.68
  AVERAGE FLOW DEPTH(FEET) =   0.85   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   20.24
  SUBAREA AREA(ACRES) =    27.87       SUBAREA RUNOFF(CFS) =   32.89
  EFFECTIVE AREA(ACRES) =     66.65     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =      77.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
```



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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   7.01
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13813.00 =    3308.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   259.72  DOWNSTREAM(FEET) =   137.00
  FLOW LENGTH(FEET) =  2412.88   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  18.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.58
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      77.16
  PIPE TRAVEL TIME(MIN.) =   1.95    Tc(MIN.) =   22.19
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13820.00 =    5721.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   22.19
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.491
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.54      0.30     0.570     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.570
  SUBAREA AREA(ACRES) =   82.54       SUBAREA RUNOFF(CFS) =   98.04
  EFFECTIVE AREA(ACRES) =    149.19   AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =      149.2       PEAK FLOW RATE(CFS) =     170.54

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.19
  RAINFALL INTENSITY(INCH/HR) =   1.49
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.74
  EFFECTIVE STREAM AREA(ACRES) =     149.19
  TOTAL STREAM AREA(ACRES) =     149.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     170.54

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	17184.29	27.66	1.306	0.30(0.29)	0.97	4896.9	10300.00
1	18355.05	34.15	1.166	0.30(0.29)	0.97	6468.0	10400.00
1	20076.89	42.47	1.030	0.30(0.29)	0.97	9028.7	20700.00
1	21373.89	51.06	0.932	0.30(0.29)	0.98	11914.0	10100.00
1	22846.80	60.05	0.852	0.30(0.29)	0.97	15817.7	20300.00
1	24521.33	73.47	0.786	0.30(0.29)	0.97	21954.7	31400.00
1	25573.99	86.48	0.721	0.30(0.29)	0.96	27875.5	13100.00
1	25834.55	93.48	0.694	0.30(0.29)	0.97	30540.0	11801.00
1	27005.43	110.81	0.645	0.30(0.29)	0.97	38802.8	13510.00
1	28362.78	124.16	0.612	0.30(0.29)	0.97	46736.5	11330.00
1	28904.87	132.20	0.598	0.30(0.29)	0.97	51821.1	10630.00
1	28620.21	137.84	0.589	0.30(0.29)	0.97	54414.9	12330.00
1	28332.81	144.50	0.577	0.30(0.29)	0.97	57553.5	11600.00
1	27930.89	150.35	0.567	0.30(0.29)	0.98	59786.0	11111.00
1	27484.35	156.58	0.557	0.30(0.29)	0.98	61722.2	12201.00
1	26527.34	165.72	0.541	0.30(0.29)	0.98	63809.9	12231.00
1	25654.59	173.42	0.528	0.30(0.29)	0.98	65223.2	10400.00
1	24266.67	185.17	0.513	0.30(0.29)	0.98	66840.4	10320.00
1	22965.79	195.27	0.505	0.30(0.29)	0.98	67229.8	12000.00
1	19956.78	225.47	0.482	0.30(0.29)	0.98	67847.6	10100.00
2	170.54	22.19	1.491	0.30(0.22)	0.74	149.2	13810.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)		Ap	Ae (ACRES)	HEADWATER NODE
1	16465.67	22.19	1.491	0.30(0.29)	0.96	4077.5	13810.00
2	17330.02	27.66	1.306	0.30(0.29)	0.96	5046.0	10300.00
3	18482.00	34.15	1.166	0.30(0.29)	0.97	6617.2	10400.00
4	20185.55	42.47	1.030	0.30(0.29)	0.97	9177.9	20700.00
5	21469.35	51.06	0.932	0.30(0.29)	0.97	12063.1	10100.00
6	22931.54	60.05	0.852	0.30(0.29)	0.97	15966.9	20300.00
7	24597.18	73.47	0.786	0.30(0.29)	0.97	22103.9	31400.00
8	25641.23	86.48	0.721	0.30(0.29)	0.96	28024.6	13100.00
9	25898.13	93.48	0.694	0.30(0.29)	0.96	30689.2	11801.00
10	27062.42	110.81	0.645	0.30(0.29)	0.97	38951.9	13510.00
11	28415.32	124.16	0.612	0.30(0.29)	0.97	46885.7	11330.00
12	28955.57	132.20	0.598	0.30(0.29)	0.97	51970.3	10630.00
13	28669.63	137.84	0.589	0.30(0.29)	0.97	54564.1	12330.00
14	28380.71	144.50	0.577	0.30(0.29)	0.97	57702.7	11600.00
15	27977.45	150.35	0.567	0.30(0.29)	0.97	59935.2	11111.00
16	27529.49	156.58	0.557	0.30(0.29)	0.97	61871.4	12201.00
17	26570.40	165.72	0.541	0.30(0.29)	0.98	63959.1	12231.00
18	25695.88	173.42	0.528	0.30(0.29)	0.98	65372.4	10400.00
19	24305.93	185.17	0.513	0.30(0.29)	0.98	66989.6	10320.00
20	23004.01	195.27	0.505	0.30(0.29)	0.98	67379.0	12000.00
21	19991.86	225.47	0.482	0.30(0.29)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 28955.57 Tc(MIN.) = 132.20
EFFECTIVE AREA(ACRES) = 51970.27 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 67996.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.


```
****************************************************************************
  FLOW PROCESS FROM NODE  13820.00 TO NODE  13840.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    137.00  DOWNSTREAM(FEET) =    133.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1261.34   CHANNEL SLOPE =  0.0032
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  14.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.596
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.60      0.30      0.683     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.683
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   28961.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.12
  AVERAGE FLOW DEPTH(FEET) =  14.11   TRAVEL TIME(MIN.) =   1.60
  Tc(MIN.) =  133.80
  SUBAREA AREA(ACRES) =    31.60       SUBAREA RUNOFF(CFS) =   11.11
  EFFECTIVE AREA(ACRES) =  52001.87     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    68028.3         PEAK FLOW RATE(CFS) =   28955.57
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  14.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 14.11   FLOW VELOCITY(FEET/SEC.) =  13.12
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13840.00 =  132804.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13820.00 TO NODE  13840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  133.80
  RAINFALL INTENSITY(INCH/HR) =   0.60
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52001.87
  TOTAL STREAM AREA(ACRES) =   68028.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   28955.57

****************************************************************************
  FLOW PROCESS FROM NODE  13830.00 TO NODE  13831.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   744.71
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```
 ELEVATION DATA: UPSTREAM(FEET) =   1100.95  DOWNSTREAM(FEET) =    959.21

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.858
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.990
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,BROADLEAF"      -        5.06      0.30     1.000     0   13.86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      7.70
 TOTAL AREA(ACRES) =      5.06   PEAK FLOW RATE(CFS) =      7.70

****************************************************************************
 FLOW PROCESS FROM NODE  13831.00 TO NODE  13832.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    959.21  DOWNSTREAM(FEET) =    832.83
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1076.71   CHANNEL SLOPE =  0.1174
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.716
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       32.57      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.04
 AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   3.56
 Tc(MIN.) =   17.42
 SUBAREA AREA(ACRES) =    32.57       SUBAREA RUNOFF(CFS) =   41.52
 EFFECTIVE AREA(ACRES) =     37.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =      47.97
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   6.04
 LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13832.00 =    1821.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13832.00 TO NODE  13833.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    832.83  DOWNSTREAM(FEET) =    572.49
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.58   CHANNEL SLOPE =  0.1382
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```



```
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.81
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.505
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       32.23      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.50
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.10
 AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   4.42
 Tc(MIN.) =   21.84
 SUBAREA AREA(ACRES) =    32.23       SUBAREA RUNOFF(CFS) =   34.95
 EFFECTIVE AREA(ACRES) =     69.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       69.9         PEAK FLOW RATE(CFS) =      75.75
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   7.47
 LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13833.00 =    3705.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13833.00 TO NODE  13834.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    572.49  DOWNSTREAM(FEET) =    471.65
 CHANNEL LENGTH THRU SUBAREA(FEET) =   943.78   CHANNEL SLOPE =  0.1068
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.418
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       27.51      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      89.60
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.25
 AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   2.17
 Tc(MIN.) =   24.01
 SUBAREA AREA(ACRES) =    27.51       SUBAREA RUNOFF(CFS) =   27.69
 EFFECTIVE AREA(ACRES) =     97.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =      98.02
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.08

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   7.46
 LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13834.00 =    4648.78 FEET.
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****************************************************************************
  FLOW PROCESS FROM NODE  13834.00 TO NODE  13835.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    471.65  DOWNSTREAM(FEET) =    347.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1647.45   CHANNEL SLOPE =  0.0756
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.49
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.305
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     140.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.45
  AVERAGE FLOW DEPTH(FEET) =   1.46   TRAVEL TIME(MIN.) =   3.69
  Tc(MIN.) =   27.70
  SUBAREA AREA(ACRES) =    94.21       SUBAREA RUNOFF(CFS) =   85.23
  EFFECTIVE AREA(ACRES) =    191.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      191.6         PEAK FLOW RATE(CFS) =     173.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.64   FLOW VELOCITY(FEET/SEC.) =   7.94
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13835.00 =    6296.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13835.00 TO NODE  13836.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    347.06  DOWNSTREAM(FEET) =    269.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1696.71   CHANNEL SLOPE =  0.0458
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.216
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      233.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     269.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.59
  AVERAGE FLOW DEPTH(FEET) =   2.40   TRAVEL TIME(MIN.) =   3.72
  Tc(MIN.) =   31.42
  SUBAREA AREA(ACRES) =   233.25       SUBAREA RUNOFF(CFS) =  192.31
```



```
  EFFECTIVE AREA(ACRES) =    424.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      424.8         PEAK FLOW RATE(CFS) =     350.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.76   FLOW VELOCITY(FEET/SEC.) =   8.18
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13836.00 =    7992.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13836.00 TO NODE  13837.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    269.29  DOWNSTREAM(FEET) =    191.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2529.21   CHANNEL SLOPE =  0.0306
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.111
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.70      0.30     0.880     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     401.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.35
  AVERAGE FLOW DEPTH(FEET) =   3.29   TRAVEL TIME(MIN.) =   5.73
  Tc(MIN.) =   37.15
  SUBAREA AREA(ACRES) =   134.70       SUBAREA RUNOFF(CFS) =  102.70
  EFFECTIVE AREA(ACRES) =    559.53     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      559.5         PEAK FLOW RATE(CFS) =     412.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.34   FLOW VELOCITY(FEET/SEC.) =   7.41
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13837.00 =   10522.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   191.87  DOWNSTREAM(FEET) =   133.00
  FLOW LENGTH(FEET) =  1151.02   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  43.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.24
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     412.84
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =   37.79
```

LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13840.00 = 11673.17 FEET.

****
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
MAINLINE Tc(MIN.) = 37.79
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.099
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.97	0.30	0.622	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.622
SUBAREA AREA(ACRES) = 5.97 SUBAREA RUNOFF(CFS) = 4.91
EFFECTIVE AREA(ACRES) = 565.50 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 565.5 PEAK FLOW RATE(CFS) = 412.84
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 37.79
RAINFALL INTENSITY(INCH/HR) = 1.10
AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97
EFFECTIVE STREAM AREA(ACRES) = 565.50
TOTAL STREAM AREA(ACRES) = 565.50
PEAK FLOW RATE(CFS) AT CONFLUENCE = 412.84

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16465.67	24.08	1.416	0.30(0.29)	0.96	4109.1	13810.00
1	17330.02	29.53	1.255	0.30(0.29)	0.96	5077.6	10300.00
1	18482.00	35.97	1.133	0.30(0.29)	0.97	6648.8	10400.00
1	20185.55	44.25	1.009	0.30(0.29)	0.97	9209.5	20700.00
1	21469.35	52.80	0.916	0.30(0.29)	0.97	12094.7	10100.00
1	22931.54	61.77	0.843	0.30(0.29)	0.97	15998.5	20300.00
1	24597.18	75.15	0.777	0.30(0.29)	0.97	22135.5	31400.00
1	25641.23	88.14	0.713	0.30(0.29)	0.96	28056.2	13100.00
1	25898.13	95.13	0.689	0.30(0.29)	0.96	30720.8	11801.00
1	27062.42	112.44	0.640	0.30(0.29)	0.97	38983.6	13510.00
1	28415.32	125.77	0.609	0.30(0.29)	0.97	46917.3	11330.00
1	28955.57	133.80	0.596	0.30(0.29)	0.97	52001.9	10630.00
1	28669.63	139.45	0.586	0.30(0.29)	0.97	54595.7	12330.00
1	28380.71	146.11	0.575	0.30(0.29)	0.97	57734.3	11600.00
1	27977.45	151.97	0.565	0.30(0.29)	0.97	59966.8	11111.00
1	27529.49	158.21	0.554	0.30(0.29)	0.97	61903.0	12201.00
1	26570.40	167.36	0.538	0.30(0.29)	0.97	63990.7	12231.00

1	25695.88	175.08	0.525	0.30(0.29)	0.98	65404.0	10400.00
1	24305.93	186.86	0.512	0.30(0.29)	0.98	67021.2	10320.00
1	23004.01	196.98	0.504	0.30(0.29)	0.98	67410.6	12000.00
1	19991.86	227.25	0.481	0.30(0.29)	0.98	68028.3	10100.00
2	412.84	37.79	1.099	0.30(0.29)	0.97	565.5	13830.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16831.52	24.08	1.416	0.30(0.29)	0.96	4469.5	13810.00
2	17714.58	29.53	1.255	0.30(0.29)	0.96	5519.5	10300.00
3	18891.14	35.97	1.133	0.30(0.29)	0.97	7187.2	10400.00
4	19268.28	37.79	1.099	0.30(0.29)	0.97	7775.7	13830.00
5	20552.14	44.25	1.009	0.30(0.29)	0.97	9775.0	20700.00
6	21788.62	52.80	0.916	0.30(0.29)	0.97	12660.2	10100.00
7	23213.70	61.77	0.843	0.30(0.29)	0.97	16564.0	20300.00
8	24845.64	75.15	0.777	0.30(0.29)	0.97	22701.0	31400.00
9	25857.03	88.14	0.713	0.30(0.29)	0.96	28621.7	13100.00
10	26101.82	95.13	0.689	0.30(0.29)	0.96	31286.3	11801.00
11	27241.09	112.44	0.640	0.30(0.29)	0.97	39549.1	13510.00
12	28578.06	125.77	0.609	0.30(0.29)	0.97	47482.8	11330.00
13	29111.35	133.80	0.596	0.30(0.29)	0.97	52567.4	10630.00
14	28820.51	139.45	0.586	0.30(0.29)	0.97	55161.2	12330.00
15	28525.81	146.11	0.575	0.30(0.29)	0.97	58299.8	11600.00
16	28117.47	151.97	0.565	0.30(0.29)	0.97	60532.3	11111.00
17	27664.10	158.21	0.554	0.30(0.29)	0.97	62468.5	12201.00
18	26697.07	167.36	0.538	0.30(0.29)	0.97	64556.2	12231.00
19	25815.86	175.08	0.525	0.30(0.29)	0.98	65969.5	10400.00
20	24418.94	186.86	0.512	0.30(0.29)	0.98	67586.7	10320.00
21	23113.03	196.98	0.504	0.30(0.29)	0.98	67976.1	12000.00
22	20088.96	227.25	0.481	0.30(0.29)	0.98	68593.8	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 29111.35 Tc(MIN.) = 133.80
EFFECTIVE AREA(ACRES) = 52567.37 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 68593.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

****
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 133.00 DOWNSTREAM(FEET) = 130.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.44 CHANNEL SLOPE = 0.0046
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.84
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.594
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.61	0.30	0.975	-

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.975
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29112.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.98
  AVERAGE FLOW DEPTH(FEET) =  12.84   TRAVEL TIME(MIN.) =   0.73
  Tc(MIN.) =  134.53
  SUBAREA AREA(ACRES) =     6.61       SUBAREA RUNOFF(CFS) =    1.80
  EFFECTIVE AREA(ACRES) =  52573.98     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    68600.5         PEAK FLOW RATE(CFS) =   29111.35
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.84   FLOW VELOCITY(FEET/SEC.) =  14.98
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13860.00 =  133458.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13840.00 TO NODE  13860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  134.53
  RAINFALL INTENSITY(INCH/HR) =   0.59
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52573.98
  TOTAL STREAM AREA(ACRES) =   68600.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   29111.35

****************************************************************************
  FLOW PROCESS FROM NODE  13850.00 TO NODE  13851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   617.57
  ELEVATION DATA: UPSTREAM(FEET) =    646.95  DOWNSTREAM(FEET) =    490.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.137
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.206
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        4.95      0.30     1.000     0   12.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.49
  TOTAL AREA(ACRES) =      4.95   PEAK FLOW RATE(CFS) =      8.49

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  13851.00 TO NODE  13851.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.10  DOWNSTREAM(FEET) =    440.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   351.14   CHANNEL SLOPE =  0.1399
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.015
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.85
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.52
  Tc(MIN.) =   13.66
  SUBAREA AREA(ACRES) =     4.02       SUBAREA RUNOFF(CFS) =    6.20
  EFFECTIVE AREA(ACRES) =      8.97     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.0         PEAK FLOW RATE(CFS) =      13.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   4.10
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13851.50 =     968.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13851.50 TO NODE  13852.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    440.98  DOWNSTREAM(FEET) =    395.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.91   CHANNEL SLOPE =  0.0882
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.803
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.17      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.98
  AVERAGE FLOW DEPTH(FEET) =   0.43   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   15.80
  SUBAREA AREA(ACRES) =     7.17       SUBAREA RUNOFF(CFS) =    9.70
  EFFECTIVE AREA(ACRES) =     16.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =       16.1         PEAK FLOW RATE(CFS) =      21.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.48   FLOW VELOCITY(FEET/SEC.) =   4.19
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13852.00 =    1481.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13852.00 TO NODE  13853.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    395.76  DOWNSTREAM(FEET) =    354.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   443.69   CHANNEL SLOPE =  0.0920
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.715
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.76      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.52
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   1.64
  Tc(MIN.) =   17.44
  SUBAREA AREA(ACRES) =     6.76       SUBAREA RUNOFF(CFS) =    8.61
  EFFECTIVE AREA(ACRES) =     22.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.9         PEAK FLOW RATE(CFS) =      29.17
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   4.69
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13853.00 =    1925.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13853.00 TO NODE  13854.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    354.94  DOWNSTREAM(FEET) =    263.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.09   CHANNEL SLOPE =  0.0950
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.67
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.559
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       18.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.29
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   3.03
  Tc(MIN.) =   20.47
  SUBAREA AREA(ACRES) =    18.16       SUBAREA RUNOFF(CFS) =   20.58
  EFFECTIVE AREA(ACRES) =     41.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.1         PEAK FLOW RATE(CFS) =      46.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.73   FLOW VELOCITY(FEET/SEC.) =   5.58
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13854.00 =    2887.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13854.00 TO NODE  13855.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    263.57  DOWNSTREAM(FEET) =    188.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1228.77   CHANNEL SLOPE =  0.0609
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.409
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.75      0.30     0.879     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.879
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      66.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.43
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   3.77
  Tc(MIN.) =   24.24
  SUBAREA AREA(ACRES) =    38.75       SUBAREA RUNOFF(CFS) =   39.95
  EFFECTIVE AREA(ACRES) =     79.81     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       79.8         PEAK FLOW RATE(CFS) =      80.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =   5.82
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13855.00 =    4116.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

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================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   188.74  DOWNSTREAM(FEET) =   130.00
  FLOW LENGTH(FEET) =  2092.67   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  23.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.52
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      80.95
  PIPE TRAVEL TIME(MIN.) =   2.11    Tc(MIN.) =   26.35
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13860.00 =    6208.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.35
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.342
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.41      0.30     0.707     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.707
  SUBAREA AREA(ACRES) =   43.41      SUBAREA RUNOFF(CFS) =   44.14
  EFFECTIVE AREA(ACRES) =    123.22   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      123.2       PEAK FLOW RATE(CFS) =     120.26

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.35
  RAINFALL INTENSITY(INCH/HR) =   1.34
  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.86
  EFFECTIVE STREAM AREA(ACRES) =     123.22
  TOTAL STREAM AREA(ACRES) =     123.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     120.26

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16831.52   24.94    1.381  0.30( 0.29) 0.96    4476.1   13810.00
      1    17714.58   30.37    1.235  0.30( 0.29) 0.96    5526.1   10300.00
      1    18891.14   36.80    1.118  0.30( 0.29) 0.97    7193.8   10400.00
      1    19268.28   38.61    1.084  0.30( 0.29) 0.97    7782.3   13830.00
      1    20552.14   45.06    0.999  0.30( 0.29) 0.97    9781.6   20700.00
      1    21788.62   53.60    0.909  0.30( 0.29) 0.97   12666.9   10100.00
      1    23213.70   62.54    0.839  0.30( 0.29) 0.97   16570.6   20300.00
      1    24845.64   75.92    0.773  0.30( 0.29) 0.97   22707.6   31400.00
      1    25857.03   88.89    0.709  0.30( 0.29) 0.96   28628.3   13100.00
```



```
      1    26101.82   95.89    0.687  0.30( 0.29) 0.96   31292.9   11801.00
      1    27241.09  113.18    0.638  0.30( 0.29) 0.97   39555.7   13510.00
      1    28578.06  126.50    0.608  0.30( 0.29) 0.97   47489.4   11330.00
      1    29111.35  134.53    0.594  0.30( 0.29) 0.97   52574.0   10630.00
      1    28820.51  140.18    0.585  0.30( 0.29) 0.97   55167.8   12330.00
      1    28525.81  146.84    0.573  0.30( 0.29) 0.97   58306.4   11600.00
      1    28117.47  152.71    0.563  0.30( 0.29) 0.97   60538.9   11111.00
      1    27664.10  158.95    0.553  0.30( 0.29) 0.97   62475.1   12201.00
      1    26697.07  168.11    0.537  0.30( 0.29) 0.97   64562.8   12231.00
      1    25815.86  175.84    0.524  0.30( 0.29) 0.98   65976.1   10400.00
      1    24418.94  187.62    0.511  0.30( 0.29) 0.98   67593.3   10320.00
      1    23113.03  197.76    0.503  0.30( 0.29) 0.98   67982.7   12000.00
      1    20088.96  228.06    0.480  0.30( 0.29) 0.98   68600.5   10100.00
      2      120.26   26.35    1.342  0.30( 0.26) 0.86     123.2   13850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16949.47   24.94    1.381  0.30( 0.29) 0.96    4592.7   13810.00
      2    17181.46   26.35    1.342  0.30( 0.29) 0.96    4872.4   13850.00
      3    17823.00   30.37    1.235  0.30( 0.29) 0.96    5649.3   10300.00
      4    18986.51   36.80    1.118  0.30( 0.29) 0.96    7317.0   10400.00
      5    19359.97   38.61    1.084  0.30( 0.29) 0.96    7905.5   13830.00
      6    20634.40   45.06    0.999  0.30( 0.29) 0.97    9904.9   20700.00
      7    21860.87   53.60    0.909  0.30( 0.29) 0.97   12790.1   10100.00
      8    23278.23   62.54    0.839  0.30( 0.29) 0.97   16693.8   20300.00
      9    24902.86   75.92    0.773  0.30( 0.29) 0.97   22830.9   31400.00
     10    25907.15   88.89    0.709  0.30( 0.29) 0.96   28751.6   13100.00
     11    26149.48   95.89    0.687  0.30( 0.29) 0.96   31416.1   11801.00
     12    27283.31  113.18    0.638  0.30( 0.29) 0.97   39678.9   13510.00
     13    28616.92  126.50    0.608  0.30( 0.29) 0.97   47612.6   11330.00
     14    29148.70  134.53    0.594  0.30( 0.29) 0.97   52697.2   10630.00
     15    28856.79  140.18    0.585  0.30( 0.29) 0.97   55291.0   12330.00
     16    28560.84  146.84    0.573  0.30( 0.29) 0.97   58429.7   11600.00
     17    28151.39  152.71    0.563  0.30( 0.29) 0.97   60662.1   11111.00
     18    27696.84  158.95    0.553  0.30( 0.29) 0.97   62598.3   12201.00
     19    26728.08  168.11    0.537  0.30( 0.29) 0.97   64686.0   12231.00
     20    25845.42  175.84    0.524  0.30( 0.29) 0.97   66099.4   10400.00
     21    24447.06  187.62    0.511  0.30( 0.29) 0.98   67716.6   10320.00
     22    23140.28  197.76    0.503  0.30( 0.29) 0.98   68105.9   12000.00
     23    20113.62  228.06    0.480  0.30( 0.29) 0.98   68723.7   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   29148.70    Tc(MIN.) =   134.53
  EFFECTIVE AREA(ACRES) =   52697.20   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68723.7
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13860.00 =  133458.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13860.00 TO NODE  13880.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    130.00  DOWNSTREAM(FEET) =    120.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   610.77   CHANNEL SLOPE =  0.0154
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.27
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.594
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29149.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  22.95
  AVERAGE FLOW DEPTH(FEET) =   9.27   TRAVEL TIME(MIN.) =   0.44
  Tc(MIN.) =  134.97
  SUBAREA AREA(ACRES) =     4.89       SUBAREA RUNOFF(CFS) =    1.29
  EFFECTIVE AREA(ACRES) =  52702.09     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    68728.6         PEAK FLOW RATE(CFS) =   29148.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.27   FLOW VELOCITY(FEET/SEC.) =  22.95
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13880.00 =  134069.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13860.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  134.97
  RAINFALL INTENSITY(INCH/HR) =   0.59
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52702.09
  TOTAL STREAM AREA(ACRES) =   68728.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   29148.70

****************************************************************************
  FLOW PROCESS FROM NODE  13870.00 TO NODE  13871.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   872.65
  ELEVATION DATA: UPSTREAM(FEET) =    558.52  DOWNSTREAM(FEET) =    436.47

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.704
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.808
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        9.32      0.30     1.000     0   15.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.65
  TOTAL AREA(ACRES) =      9.32   PEAK FLOW RATE(CFS) =     12.65

****************************************************************************
  FLOW PROCESS FROM NODE  13871.00 TO NODE  13872.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.47  DOWNSTREAM(FEET) =    337.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =   827.95   CHANNEL SLOPE =  0.1194
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.44
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.646
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.56
  AVERAGE FLOW DEPTH(FEET) =   0.43   TRAVEL TIME(MIN.) =   3.02
  Tc(MIN.) =   18.73
  SUBAREA AREA(ACRES) =    14.27       SUBAREA RUNOFF(CFS) =   17.29
  EFFECTIVE AREA(ACRES) =     23.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =      28.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.51   FLOW VELOCITY(FEET/SEC.) =   5.10
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13872.00 =    1700.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13872.00 TO NODE  13873.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    337.62  DOWNSTREAM(FEET) =    253.88
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1049.16   CHANNEL SLOPE =  0.0798
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.498
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -       35.74      0.30     0.923     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.923
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.34
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   22.00
  SUBAREA AREA(ACRES) =    35.74       SUBAREA RUNOFF(CFS) =   39.29
  EFFECTIVE AREA(ACRES) =     59.33     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =       59.3         PEAK FLOW RATE(CFS) =      64.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   5.90
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13873.00 =    2749.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13873.00 TO NODE  13874.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    253.88  DOWNSTREAM(FEET) =    160.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1518.60   CHANNEL SLOPE =  0.0613
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.370
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.43      0.30     0.900     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      80.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.63
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   3.32
  Tc(MIN.) =   25.31
  SUBAREA AREA(ACRES) =    32.43       SUBAREA RUNOFF(CFS) =   32.12
  EFFECTIVE AREA(ACRES) =     91.76     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       91.8         PEAK FLOW RATE(CFS) =      90.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   7.90
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13874.00 =    4268.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13874.00 TO NODE  13875.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    160.73  DOWNSTREAM(FEET) =    158.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   582.74   CHANNEL SLOPE =  0.0044
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.295
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.67      0.30     0.930     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.930
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     123.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.53
  AVERAGE FLOW DEPTH(FEET) =   2.38   TRAVEL TIME(MIN.) =   2.75
  Tc(MIN.) =   28.07
  SUBAREA AREA(ACRES) =    73.67       SUBAREA RUNOFF(CFS) =   67.36
  EFFECTIVE AREA(ACRES) =    165.43     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =      165.4         PEAK FLOW RATE(CFS) =     151.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.64   FLOW VELOCITY(FEET/SEC.) =   3.74
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13875.00 =    4851.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.14  DOWNSTREAM(FEET) =   120.57
  FLOW LENGTH(FEET) =  1855.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.78
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     151.15
  PIPE TRAVEL TIME(MIN.) =   1.84    Tc(MIN.) =   29.91
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13880.00 =    6706.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   29.91
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.244
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.90      0.30     0.743     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.743
  SUBAREA AREA(ACRES) =   34.90      SUBAREA RUNOFF(CFS) =   32.09
```

```
  EFFECTIVE AREA(ACRES) =    200.33   AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.90
  TOTAL AREA(ACRES) =      200.3       PEAK FLOW RATE(CFS) =     175.72

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.91
  RAINFALL INTENSITY(INCH/HR) =   1.24
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.90
  EFFECTIVE STREAM AREA(ACRES) =     200.33
  TOTAL STREAM AREA(ACRES) =     200.33
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     175.72

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16949.47   25.46    1.366  0.30( 0.29) 0.96    4597.6   13810.00
      1    17181.46   26.88    1.328  0.30( 0.29) 0.96    4877.3   13850.00
      1    17823.00   30.89    1.226  0.30( 0.29) 0.96    5654.2   10300.00
      1    18986.51   37.31    1.108  0.30( 0.29) 0.96    7321.9   10400.00
      1    19359.97   39.11    1.075  0.30( 0.29) 0.96    7910.4   13830.00
      1    20634.40   45.55    0.993  0.30( 0.29) 0.97    9909.7   20700.00
      1    21860.87   54.08    0.905  0.30( 0.29) 0.97   12795.0   10100.00
      1    23278.23   63.02    0.837  0.30( 0.29) 0.97   16698.7   20300.00
      1    24902.86   76.38    0.771  0.30( 0.29) 0.97   22835.7   31400.00
      1    25907.15   89.35    0.707  0.30( 0.29) 0.96   28756.5   13100.00
      1    26149.48   96.34    0.686  0.30( 0.29) 0.96   31421.0   11801.00
      1    27283.31  113.63    0.637  0.30( 0.29) 0.97   39683.8   13510.00
      1    28616.92  126.95    0.607  0.30( 0.29) 0.97   47617.5   11330.00
      1    29148.70  134.97    0.594  0.30( 0.29) 0.97   52702.1   10630.00
      1    28856.79  140.63    0.584  0.30( 0.29) 0.97   55295.9   12330.00
      1    28560.84  147.29    0.573  0.30( 0.29) 0.97   58434.6   11600.00
      1    28151.39  153.15    0.563  0.30( 0.29) 0.97   60667.0   11111.00
      1    27696.84  159.40    0.552  0.30( 0.29) 0.97   62603.2   12201.00
      1    26728.08  168.57    0.536  0.30( 0.29) 0.97   64690.9   12231.00
      1    25845.42  176.30    0.523  0.30( 0.29) 0.97   66104.2   10400.00
      1    24447.06  188.09    0.511  0.30( 0.29) 0.98   67721.4   10320.00
      1    23140.28  198.23    0.503  0.30( 0.29) 0.98   68110.8   12000.00
      1    20113.62  228.56    0.479  0.30( 0.29) 0.98   68728.6   10100.00
      2      175.72   29.91    1.244  0.30( 0.27) 0.90     200.3   13870.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    17117.77   25.46    1.366  0.30( 0.29) 0.96    4768.1   13810.00
      2    17352.83   26.88    1.328  0.30( 0.29) 0.96    5057.3   13850.00
      3    17842.54   29.91    1.244  0.30( 0.29) 0.96    5665.4   13870.00
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      4    17995.35   30.89    1.226  0.30( 0.29) 0.96    5854.6   10300.00
      5    19137.69   37.31    1.108  0.30( 0.29) 0.96    7522.2   10400.00
      6    19505.19   39.11    1.075  0.30( 0.29) 0.96    8110.7   13830.00
      7    20764.88   45.55    0.993  0.30( 0.29) 0.97   10110.1   20700.00
      8    21975.33   54.08    0.905  0.30( 0.29) 0.97   12995.3   10100.00
      9    23380.52   63.02    0.837  0.30( 0.29) 0.97   16899.0   20300.00
     10    24993.25   76.38    0.771  0.30( 0.29) 0.96   23036.1   31400.00
     11    25986.01   89.35    0.707  0.30( 0.29) 0.96   28956.8   13100.00
     12    26224.52   96.34    0.686  0.30( 0.29) 0.96   31621.4   11801.00
     13    27349.53  113.63    0.637  0.30( 0.29) 0.97   39884.1   13510.00
     14    28677.74  126.95    0.607  0.30( 0.29) 0.97   47817.8   11330.00
     15    29207.06  134.97    0.594  0.30( 0.29) 0.97   52902.4   10630.00
     16    28913.43  140.63    0.584  0.30( 0.29) 0.97   55496.2   12330.00
     17    28615.43  147.29    0.573  0.30( 0.29) 0.97   58634.9   11600.00
     18    28204.19  153.15    0.563  0.30( 0.29) 0.97   60867.3   11111.00
     19    27747.73  159.40    0.552  0.30( 0.29) 0.97   62803.5   12201.00
     20    26776.15  168.57    0.536  0.30( 0.29) 0.97   64891.2   12231.00
     21    25891.12  176.30    0.523  0.30( 0.29) 0.97   66304.6   10400.00
     22    24490.50  188.09    0.511  0.30( 0.29) 0.98   67921.8   10320.00
     23    23182.31  198.23    0.503  0.30( 0.29) 0.98   68311.1   12000.00
     24    20151.42  228.56    0.479  0.30( 0.29) 0.98   68928.9   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   29207.06    Tc(MIN.) =   134.97
  EFFECTIVE AREA(ACRES) =   52902.42   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68928.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13880.00 =  134069.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    120.57  DOWNSTREAM(FEET) =    119.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1190.21   CHANNEL SLOPE =  0.0007
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  20.64
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.589
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.69      0.30      0.724     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.724
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29226.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.76
  AVERAGE FLOW DEPTH(FEET) =  20.63   TRAVEL TIME(MIN.) =   2.56
  Tc(MIN.) =  137.53
  SUBAREA AREA(ACRES) =   117.69       SUBAREA RUNOFF(CFS) =   39.41
  EFFECTIVE AREA(ACRES) =  53020.11     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69046.6         PEAK FLOW RATE(CFS) =   29207.06
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =  20.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 20.63   FLOW VELOCITY(FEET/SEC.) =   7.76
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13910.00 =  135259.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  137.53
  RAINFALL INTENSITY(INCH/HR) =   0.59
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   53020.11
  TOTAL STREAM AREA(ACRES) =   69046.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   29207.06

****************************************************************************
  FLOW PROCESS FROM NODE  13889.00 TO NODE  13890.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   447.89
  ELEVATION DATA: UPSTREAM(FEET) =    564.89  DOWNSTREAM(FEET) =    421.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.976
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.215
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK               -        3.03      0.30     0.960     0    6.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.960
  SUBAREA RUNOFF(CFS) =      7.98
  TOTAL AREA(ACRES) =      3.03   PEAK FLOW RATE(CFS) =      7.98

****************************************************************************
  FLOW PROCESS FROM NODE  13890.00 TO NODE  13891.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    421.92  DOWNSTREAM(FEET) =    392.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   435.33   CHANNEL SLOPE =  0.0673
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.825
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED              -        8.12      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.56
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   1.59
  Tc(MIN.) =    8.57
  SUBAREA AREA(ACRES) =     8.12       SUBAREA RUNOFF(CFS) =   18.49
  EFFECTIVE AREA(ACRES) =     11.15     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       11.1          PEAK FLOW RATE(CFS) =      25.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   5.24
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13891.00 =     883.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13891.00 TO NODE  13892.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    392.64  DOWNSTREAM(FEET) =    324.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =   662.40   CHANNEL SLOPE =  0.1029
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.51
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.455
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       12.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.93
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   1.59
  Tc(MIN.) =   10.16
  SUBAREA AREA(ACRES) =    12.50       SUBAREA RUNOFF(CFS) =   24.24
  EFFECTIVE AREA(ACRES) =     23.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       23.6          PEAK FLOW RATE(CFS) =      45.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   7.46
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13892.00 =    1545.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13892.00 TO NODE  13893.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    324.46  DOWNSTREAM(FEET) =    240.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   980.03   CHANNEL SLOPE =  0.0853
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.187
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.67
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =   12.29
  SUBAREA AREA(ACRES) =    15.87       SUBAREA RUNOFF(CFS) =   26.95
  EFFECTIVE AREA(ACRES) =     39.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       39.5         PEAK FLOW RATE(CFS) =      67.18
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   7.97
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13893.00 =    2525.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13893.00 TO NODE  13894.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.82  DOWNSTREAM(FEET) =    163.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1144.35   CHANNEL SLOPE =  0.0680
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.94
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.891
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.41      0.30     0.985     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.985
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      87.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.12
  AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =   2.35
  Tc(MIN.) =   14.64
  SUBAREA AREA(ACRES) =    28.41       SUBAREA RUNOFF(CFS) =   40.81
  EFFECTIVE AREA(ACRES) =     67.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =      97.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   8.40
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13894.00 =    3670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   163.04  DOWNSTREAM(FEET) =   119.70
  FLOW LENGTH(FEET) =  1899.01   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.93
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      97.48
  PIPE TRAVEL TIME(MIN.) =   1.99    Tc(MIN.) =   16.63
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13910.00 =    5569.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   16.63
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.759
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.69      0.30     0.634     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.634
  SUBAREA AREA(ACRES) =   11.69      SUBAREA RUNOFF(CFS) =   16.50
  EFFECTIVE AREA(ACRES) =     79.62   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.94
  TOTAL AREA(ACRES) =       79.6       PEAK FLOW RATE(CFS) =     105.88

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.63
  RAINFALL INTENSITY(INCH/HR) =   1.76
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.94
  EFFECTIVE STREAM AREA(ACRES) =      79.62
  TOTAL STREAM AREA(ACRES) =      79.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     105.88

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	17117.77	28.43	1.285	0.30(0.29)	0.95	4885.8	13810.00
1	17352.83	29.83	1.247	0.30(0.29)	0.95	5175.0	13850.00
1	17842.54	32.84	1.190	0.30(0.29)	0.95	5783.1	13870.00
1	17995.35	33.81	1.172	0.30(0.29)	0.95	5972.3	10300.00
1	19137.69	40.18	1.057	0.30(0.29)	0.96	7639.9	10400.00
1	19505.19	41.97	1.036	0.30(0.29)	0.96	8228.4	13830.00
1	20764.88	48.36	0.960	0.30(0.29)	0.96	10227.8	20700.00
1	21975.33	56.85	0.880	0.30(0.29)	0.97	13113.0	10100.00
1	23380.52	65.74	0.824	0.30(0.29)	0.97	17016.7	20300.00
1	24993.25	79.05	0.758	0.30(0.29)	0.96	23153.8	31400.00
1	25986.01	91.99	0.698	0.30(0.29)	0.96	29074.5	13100.00
1	26224.52	98.98	0.679	0.30(0.29)	0.96	31739.0	11801.00
1	27349.53	116.24	0.630	0.30(0.29)	0.96	40001.8	13510.00
1	28677.74	129.52	0.603	0.30(0.29)	0.97	47935.5	11330.00
1	29207.06	137.53	0.589	0.30(0.29)	0.97	53020.1	10630.00
1	28913.43	143.19	0.580	0.30(0.29)	0.97	55613.9	12330.00
1	28615.43	149.86	0.568	0.30(0.29)	0.97	58752.6	11600.00
1	28204.19	155.73	0.558	0.30(0.29)	0.97	60985.0	11111.00
1	27747.73	161.99	0.548	0.30(0.29)	0.97	62921.2	12201.00
1	26776.15	171.19	0.532	0.30(0.29)	0.97	65008.9	12231.00
1	25891.12	178.94	0.519	0.30(0.29)	0.97	66422.3	10400.00
1	24490.50	190.77	0.509	0.30(0.29)	0.97	68039.5	10320.00
1	23182.31	200.96	0.501	0.30(0.29)	0.97	68428.8	12000.00
1	20151.42	231.39	0.477	0.30(0.29)	0.98	69046.6	10100.00
2	105.88	16.63	1.759	0.30(0.28)	0.94	79.6	13889.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14860.24	16.63	1.759	0.30(0.29)	0.95	2936.8	13889.00
2	17189.69	28.43	1.285	0.30(0.29)	0.95	4965.4	13810.00
3	17422.00	29.83	1.247	0.30(0.29)	0.95	5254.6	13850.00
4	17907.66	32.84	1.190	0.30(0.29)	0.95	5862.7	13870.00
5	18059.20	33.81	1.172	0.30(0.29)	0.95	6051.9	10300.00
6	19193.26	40.18	1.057	0.30(0.29)	0.96	7719.5	10400.00
7	19559.24	41.97	1.036	0.30(0.29)	0.96	8308.0	13830.00
8	20813.53	48.36	0.960	0.30(0.29)	0.96	10307.4	20700.00
9	22018.24	56.85	0.880	0.30(0.29)	0.97	13192.6	10100.00
10	23419.38	65.74	0.824	0.30(0.29)	0.97	17096.3	20300.00
11	25027.41	79.05	0.758	0.30(0.29)	0.96	23233.4	31400.00
12	26015.89	91.99	0.698	0.30(0.29)	0.96	29154.1	13100.00
13	26252.98	98.98	0.679	0.30(0.29)	0.96	31818.7	11801.00
14	27374.49	116.24	0.630	0.30(0.29)	0.96	40081.4	13510.00
15	28700.78	129.52	0.603	0.30(0.29)	0.97	48015.2	11330.00
16	29229.13	137.53	0.589	0.30(0.29)	0.97	53099.7	10630.00
17	28934.80	143.19	0.580	0.30(0.29)	0.97	55693.6	12330.00
18	28635.99	149.86	0.568	0.30(0.29)	0.97	58832.2	11600.00
19	28224.03	155.73	0.558	0.30(0.29)	0.97	61064.6	11111.00
20	27766.81	161.99	0.548	0.30(0.29)	0.97	63000.8	12201.00
21	26794.12	171.19	0.532	0.30(0.29)	0.97	65088.6	12231.00
22	25908.14	178.94	0.519	0.30(0.29)	0.97	66501.9	10400.00
23	24506.80	190.77	0.509	0.30(0.29)	0.97	68119.1	10320.00
24	23198.04	200.96	0.501	0.30(0.29)	0.97	68508.4	12000.00
25	20165.47	231.39	0.477	0.30(0.29)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 29229.13 Tc(MIN.) = 137.53
EFFECTIVE AREA(ACRES) = 53099.73 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 69126.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 69126.2 TC(MIN.) = 137.53
EFFECTIVE AREA(ACRES) = 53099.73 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.971
PEAK FLOW RATE(CFS) = 29229.13

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14860.24	16.63	1.759	0.30(0.29)	0.95	2936.8	13889.00
2	17189.69	28.43	1.285	0.30(0.29)	0.95	4965.4	13810.00
3	17422.00	29.83	1.247	0.30(0.29)	0.95	5254.6	13850.00
4	17907.66	32.84	1.190	0.30(0.29)	0.95	5862.7	13870.00
5	18059.20	33.81	1.172	0.30(0.29)	0.95	6051.9	10300.00
6	19193.26	40.18	1.057	0.30(0.29)	0.96	7719.5	10400.00
7	19559.24	41.97	1.036	0.30(0.29)	0.96	8308.0	13830.00
8	20813.53	48.36	0.960	0.30(0.29)	0.96	10307.4	20700.00
9	22018.24	56.85	0.880	0.30(0.29)	0.97	13192.6	10100.00
10	23419.38	65.74	0.824	0.30(0.29)	0.97	17096.3	20300.00
11	25027.41	79.05	0.758	0.30(0.29)	0.96	23233.4	31400.00
12	26015.89	91.99	0.698	0.30(0.29)	0.96	29154.1	13100.00
13	26252.98	98.98	0.679	0.30(0.29)	0.96	31818.7	11801.00
14	27374.49	116.24	0.630	0.30(0.29)	0.96	40081.4	13510.00
15	28700.78	129.52	0.603	0.30(0.29)	0.97	48015.2	11330.00
16	29229.13	137.53	0.589	0.30(0.29)	0.97	53099.7	10630.00
17	28934.80	143.19	0.580	0.30(0.29)	0.97	55693.6	12330.00
18	28635.99	149.86	0.568	0.30(0.29)	0.97	58832.2	11600.00
19	28224.03	155.73	0.558	0.30(0.29)	0.97	61064.6	11111.00
20	27766.81	161.99	0.548	0.30(0.29)	0.97	63000.8	12201.00
21	26794.12	171.19	0.532	0.30(0.29)	0.97	65088.6	12231.00
22	25908.14	178.94	0.519	0.30(0.29)	0.97	66501.9	10400.00
23	24506.80	190.77	0.509	0.30(0.29)	0.97	68119.1	10320.00
24	23198.04	200.96	0.501	0.30(0.29)	0.97	68508.4	12000.00
25	20165.47	231.39	0.477	0.30(0.29)	0.98	69126.2	10100.00

==========

==========

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S39.DAT
  TIME/DATE OF STUDY: 09:06 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  3.694
   2)   10.00;  2.473
   3)   15.00;  1.845
   4)   20.00;  1.577
   5)   25.00;  1.378
   6)   30.00;  1.242
   7)   40.00;  1.058
   8)   50.00;  0.941
   9)   60.00;  0.852
  10)   90.00;  0.704
  11)  120.00;  0.618
  12)  180.00;  0.516
  13)  360.00;  0.377
  14) 1200.00;  0.164
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13900.00 TO NODE  13901.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   600.65
  ELEVATION DATA: UPSTREAM(FEET) =    442.40  DOWNSTREAM(FEET) =    385.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.859
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.365
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  AGRICULTURAL POOR COVER
  "FALLOW"                  -        4.00      0.30     1.000      0   10.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.43
  TOTAL AREA(ACRES) =      4.00   PEAK FLOW RATE(CFS) =      7.43

**************************************************************************
  FLOW PROCESS FROM NODE  13901.00 TO NODE  13902.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    385.16  DOWNSTREAM(FEET) =    288.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   647.42   CHANNEL SLOPE =  0.1497
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.119
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        8.47      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.51
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   1.96
  Tc(MIN.) =   12.82
  SUBAREA AREA(ACRES) =     8.47       SUBAREA RUNOFF(CFS) =   13.87
  EFFECTIVE AREA(ACRES) =     12.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.5          PEAK FLOW RATE(CFS) =      20.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =   6.24
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13902.00 =    1248.07 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13902.00 TO NODE  13903.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.21  DOWNSTREAM(FEET) =    184.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   669.27   CHANNEL SLOPE =  0.1544
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.943
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.85      0.30     0.982     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.982
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.97
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   1.40
  Tc(MIN.) =   14.22
  SUBAREA AREA(ACRES) =    23.85       SUBAREA RUNOFF(CFS) =   35.39
  EFFECTIVE AREA(ACRES) =     36.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       36.3         PEAK FLOW RATE(CFS) =      53.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   9.02
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13903.00 =    1917.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   184.89  DOWNSTREAM(FEET) =   155.08
  FLOW LENGTH(FEET) =   876.66   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.18
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      53.84
  PIPE TRAVEL TIME(MIN.) =   0.90    Tc(MIN.) =   15.12
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13904.00 =    2794.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.12
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.839
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       21.29      0.30     0.996     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.996
  SUBAREA AREA(ACRES) =   21.29      SUBAREA RUNOFF(CFS) =   29.51
  EFFECTIVE AREA(ACRES) =     57.61   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =       57.6       PEAK FLOW RATE(CFS) =      79.92

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.08  DOWNSTREAM(FEET) =   118.00
  FLOW LENGTH(FEET) =  1961.38   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.96
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      79.92
  PIPE TRAVEL TIME(MIN.) =   2.34    Tc(MIN.) =   17.46
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.46
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.713
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.53      0.30     0.649     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.649
  SUBAREA AREA(ACRES) =   43.53      SUBAREA RUNOFF(CFS) =   59.49
  EFFECTIVE AREA(ACRES) =    101.14   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =      101.1       PEAK FLOW RATE(CFS) =     132.90

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S38.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    14860.24   16.63  0.30( 0.29) 0.95    2936.8   13889.00
      2    18059.20   33.81  0.30( 0.29) 0.95    6051.9   10300.00
```

```
      3    19559.24   41.97  0.30( 0.29) 0.96    8308.0   13830.00
      4    20813.53   48.36  0.30( 0.29) 0.96   10307.4   20700.00
      5    22018.24   56.85  0.30( 0.29) 0.97   13192.6   10100.00
      6    23419.38   65.74  0.30( 0.29) 0.97   17096.3   20300.00
      7    25027.41   79.05  0.30( 0.29) 0.96   23233.4   31400.00
      8    26015.89   91.99  0.30( 0.29) 0.96   29154.1   13100.00
      9    26252.98   98.98  0.30( 0.29) 0.96   31818.7   11801.00
     10    27374.49  116.24  0.30( 0.29) 0.96   40081.4   13510.00
     11    28700.78  129.52  0.30( 0.29) 0.97   48015.2   11330.00
     12    29229.13  137.53  0.30( 0.29) 0.97   53099.7   10630.00
     13    28635.99  149.86  0.30( 0.29) 0.97   58832.2   11600.00
     14    28224.03  155.73  0.30( 0.29) 0.97   61064.6   11111.00
     15    27766.81  161.99  0.30( 0.29) 0.97   63000.8   12201.00
     16    26794.12  171.19  0.30( 0.29) 0.97   65088.6   12231.00
     17    25908.14  178.94  0.30( 0.29) 0.97   66501.9   10400.00
     18    24506.80  190.77  0.30( 0.29) 0.97   68119.1   10320.00
     19    23198.04  200.96  0.30( 0.29) 0.97   68508.4   12000.00
     20    20165.47  231.39  0.30( 0.29) 0.98   69126.2   10100.00
   TOTAL AREA(ACRES) =    69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    14860.24   16.63  0.30( 0.29) 0.95    2936.8   13889.00
      2    18059.20   33.81  0.30( 0.29) 0.95    6051.9   10300.00
      3    19559.24   41.97  0.30( 0.29) 0.96    8308.0   13830.00
      4    20813.53   48.36  0.30( 0.29) 0.96   10307.4   20700.00
      5    22018.24   56.85  0.30( 0.29) 0.97   13192.6   10100.00
      6    23419.38   65.74  0.30( 0.29) 0.97   17096.3   20300.00
      7    25027.41   79.05  0.30( 0.29) 0.96   23233.4   31400.00
      8    26015.89   91.99  0.30( 0.29) 0.96   29154.1   13100.00
      9    26252.98   98.98  0.30( 0.29) 0.96   31818.7   11801.00
     10    27374.49  116.24  0.30( 0.29) 0.96   40081.4   13510.00
     11    28700.78  129.52  0.30( 0.29) 0.97   48015.2   11330.00
     12    29229.13  137.53  0.30( 0.29) 0.97   53099.7   10630.00
     13    28635.99  149.86  0.30( 0.29) 0.97   58832.2   11600.00
     14    28224.03  155.73  0.30( 0.29) 0.97   61064.6   11111.00
     15    27766.81  161.99  0.30( 0.29) 0.97   63000.8   12201.00
     16    26794.12  171.19  0.30( 0.29) 0.97   65088.6   12231.00
     17    25908.14  178.94  0.30( 0.29) 0.97   66501.9   10400.00
     18    24506.80  190.77  0.30( 0.29) 0.97   68119.1   10320.00
     19    23198.04  200.96  0.30( 0.29) 0.97   68508.4   12000.00
     20    20165.47  231.39  0.30( 0.29) 0.98   69126.2   10100.00
   TOTAL AREA(ACRES) =     69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    119.70  DOWNSTREAM(FEET) =    118.00
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1376.26   CHANNEL SLOPE =  0.0012
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  18.09
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.584
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.09      0.30     0.535     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.535
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29247.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.38
  AVERAGE FLOW DEPTH(FEET) =  18.09   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =  139.97
  SUBAREA AREA(ACRES) =    96.09       SUBAREA RUNOFF(CFS) =   36.63
  EFFECTIVE AREA(ACRES) =  53195.82     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69222.3         PEAK FLOW RATE(CFS) =   29229.13
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  18.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 18.08   FLOW VELOCITY(FEET/SEC.) =   9.38
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14860.24   19.59    1.599  0.30( 0.28) 0.94    3032.9   13889.00
      2    18059.20   36.61    1.120  0.30( 0.28) 0.95    6148.0   10300.00
      3    19559.24   44.71    1.003  0.30( 0.29) 0.95    8404.1   13830.00
      4    20813.53   51.05    0.932  0.30( 0.29) 0.96   10403.5   20700.00
      5    22018.24   59.49    0.857  0.30( 0.29) 0.96   13288.7   10100.00
      6    23419.38   68.34    0.811  0.30( 0.29) 0.96   17192.4   20300.00
      7    25027.41   81.60    0.745  0.30( 0.29) 0.96   23329.5   31400.00
      8    26015.89   94.51    0.691  0.30( 0.29) 0.96   29250.2   13100.00
      9    26252.98  101.50    0.671  0.30( 0.29) 0.96   31914.8   11801.00
     10    27374.49  118.73    0.622  0.30( 0.29) 0.96   40177.5   13510.00
     11    28700.78  131.98    0.598  0.30( 0.29) 0.97   48111.2   11330.00
     12    29229.13  139.97    0.584  0.30( 0.29) 0.97   53195.8   10630.00
     13    28635.99  152.32    0.563  0.30( 0.29) 0.97   58928.3   11600.00
     14    28224.03  158.20    0.553  0.30( 0.29) 0.97   61160.7   11111.00
     15    27766.81  164.47    0.542  0.30( 0.29) 0.97   63096.9   12201.00
     16    26794.12  173.69    0.527  0.30( 0.29) 0.97   65184.6   12231.00
     17    25908.14  181.47    0.515  0.30( 0.29) 0.97   66598.0   10400.00
     18    24506.80  193.34    0.506  0.30( 0.29) 0.97   68215.2   10320.00
     19    23198.04  203.57    0.498  0.30( 0.29) 0.97   68604.5   12000.00
     20    20165.47  234.11    0.474  0.30( 0.29) 0.97   69222.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.
```

```
 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      132.90   17.46    1.713  0.30( 0.25) 0.84     101.1   13900.00
 LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    14525.65   17.46    1.713  0.30( 0.28) 0.93    2805.0   13900.00
     2    14982.77   19.59    1.599  0.30( 0.28) 0.93    3134.0   13889.00
     3    18138.14   36.61    1.120  0.30( 0.28) 0.95    6249.1   10300.00
     4    19627.50   44.71    1.003  0.30( 0.29) 0.95    8505.2   13830.00
     5    20875.30   51.05    0.932  0.30( 0.29) 0.96   10504.6   20700.00
     6    22073.16   59.49    0.857  0.30( 0.29) 0.96   13389.8   10100.00
     7    23470.15   68.34    0.811  0.30( 0.29) 0.96   17293.6   20300.00
     8    25072.22   81.60    0.745  0.30( 0.29) 0.96   23430.6   31400.00
     9    26055.76   94.51    0.691  0.30( 0.29) 0.96   29351.3   13100.00
    10    26291.03  101.50    0.671  0.30( 0.29) 0.96   32015.9   11801.00
    11    27408.04  118.73    0.622  0.30( 0.29) 0.96   40278.6   13510.00
    12    28732.14  131.98    0.598  0.30( 0.29) 0.97   48212.4   11330.00
    13    29259.25  139.97    0.584  0.30( 0.29) 0.97   53297.0   10630.00
    14    28664.21  152.32    0.563  0.30( 0.29) 0.97   59029.4   11600.00
    15    28251.33  158.20    0.553  0.30( 0.29) 0.97   61261.8   11111.00
    16    27793.14  164.47    0.542  0.30( 0.29) 0.97   63198.1   12201.00
    17    26819.03  173.69    0.527  0.30( 0.29) 0.97   65285.8   12231.00
    18    25931.97  181.47    0.515  0.30( 0.29) 0.97   66699.1   10400.00
    19    24529.79  193.34    0.506  0.30( 0.29) 0.97   68316.3   10320.00
    20    23220.31  203.57    0.498  0.30( 0.29) 0.97   68705.7   12000.00
    21    20185.59  234.11    0.474  0.30( 0.29) 0.97   69323.4   10100.00
   TOTAL AREA(ACRES) =     69323.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    29259.25  Tc(MIN.) =  139.974
 EFFECTIVE AREA(ACRES) =  53296.96  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    69323.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13920.00 TO NODE  13921.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    118.00  DOWNSTREAM(FEET) =    115.28
 CHANNEL LENGTH THRU SUBAREA(FEET) =   335.44   CHANNEL SLOPE =  0.0081
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.07
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.584
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      134.30      0.30     0.658     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.658
```



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 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29282.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.36
 AVERAGE FLOW DEPTH(FEET) =  11.06   TRAVEL TIME(MIN.) =   0.30
 Tc(MIN.) =  140.28
 SUBAREA AREA(ACRES) =   134.30       SUBAREA RUNOFF(CFS) =   46.68
 EFFECTIVE AREA(ACRES) =  53431.26     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =    69457.7         PEAK FLOW RATE(CFS) =   29259.25
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.06

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 11.06   FLOW VELOCITY(FEET/SEC.) =  18.35
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13921.00 =  136971.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13921.00 TO NODE  14010.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    115.28  DOWNSTREAM(FEET) =    100.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1396.08   CHANNEL SLOPE =  0.0109
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.20
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.582
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       96.27      0.30     0.723     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.723
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29275.05
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.39
 AVERAGE FLOW DEPTH(FEET) =  10.20   TRAVEL TIME(MIN.) =   1.14
 Tc(MIN.) =  141.42
 SUBAREA AREA(ACRES) =    96.27       SUBAREA RUNOFF(CFS) =   31.60
 EFFECTIVE AREA(ACRES) =  53527.53     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =    69554.0         PEAK FLOW RATE(CFS) =   29259.25
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.20

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.20   FLOW VELOCITY(FEET/SEC.) =  20.38
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  14010.00 =  138367.47 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    69554.0  TC(MIN.) =    141.42
 EFFECTIVE AREA(ACRES) =  53527.53  AREA-AVERAGED Fm(INCH/HR)=  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.969
 PEAK FLOW RATE(CFS)   =   29259.25
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14525.65	19.25	1.617	0.30(0.27)	0.91	3035.5	13900.00
2	14982.77	21.36	1.523	0.30(0.28)	0.92	3364.6	13889.00
3	18138.14	38.28	1.090	0.30(0.28)	0.94	6479.7	10300.00
4	19627.50	46.34	0.984	0.30(0.28)	0.95	8735.8	13830.00
5	20875.30	52.65	0.917	0.30(0.29)	0.95	10735.2	20700.00
6	22073.16	61.07	0.847	0.30(0.29)	0.96	13620.4	10100.00
7	23470.15	69.88	0.803	0.30(0.29)	0.96	17524.1	20300.00
8	25072.22	83.12	0.738	0.30(0.29)	0.96	23661.2	31400.00
9	26055.76	96.01	0.687	0.30(0.29)	0.96	29581.9	13100.00
10	26291.03	102.99	0.667	0.30(0.29)	0.96	32246.5	11801.00
11	27408.04	120.20	0.618	0.30(0.29)	0.96	40509.2	13510.00
12	28732.14	133.43	0.595	0.30(0.29)	0.97	48443.0	11330.00
13	29259.25	141.42	0.582	0.30(0.29)	0.97	53527.5	10630.00
14	28664.21	153.78	0.561	0.30(0.29)	0.97	59260.0	11600.00
15	28251.33	159.66	0.551	0.30(0.29)	0.97	61492.4	11111.00
16	27793.14	165.94	0.540	0.30(0.29)	0.97	63428.6	12201.00
17	26819.03	175.17	0.524	0.30(0.29)	0.97	65516.4	12231.00
18	25931.97	182.97	0.514	0.30(0.29)	0.97	66929.7	10400.00
19	24529.79	194.87	0.505	0.30(0.29)	0.97	68546.9	10320.00
20	23220.31	205.12	0.497	0.30(0.29)	0.97	68936.2	12000.00
21	20185.59	235.73	0.473	0.30(0.29)	0.97	69554.0	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S1.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.917
   2)   10.00;  3.773
   3)   15.00;  2.782
   4)   20.00;  2.242
   5)   25.00;  1.936
   6)   30.00;  1.670
   7)   40.00;  1.479
   8)   50.00;  1.319
   9)   60.00;  1.208
  10)   90.00;  1.048
  11)  120.00;  0.947
  12)  180.00;  0.814
  13)  360.00;  0.633
  14) 1440.00;  0.288
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10100.00 TO NODE  10101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   934.06
  ELEVATION DATA: UPSTREAM(FEET) =   3351.52  DOWNSTREAM(FEET) =   3172.56

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.766
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        3.55      0.30     1.000     0   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.88
  TOTAL AREA(ACRES) =      3.55   PEAK FLOW RATE(CFS) =      7.88

**************************************************************************
  FLOW PROCESS FROM NODE  10101.00 TO NODE  10102.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3172.56  DOWNSTREAM(FEET) =   3090.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   942.40   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.57
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.384
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       19.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.45
  AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =   3.53
  Tc(MIN.) =   18.68
  SUBAREA AREA(ACRES) =    19.22       SUBAREA RUNOFF(CFS) =   36.05
  EFFECTIVE AREA(ACRES) =     22.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.8          PEAK FLOW RATE(CFS) =      42.71
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   5.30
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10102.00 =    1876.46 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10102.00 TO NODE  10103.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3090.55  DOWNSTREAM(FEET) =   3022.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   920.65   CHANNEL SLOPE =  0.0740
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.156
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.64
  AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =   2.72
  Tc(MIN.) =   21.41
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   35.95
  EFFECTIVE AREA(ACRES) =     44.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       44.3         PEAK FLOW RATE(CFS) =      73.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.02   FLOW VELOCITY(FEET/SEC.) =   6.03
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10103.00 =    2797.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10103.00 TO NODE  10104.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3022.44  DOWNSTREAM(FEET) =   2962.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.87   CHANNEL SLOPE =  0.0612
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.020
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      126.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     172.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.36
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   2.21
  Tc(MIN.) =   23.62
  SUBAREA AREA(ACRES) =   126.78       SUBAREA RUNOFF(CFS) =  196.32
  EFFECTIVE AREA(ACRES) =    171.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.1         PEAK FLOW RATE(CFS) =     264.90
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.20   FLOW VELOCITY(FEET/SEC.) =   8.36
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10104.00 =    3774.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10104.00 TO NODE  10105.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.57  DOWNSTREAM(FEET) =   2917.85
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.94   CHANNEL SLOPE =  0.0240
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.28
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.752
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.68      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     338.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.41
  AVERAGE FLOW DEPTH(FEET) =   3.21   TRAVEL TIME(MIN.) =   4.85
  Tc(MIN.) =   28.47
  SUBAREA AREA(ACRES) =   112.68       SUBAREA RUNOFF(CFS) =  147.21
  EFFECTIVE AREA(ACRES) =    283.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      283.8         PEAK FLOW RATE(CFS) =     370.70
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.37   FLOW VELOCITY(FEET/SEC.) =   6.58
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.00 =    5639.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.00 TO NODE  10105.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2917.85  DOWNSTREAM(FEET) =   2880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1406.97   CHANNEL SLOPE =  0.0269
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.77
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.639
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      183.39      0.30     1.000     -
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     481.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.37
  AVERAGE FLOW DEPTH(FEET) =   3.74   TRAVEL TIME(MIN.) =   3.18
  Tc(MIN.) =   31.65
  SUBAREA AREA(ACRES) =   183.39       SUBAREA RUNOFF(CFS) =  220.94
  EFFECTIVE AREA(ACRES) =    467.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      467.1          PEAK FLOW RATE(CFS) =     562.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.05   FLOW VELOCITY(FEET/SEC.) =   7.69
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.50 =    7046.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.50 TO NODE  10106.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2880.00  DOWNSTREAM(FEET) =   2868.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1701.11   CHANNEL SLOPE =  0.0070
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.81
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.525
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     596.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.76
  AVERAGE FLOW DEPTH(FEET) =   5.80   TRAVEL TIME(MIN.) =   5.95
  Tc(MIN.) =   37.60
  SUBAREA AREA(ACRES) =    60.63       SUBAREA RUNOFF(CFS) =   66.84
  EFFECTIVE AREA(ACRES) =    527.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      527.8          PEAK FLOW RATE(CFS) =     581.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.73   FLOW VELOCITY(FEET/SEC.) =   4.73
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10106.00 =    8748.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10106.00 TO NODE  10107.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   2868.10  DOWNSTREAM(FEET) =   2781.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2951.00   CHANNEL SLOPE =  0.0294
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.422
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     644.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   4.23   TRAVEL TIME(MIN.) =   5.97
  Tc(MIN.) =   43.56
  SUBAREA AREA(ACRES) =   123.11       SUBAREA RUNOFF(CFS) =  124.32
  EFFECTIVE AREA(ACRES) =    650.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.9          PEAK FLOW RATE(CFS) =     657.28
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.28   FLOW VELOCITY(FEET/SEC.) =   8.29
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10107.00 =   11699.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10107.00 TO NODE  10108.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2781.28  DOWNSTREAM(FEET) =   2725.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2630.56   CHANNEL SLOPE =  0.0213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.95
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.330
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      186.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     743.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.61
  AVERAGE FLOW DEPTH(FEET) =   4.92   TRAVEL TIME(MIN.) =   5.76
  Tc(MIN.) =   49.33
  SUBAREA AREA(ACRES) =   186.62       SUBAREA RUNOFF(CFS) =  172.97
  EFFECTIVE AREA(ACRES) =    837.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      837.5          PEAK FLOW RATE(CFS) =     776.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.03
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.03   FLOW VELOCITY(FEET/SEC.) =   7.69
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10108.00 =   14329.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10108.00 TO NODE  10109.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2725.20  DOWNSTREAM(FEET) =   2581.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2890.52   CHANNEL SLOPE =  0.0496
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.21
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.276
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     825.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.66
  AVERAGE FLOW DEPTH(FEET) =   4.21   TRAVEL TIME(MIN.) =   4.52
  Tc(MIN.) =   53.85
  SUBAREA AREA(ACRES) =   112.07       SUBAREA RUNOFF(CFS) =   98.48
  EFFECTIVE AREA(ACRES) =    949.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      949.6         PEAK FLOW RATE(CFS) =     834.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.23   FLOW VELOCITY(FEET/SEC.) =  10.69
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10109.00 =   17220.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10109.00 TO NODE  10110.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.72  DOWNSTREAM(FEET) =   2367.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2877.15   CHANNEL SLOPE =  0.0744
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.96
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.234
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     895.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.64
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  AVERAGE FLOW DEPTH(FEET) =   3.95   TRAVEL TIME(MIN.) =   3.79
  Tc(MIN.) =   57.64
  SUBAREA AREA(ACRES) =   145.21       SUBAREA RUNOFF(CFS) =  122.10
  EFFECTIVE AREA(ACRES) =   1094.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1094.8         PEAK FLOW RATE(CFS) =     920.55
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.01   FLOW VELOCITY(FEET/SEC.) =  12.74
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10110.00 =   20097.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10110.00 TO NODE  10111.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2367.59  DOWNSTREAM(FEET) =   2075.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2802.04   CHANNEL SLOPE =  0.1041
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.96
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.204
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1058.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.94
  AVERAGE FLOW DEPTH(FEET) =   3.95   TRAVEL TIME(MIN.) =   3.13
  Tc(MIN.) =   60.76
  SUBAREA AREA(ACRES) =   339.01       SUBAREA RUNOFF(CFS) =  275.82
  EFFECTIVE AREA(ACRES) =   1433.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1433.8         PEAK FLOW RATE(CFS) =    1166.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.15   FLOW VELOCITY(FEET/SEC.) =  15.34
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10111.00 =   22899.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10111.00 TO NODE  10112.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2075.82  DOWNSTREAM(FEET) =   2004.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3782.59   CHANNEL SLOPE =  0.0190
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
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  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.56
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.164
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      265.32      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1269.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.39
  AVERAGE FLOW DEPTH(FEET) =   6.55   TRAVEL TIME(MIN.) =   7.51
  Tc(MIN.) =   68.28
  SUBAREA AREA(ACRES) =   265.32       SUBAREA RUNOFF(CFS) =  206.29
  EFFECTIVE AREA(ACRES) =   1699.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1699.1         PEAK FLOW RATE(CFS) =    1321.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.68   FLOW VELOCITY(FEET/SEC.) =   8.47
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.00 =   26681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10112.00 TO NODE  10112.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.03  DOWNSTREAM(FEET) =   1982.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1479.53   CHANNEL SLOPE =  0.0149
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.37
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.147
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      307.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1438.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.91
  AVERAGE FLOW DEPTH(FEET) =   7.36   TRAVEL TIME(MIN.) =   3.12
  Tc(MIN.) =   71.40
  SUBAREA AREA(ACRES) =   307.63       SUBAREA RUNOFF(CFS) =  234.59
  EFFECTIVE AREA(ACRES) =   2006.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.7         PEAK FLOW RATE(CFS) =    1530.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.57   FLOW VELOCITY(FEET/SEC.) =   8.04
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.50 =   28161.39 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1982.04  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3416.13   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.50
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.111
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1576.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.40
  AVERAGE FLOW DEPTH(FEET) =   7.50   TRAVEL TIME(MIN.) =   6.77
  Tc(MIN.) =   78.17
  SUBAREA AREA(ACRES) =   127.40       SUBAREA RUNOFF(CFS) =   93.01
  EFFECTIVE AREA(ACRES) =   2134.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2134.1         PEAK FLOW RATE(CFS) =    1558.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.46   FLOW VELOCITY(FEET/SEC.) =   8.38
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     2134.1  TC(MIN.) =     78.17
  EFFECTIVE AREA(ACRES) =   2134.14  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1558.02
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S2.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.935
   2)   10.00;  3.783
   3)   15.00;  2.788
   4)   20.00;  2.246
   5)   25.00;  1.939
   6)   30.00;  1.672
   7)   40.00;  1.481
   8)   50.00;  1.322
   9)   60.00;  1.211
  10)   90.00;  1.050
  11)  120.00;  0.950
  12)  180.00;  0.817
  13)  360.00;  0.636
  14) 1440.00;  0.289
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10200.00 TO NODE  10201.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   301.66
  ELEVATION DATA: UPSTREAM(FEET) =   3087.44  DOWNSTREAM(FEET) =   3031.53

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.910
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.09      0.30     1.000     0    9.71
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.54
  TOTAL AREA(ACRES) =      1.09   PEAK FLOW RATE(CFS) =      3.54

************************************************************************
  FLOW PROCESS FROM NODE  10201.00 TO NODE  10202.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3031.53  DOWNSTREAM(FEET) =   2903.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   538.03   CHANNEL SLOPE =  0.2382
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.418
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.22
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =   11.83
  SUBAREA AREA(ACRES) =     4.06       SUBAREA RUNOFF(CFS) =   11.39
  EFFECTIVE AREA(ACRES) =      5.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2          PEAK FLOW RATE(CFS) =      14.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   4.93
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10202.00 =     839.69 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10202.00 TO NODE  10203.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.38  DOWNSTREAM(FEET) =   2639.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1124.98   CHANNEL SLOPE =  0.2344
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.957
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.09
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   2.32
  Tc(MIN.) =   14.15
  SUBAREA AREA(ACRES) =    36.13       SUBAREA RUNOFF(CFS) =   86.40
  EFFECTIVE AREA(ACRES) =     41.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.3         PEAK FLOW RATE(CFS) =      98.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   9.73
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10203.00 =    1964.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10203.00 TO NODE  10204.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2639.65  DOWNSTREAM(FEET) =   2444.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.75   CHANNEL SLOPE =  0.1026
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.47
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.476
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     153.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.49
  AVERAGE FLOW DEPTH(FEET) =   1.41   TRAVEL TIME(MIN.) =   3.73
  Tc(MIN.) =   17.88
  SUBAREA AREA(ACRES) =    56.14       SUBAREA RUNOFF(CFS) =  109.95
  EFFECTIVE AREA(ACRES) =     97.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =     190.80
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.59   FLOW VELOCITY(FEET/SEC.) =   9.09
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10204.00 =    3862.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10204.00 TO NODE  10205.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2444.90  DOWNSTREAM(FEET) =   2245.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1973.02   CHANNEL SLOPE =  0.1010
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.55
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.199
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      264.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     417.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.41
  AVERAGE FLOW DEPTH(FEET) =   2.45   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   20.76
  SUBAREA AREA(ACRES) =   264.47       SUBAREA RUNOFF(CFS) =  452.10
  EFFECTIVE AREA(ACRES) =    361.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      361.9         PEAK FLOW RATE(CFS) =     618.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.02   FLOW VELOCITY(FEET/SEC.) =  12.75
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10205.00 =    5835.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10205.00 TO NODE  10206.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2245.64  DOWNSTREAM(FEET) =   2157.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1870.92   CHANNEL SLOPE =  0.0469
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.29
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.016
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      255.55      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     816.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.42
  AVERAGE FLOW DEPTH(FEET) =   4.24   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   23.75
  SUBAREA AREA(ACRES) =   255.55       SUBAREA RUNOFF(CFS) =  394.59
  EFFECTIVE AREA(ACRES) =    617.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      617.4          PEAK FLOW RATE(CFS) =     953.37
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.58   FLOW VELOCITY(FEET/SEC.) =  10.86
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.00 =    7706.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.00 TO NODE  10206.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2157.91  DOWNSTREAM(FEET) =   2119.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1453.59   CHANNEL SLOPE =  0.0266
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.55
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.863
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1052.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.04
  AVERAGE FLOW DEPTH(FEET) =   5.53   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   26.43
  SUBAREA AREA(ACRES) =   141.47       SUBAREA RUNOFF(CFS) =  198.96
  EFFECTIVE AREA(ACRES) =    758.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      758.9          PEAK FLOW RATE(CFS) =    1067.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.57   FLOW VELOCITY(FEET/SEC.) =   9.07
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.50 =    9159.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   2119.30  DOWNSTREAM(FEET) =   2093.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2020.48   CHANNEL SLOPE =  0.0129
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.83
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.649
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1131.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.05
  AVERAGE FLOW DEPTH(FEET) =   6.80   TRAVEL TIME(MIN.) =   4.78
  Tc(MIN.) =   31.21
  SUBAREA AREA(ACRES) =   105.39       SUBAREA RUNOFF(CFS) =  127.95
  EFFECTIVE AREA(ACRES) =    864.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      864.3          PEAK FLOW RATE(CFS) =    1067.30
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.61   FLOW VELOCITY(FEET/SEC.) =   6.95
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10220.00 =   11180.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.21
  RAINFALL INTENSITY(INCH/HR) =   1.65
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     864.30
  TOTAL STREAM AREA(ACRES) =     864.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1067.30

****************************************************************************
  FLOW PROCESS FROM NODE  10210.00 TO NODE  10211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   890.82
  ELEVATION DATA: UPSTREAM(FEET) =   2966.08  DOWNSTREAM(FEET) =   2867.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.601
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.614
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

```
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,BROADLEAF"       -        7.25      0.30     1.000     0   16.60
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     15.10
 TOTAL AREA(ACRES) =      7.25   PEAK FLOW RATE(CFS) =     15.10

****************************************************************************
 FLOW PROCESS FROM NODE  10211.00 TO NODE  10212.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2867.74  DOWNSTREAM(FEET) =   2763.75
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1682.06   CHANNEL SLOPE =  0.0618
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.85
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.087
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       33.02      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.97
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.69
 AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   5.98
 Tc(MIN.) =   22.58
 SUBAREA AREA(ACRES) =    33.02       SUBAREA RUNOFF(CFS) =   53.12
 EFFECTIVE AREA(ACRES) =     40.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       40.3         PEAK FLOW RATE(CFS) =      64.78
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.00

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   5.42
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10212.00 =    2572.88 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10212.00 TO NODE  10213.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2763.75  DOWNSTREAM(FEET) =   2662.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1206.59   CHANNEL SLOPE =  0.0842
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.921
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
 USER-DEFINED                -       71.89      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     117.28
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.30
 AVERAGE FLOW DEPTH(FEET) =   1.28   TRAVEL TIME(MIN.) =   2.75
 Tc(MIN.) =   25.34
 SUBAREA AREA(ACRES) =    71.89       SUBAREA RUNOFF(CFS) =  104.89
 EFFECTIVE AREA(ACRES) =    112.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      112.2         PEAK FLOW RATE(CFS) =     163.64
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.54

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.54   FLOW VELOCITY(FEET/SEC.) =   8.10
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10213.00 =    3779.47 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10213.00 TO NODE  10214.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2662.20  DOWNSTREAM(FEET) =   2520.73
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1783.17   CHANNEL SLOPE =  0.0793
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.751
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -      182.61      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     283.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.36
 AVERAGE FLOW DEPTH(FEET) =   2.12   TRAVEL TIME(MIN.) =   3.18
 Tc(MIN.) =   28.51
 SUBAREA AREA(ACRES) =   182.61       SUBAREA RUNOFF(CFS) =  238.54
 EFFECTIVE AREA(ACRES) =    294.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      294.8         PEAK FLOW RATE(CFS) =     385.06
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.51

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.51   FLOW VELOCITY(FEET/SEC.) =  10.23
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10214.00 =    5562.64 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10214.00 TO NODE  10215.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2520.73  DOWNSTREAM(FEET) =   2270.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2774.20   CHANNEL SLOPE =  0.0901
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.75
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.623
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      156.94      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     478.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.39
  AVERAGE FLOW DEPTH(FEET) =   2.72   TRAVEL TIME(MIN.) =   4.06
  Tc(MIN.) =   32.57
  SUBAREA AREA(ACRES) =   156.94       SUBAREA RUNOFF(CFS) =  186.86
  EFFECTIVE AREA(ACRES) =    451.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      451.7         PEAK FLOW RATE(CFS) =     537.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.89   FLOW VELOCITY(FEET/SEC.) =  11.77
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10215.00 =    8336.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10215.00 TO NODE  10216.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2270.71  DOWNSTREAM(FEET) =   2151.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.75   CHANNEL SLOPE =  0.0592
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.47
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.562
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      130.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     611.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.48
  AVERAGE FLOW DEPTH(FEET) =   3.45   TRAVEL TIME(MIN.) =   3.21
  Tc(MIN.) =   35.78
  SUBAREA AREA(ACRES) =   130.62       SUBAREA RUNOFF(CFS) =  148.31
  EFFECTIVE AREA(ACRES) =    582.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      582.3         PEAK FLOW RATE(CFS) =     661.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.59
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.59   FLOW VELOCITY(FEET/SEC.) =  10.72
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.00 =   10356.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.00 TO NODE  10216.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2151.20  DOWNSTREAM(FEET) =   2120.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1242.42   CHANNEL SLOPE =  0.0246
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.511
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     689.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.87
  AVERAGE FLOW DEPTH(FEET) =   4.57   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =   38.42
  SUBAREA AREA(ACRES) =    51.25       SUBAREA RUNOFF(CFS) =   55.87
  EFFECTIVE AREA(ACRES) =    633.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      633.6         PEAK FLOW RATE(CFS) =     690.71
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.58   FLOW VELOCITY(FEET/SEC.) =   7.87
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.50 =   11599.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2120.63  DOWNSTREAM(FEET) =   2093.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1301.06   CHANNEL SLOPE =  0.0210
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.81
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.460
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     704.37
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.47
  AVERAGE FLOW DEPTH(FEET) =   4.81   TRAVEL TIME(MIN.) =   2.90
  Tc(MIN.) =   41.32
  SUBAREA AREA(ACRES) =    26.16       SUBAREA RUNOFF(CFS) =   27.31
  EFFECTIVE AREA(ACRES) =    659.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      659.7         PEAK FLOW RATE(CFS) =     690.71
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.76   FLOW VELOCITY(FEET/SEC.) =   7.43
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.32
  RAINFALL INTENSITY(INCH/HR) =   1.46
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     659.74
  TOTAL STREAM AREA(ACRES) =     659.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     690.71

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1067.30   31.21    1.649  0.30( 0.30) 1.00     864.3   10200.00
      2      690.71   41.32    1.460  0.30( 0.30) 1.00     659.7   10210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1673.93   31.21    1.649  0.30( 0.30) 1.00    1362.6   10200.00
      2     1608.54   41.32    1.460  0.30( 0.30) 1.00    1524.0   10210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1673.93    Tc(MIN.) =    31.21
  EFFECTIVE AREA(ACRES) =    1362.59   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1524.0
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10220.00 TO NODE  10221.00 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2093.25  DOWNSTREAM(FEET) =   1965.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2966.11   CHANNEL SLOPE =  0.0430
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.572
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      104.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1733.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.30
  AVERAGE FLOW DEPTH(FEET) =   6.26   TRAVEL TIME(MIN.) =   4.02
  Tc(MIN.) =   35.23
  SUBAREA AREA(ACRES) =   104.45       SUBAREA RUNOFF(CFS) =  119.59
  EFFECTIVE AREA(ACRES) =   1467.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1628.5         PEAK FLOW RATE(CFS) =    1679.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.16   FLOW VELOCITY(FEET/SEC.) =  12.21
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.00 =   15866.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.00 TO NODE  10221.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1965.76  DOWNSTREAM(FEET) =   1950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1346.48   CHANNEL SLOPE =  0.0117
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.57
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.516
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      169.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1772.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.63
  AVERAGE FLOW DEPTH(FEET) =   8.56   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   38.17
  SUBAREA AREA(ACRES) =   169.50       SUBAREA RUNOFF(CFS) =  185.51
  EFFECTIVE AREA(ACRES) =   1636.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1798.0         PEAK FLOW RATE(CFS) =    1791.09
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.60   FLOW VELOCITY(FEET/SEC.) =   7.66
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.50 =   17212.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1950.00  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1849.80   CHANNEL SLOPE =  0.0131
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.449
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1813.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.00
  AVERAGE FLOW DEPTH(FEET) =   8.44   TRAVEL TIME(MIN.) =   3.85
  Tc(MIN.) =   42.02
  SUBAREA AREA(ACRES) =    43.12       SUBAREA RUNOFF(CFS) =   44.59
  EFFECTIVE AREA(ACRES) =   1679.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1841.1         PEAK FLOW RATE(CFS) =    1791.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.39   FLOW VELOCITY(FEET/SEC.) =   7.98
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1841.1  TC(MIN.) =     42.02
  EFFECTIVE AREA(ACRES) =   1679.66  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1791.09

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1791.09   42.02    1.449  0.30( 0.30) 1.00    1679.7   10200.00
      2     1696.09   52.27    1.297  0.30( 0.30) 1.00    1841.1   10210.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S3.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.949
   2)   10.00;  3.791
   3)   15.00;  2.793
   4)   20.00;  2.249
   5)   25.00;  1.941
   6)   30.00;  1.674
   7)   40.00;  1.483
   8)   50.00;  1.324
   9)   60.00;  1.213
  10)   90.00;  1.052
  11)  120.00;  0.952
  12)  180.00;  0.819
  13)  360.00;  0.638
  14) 1440.00;  0.290
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10300.00 TO NODE  10301.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.52
  ELEVATION DATA: UPSTREAM(FEET) =   4227.21  DOWNSTREAM(FEET) =   4064.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.977
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.664
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.00      0.30     1.000     0    7.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.93
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      3.93

************************************************************************
  FLOW PROCESS FROM NODE  10301.00 TO NODE  10302.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4064.64  DOWNSTREAM(FEET) =   3797.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =   631.34   CHANNEL SLOPE =  0.4235
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.883
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.23      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.82
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   1.81
  Tc(MIN.) =    9.79
  SUBAREA AREA(ACRES) =     6.23       SUBAREA RUNOFF(CFS) =   20.09
  EFFECTIVE AREA(ACRES) =      7.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2          PEAK FLOW RATE(CFS) =      23.32
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =   7.08
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10302.00 =     941.86 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10302.00 TO NODE  10303.00 IS CODE =  56
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3797.25  DOWNSTREAM(FEET) =   3447.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1908.89   CHANNEL SLOPE =  0.1834
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.016
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.76
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   4.10
  Tc(MIN.) =   13.88
  SUBAREA AREA(ACRES) =    32.83       SUBAREA RUNOFF(CFS) =   80.24
  EFFECTIVE AREA(ACRES) =     40.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =      97.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   8.92
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10303.00 =    2850.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10303.00 TO NODE  10304.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3447.07  DOWNSTREAM(FEET) =   3228.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.05   CHANNEL SLOPE =  0.1140
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.46
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.524
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     158.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.91
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   3.59
  Tc(MIN.) =   17.47
  SUBAREA AREA(ACRES) =    60.51       SUBAREA RUNOFF(CFS) =  121.12
  EFFECTIVE AREA(ACRES) =    100.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.6         PEAK FLOW RATE(CFS) =     201.30
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.59   FLOW VELOCITY(FEET/SEC.) =   9.59
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10304.00 =    4768.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10304.00 TO NODE  10305.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3228.48  DOWNSTREAM(FEET) =   3118.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1679.40   CHANNEL SLOPE =  0.0656
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.38
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.211
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     301.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.91
  AVERAGE FLOW DEPTH(FEET) =   2.31   TRAVEL TIME(MIN.) =   3.14
  Tc(MIN.) =   20.61
  SUBAREA AREA(ACRES) =   116.56       SUBAREA RUNOFF(CFS) =  200.49
  EFFECTIVE AREA(ACRES) =    217.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      217.1         PEAK FLOW RATE(CFS) =     373.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.60   FLOW VELOCITY(FEET/SEC.) =   9.47
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10305.00 =    6448.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10305.00 TO NODE  10306.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3118.37  DOWNSTREAM(FEET) =   2807.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2853.67   CHANNEL SLOPE =  0.1088
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.75
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.976
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      189.23      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     516.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.44
  AVERAGE FLOW DEPTH(FEET) =   2.70   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   24.44
  SUBAREA AREA(ACRES) =   189.23       SUBAREA RUNOFF(CFS) =  285.40
  EFFECTIVE AREA(ACRES) =    406.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      406.4          PEAK FLOW RATE(CFS) =     612.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.95   FLOW VELOCITY(FEET/SEC.) =  13.07
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10306.00 =    9301.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10306.00 TO NODE  10307.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2807.99  DOWNSTREAM(FEET) =   2591.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2848.03   CHANNEL SLOPE =  0.0759
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.01
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.771
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      416.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     889.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.69
  AVERAGE FLOW DEPTH(FEET) =   3.92   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   28.18
  SUBAREA AREA(ACRES) =   416.51       SUBAREA RUNOFF(CFS) =  551.59
  EFFECTIVE AREA(ACRES) =    822.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      822.9          PEAK FLOW RATE(CFS) =    1089.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.34   FLOW VELOCITY(FEET/SEC.) =  13.42
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10307.00 =   12149.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10307.00 TO NODE  10308.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   2591.87  DOWNSTREAM(FEET) =   2516.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.06   CHANNEL SLOPE =  0.0263
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.14
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.613
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.49      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1279.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.49
  AVERAGE FLOW DEPTH(FEET) =   6.09   TRAVEL TIME(MIN.) =   5.03
  Tc(MIN.) =   33.21
  SUBAREA AREA(ACRES) =   320.49       SUBAREA RUNOFF(CFS) =  379.89
  EFFECTIVE AREA(ACRES) =   1143.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1143.4          PEAK FLOW RATE(CFS) =    1352.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.25   FLOW VELOCITY(FEET/SEC.) =   9.61
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.00 =   15011.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.00 TO NODE  10308.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2516.62  DOWNSTREAM(FEET) =   2462.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.32   CHANNEL SLOPE =  0.0288
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.36
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.554
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.88      0.30     0.966     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.966
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1461.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.15
  AVERAGE FLOW DEPTH(FEET) =   6.34   TRAVEL TIME(MIN.) =   3.10
  Tc(MIN.) =   36.31
  SUBAREA AREA(ACRES) =   191.88       SUBAREA RUNOFF(CFS) =  218.25
  EFFECTIVE AREA(ACRES) =   1335.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1335.2          PEAK FLOW RATE(CFS) =    1509.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.44
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.44   FLOW VELOCITY(FEET/SEC.) =  10.23
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.50 =   16901.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.50 TO NODE  10309.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.25  DOWNSTREAM(FEET) =   2409.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1874.33   CHANNEL SLOPE =  0.0279
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.59
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.495
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1557.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.21
  AVERAGE FLOW DEPTH(FEET) =   6.59   TRAVEL TIME(MIN.) =   3.06
  Tc(MIN.) =   39.37
  SUBAREA AREA(ACRES) =    90.14       SUBAREA RUNOFF(CFS) =   96.96
  EFFECTIVE AREA(ACRES) =   1425.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1425.4         PEAK FLOW RATE(CFS) =    1536.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.54   FLOW VELOCITY(FEET/SEC.) =  10.17
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10309.00 =   18775.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2409.87  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2576.20   CHANNEL SLOPE =  0.0310
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.47
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.429
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1578.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.63
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  AVERAGE FLOW DEPTH(FEET) =   6.47   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   43.41
  SUBAREA AREA(ACRES) =    83.83       SUBAREA RUNOFF(CFS) =   85.17
  EFFECTIVE AREA(ACRES) =   1509.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1509.2         PEAK FLOW RATE(CFS) =    1536.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.39   FLOW VELOCITY(FEET/SEC.) =  10.56
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   43.41
  RAINFALL INTENSITY(INCH/HR) =   1.43
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =    1509.21
  TOTAL STREAM AREA(ACRES) =    1509.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1536.33

****************************************************************************
  FLOW PROCESS FROM NODE  10320.00 TO NODE  10321.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.56
  ELEVATION DATA: UPSTREAM(FEET) =   3374.80  DOWNSTREAM(FEET) =   3300.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.959
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.240
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.24      0.30     1.000     0    8.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.94
  TOTAL AREA(ACRES) =      2.24   PEAK FLOW RATE(CFS) =      7.94

****************************************************************************
  FLOW PROCESS FROM NODE  10321.00 TO NODE  10322.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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 ELEVATION DATA: UPSTREAM(FEET) =   3300.24  DOWNSTREAM(FEET) =   3187.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =   581.07   CHANNEL SLOPE =  0.1945
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.588
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        5.01      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.39
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.71
 AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   2.06
 Tc(MIN.) =   11.02
 SUBAREA AREA(ACRES) =     5.01       SUBAREA RUNOFF(CFS) =   14.83
 EFFECTIVE AREA(ACRES) =      7.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =        7.2         PEAK FLOW RATE(CFS) =      21.46
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =   5.38
 LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10322.00 =     871.63 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10322.00 TO NODE  10323.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3187.21  DOWNSTREAM(FEET) =   3108.86
 CHANNEL LENGTH THRU SUBAREA(FEET) =   977.98   CHANNEL SLOPE =  0.0801
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.94
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.021
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       30.37      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.96
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.74
 AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   2.84
 Tc(MIN.) =   13.86
 SUBAREA AREA(ACRES) =    30.37       SUBAREA RUNOFF(CFS) =   74.38
 EFFECTIVE AREA(ACRES) =     37.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =      92.14
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
```



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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =   6.64
 LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10323.00 =    1849.61 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10323.00 TO NODE  10324.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3108.86  DOWNSTREAM(FEET) =   2923.03
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.11   CHANNEL SLOPE =  0.0966
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.55
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.505
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       68.88      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     160.81
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.46
 AVERAGE FLOW DEPTH(FEET) =   1.47   TRAVEL TIME(MIN.) =   3.79
 Tc(MIN.) =   17.65
 SUBAREA AREA(ACRES) =    68.88       SUBAREA RUNOFF(CFS) =  136.68
 EFFECTIVE AREA(ACRES) =    106.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      106.5         PEAK FLOW RATE(CFS) =     211.33
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =   9.18
 LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10324.00 =    3773.72 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10324.00 TO NODE  10325.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2923.03  DOWNSTREAM(FEET) =   2675.11
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2788.58   CHANNEL SLOPE =  0.0889
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.33
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.113
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      146.19      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     331.01
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.20
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  AVERAGE FLOW DEPTH(FEET) =   2.24   TRAVEL TIME(MIN.) =   4.55
  Tc(MIN.) =   22.20
  SUBAREA AREA(ACRES) =   146.19       SUBAREA RUNOFF(CFS) =  238.58
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =     412.39
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.52   FLOW VELOCITY(FEET/SEC.) =  10.87
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10325.00 =    6562.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10325.00 TO NODE  10326.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2675.11  DOWNSTREAM(FEET) =   2541.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.28   CHANNEL SLOPE =  0.0465
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.828
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      321.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     634.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.70
  AVERAGE FLOW DEPTH(FEET) =   3.74   TRAVEL TIME(MIN.) =   4.92
  Tc(MIN.) =   27.12
  SUBAREA AREA(ACRES) =   321.78       SUBAREA RUNOFF(CFS) =  442.42
  EFFECTIVE AREA(ACRES) =    574.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      574.5         PEAK FLOW RATE(CFS) =     789.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.18   FLOW VELOCITY(FEET/SEC.) =  10.30
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.00 =    9424.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10326.00 TO NODE  10326.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2541.92  DOWNSTREAM(FEET) =   2438.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2617.40   CHANNEL SLOPE =  0.0394
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
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  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.646
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      187.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     903.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.04
  AVERAGE FLOW DEPTH(FEET) =   4.66   TRAVEL TIME(MIN.) =   4.35
  Tc(MIN.) =   31.47
  SUBAREA AREA(ACRES) =   187.06       SUBAREA RUNOFF(CFS) =  226.60
  EFFECTIVE AREA(ACRES) =    761.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      761.5         PEAK FLOW RATE(CFS) =     922.51
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.70   FLOW VELOCITY(FEET/SEC.) =  10.10
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.50 =   12041.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10326.50 TO NODE  10327.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2438.80  DOWNSTREAM(FEET) =   2414.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1181.79   CHANNEL SLOPE =  0.0204
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.599
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     970.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.04
  AVERAGE FLOW DEPTH(FEET) =   5.66   TRAVEL TIME(MIN.) =   2.45
  Tc(MIN.) =   33.92
  SUBAREA AREA(ACRES) =    82.27       SUBAREA RUNOFF(CFS) =   96.19
  EFFECTIVE AREA(ACRES) =    843.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      843.8         PEAK FLOW RATE(CFS) =     986.61
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.71   FLOW VELOCITY(FEET/SEC.) =   8.07
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.00 =   13223.77 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  10327.00 TO NODE  10327.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2414.64  DOWNSTREAM(FEET) =   2389.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2431.92   CHANNEL SLOPE =  0.0102
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.17
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.480
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      243.69      0.30     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1116.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.45
  AVERAGE FLOW DEPTH(FEET) =   7.13   TRAVEL TIME(MIN.) =   6.28
  Tc(MIN.) =   40.20
  SUBAREA AREA(ACRES) =   243.69       SUBAREA RUNOFF(CFS) =  258.96
  EFFECTIVE AREA(ACRES) =   1087.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1087.5         PEAK FLOW RATE(CFS) =    1154.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.25   FLOW VELOCITY(FEET/SEC.) =   6.51
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.50 =   15655.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2389.73  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.59   CHANNEL SLOPE =  0.0306
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.427
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1190.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.85
  AVERAGE FLOW DEPTH(FEET) =   5.67   TRAVEL TIME(MIN.) =   3.29
  Tc(MIN.) =   43.50
  SUBAREA AREA(ACRES) =    69.36       SUBAREA RUNOFF(CFS) =   70.38
  EFFECTIVE AREA(ACRES) =   1156.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
```



```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1156.8         PEAK FLOW RATE(CFS) =    1174.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.63   FLOW VELOCITY(FEET/SEC.) =   9.82
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10330.00 =   17600.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   43.50
  RAINFALL INTENSITY(INCH/HR) =   1.43
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1156.85
  TOTAL STREAM AREA(ACRES) =    1156.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1174.11

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1536.33   43.41    1.429  0.30( 0.30) 0.99    1509.2   10300.00
      2     1174.11   43.50    1.427  0.30( 0.30) 1.00    1156.8   10320.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2709.52   43.41    1.429  0.30( 0.30) 1.00    2663.7   10300.00
      2     2708.54   43.50    1.427  0.30( 0.30) 1.00    2666.1   10320.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2709.52    Tc(MIN.) =    43.41
  EFFECTIVE AREA(ACRES) =    2663.72   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2666.1
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10330.00 TO NODE  10331.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2330.13  DOWNSTREAM(FEET) =   2041.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3034.53   CHANNEL SLOPE =  0.0951
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

```
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   6.45
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.386
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -       70.23      0.30     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2743.83
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.60
AVERAGE FLOW DEPTH(FEET) =   6.44   TRAVEL TIME(MIN.) =   2.72
Tc(MIN.) =   46.13
SUBAREA AREA(ACRES) =    70.23       SUBAREA RUNOFF(CFS) =   68.62
EFFECTIVE AREA(ACRES) =   2733.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =     2736.3         PEAK FLOW RATE(CFS) =    2709.52
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   6.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  6.41   FLOW VELOCITY(FEET/SEC.) =  18.54
LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10331.00 =   24386.34 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2041.66  DOWNSTREAM(FEET) =   1739.96
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3264.87   CHANNEL SLOPE =  0.0924
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.51
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.339
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -      104.94      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2758.57
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.43
 AVERAGE FLOW DEPTH(FEET) =   6.51   TRAVEL TIME(MIN.) =   2.95
 Tc(MIN.) =   49.08
 SUBAREA AREA(ACRES) =   104.94       SUBAREA RUNOFF(CFS) =   98.10
 EFFECTIVE AREA(ACRES) =   2838.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2841.2         PEAK FLOW RATE(CFS) =    2709.52
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.45

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



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 DEPTH(FEET) =  6.45   FLOW VELOCITY(FEET/SEC.) =  18.35
 LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S1.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1558.02   78.17  0.30( 0.30) 1.00    2134.1   10100.00
   TOTAL AREA(ACRES) =     2134.1

****************************************************************************
 FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S2.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1791.09   42.02  0.30( 0.30) 1.00    1679.7   10200.00
     2     1696.09   52.27  0.30( 0.30) 1.00    1841.1   10210.00
   TOTAL AREA(ACRES) =     1841.1

****************************************************************************
 FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1791.09   42.02  0.30( 0.30) 1.00    1679.7   10200.00
     2     1696.09   52.27  0.30( 0.30) 1.00    1841.1   10210.00
   TOTAL AREA(ACRES) =      1841.1

****************************************************************************
 FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1791.09   42.02    1.451  0.30( 0.30) 1.00    1679.7   10200.00
     2     1696.09   52.27    1.299  0.30( 0.30) 1.00    1841.1   10210.00
```

```
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1558.02   78.17    1.115  0.30( 0.30) 1.00    2134.1   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2973.05   42.02    1.451  0.30( 0.30) 1.00    2826.9   10200.00
     2     2972.04   52.27    1.299  0.30( 0.30) 1.00    3268.1   10210.00
     3     2942.81   78.17    1.115  0.30( 0.30) 1.00    3975.2   10100.00
   TOTAL AREA(ACRES) =      3975.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     2973.05  Tc(MIN.) =   42.022
 EFFECTIVE AREA(ACRES) =   2826.93  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3975.2
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10222.00 TO NODE  10332.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1925.82  DOWNSTREAM(FEET) =   1739.96
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1475.92   CHANNEL SLOPE =  0.1259
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.27
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.432
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -       19.92      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2983.21
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.09
 AVERAGE FLOW DEPTH(FEET) =   6.27   TRAVEL TIME(MIN.) =   1.17
 Tc(MIN.) =   43.19
 SUBAREA AREA(ACRES) =    19.92       SUBAREA RUNOFF(CFS) =   20.30
 EFFECTIVE AREA(ACRES) =   2846.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3995.2         PEAK FLOW RATE(CFS) =    2973.05
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.26

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.26   FLOW VELOCITY(FEET/SEC.) =  21.08
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.
```



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****************************************************************************
 FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2973.05   43.19    1.432  0.30( 0.30) 1.00    2846.9   10200.00
     2     2972.04   53.43    1.286  0.30( 0.30) 1.00    3288.0   10210.00
     3     2942.81   79.34    1.109  0.30( 0.30) 1.00    3995.2   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2709.52   49.08    1.339  0.30( 0.30) 1.00    2838.9   10300.00
     2     2708.54   49.17    1.337  0.30( 0.30) 1.00    2841.2   10320.00
 LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5572.13   43.19    1.432  0.30( 0.30) 1.00    5345.1   10200.00
     2     5681.99   49.08    1.339  0.30( 0.30) 1.00    5939.4   10300.00
     3     5681.01   49.17    1.337  0.30( 0.30) 1.00    5945.6   10320.00
     4     5546.71   53.43    1.286  0.30( 0.30) 1.00    6129.2   10210.00
     5     5056.70   79.34    1.109  0.30( 0.30) 1.00    6836.4   10100.00
   TOTAL AREA(ACRES) =      6836.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     5681.99  Tc(MIN.) =   49.078
 EFFECTIVE AREA(ACRES) =   5939.37  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     6836.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     6836.4  TC(MIN.) =     49.08
 EFFECTIVE AREA(ACRES) =   5939.37  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.998
 PEAK FLOW RATE(CFS)   =    5681.99

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5572.13   43.19    1.432  0.30( 0.30) 1.00    5345.1   10200.00
     2     5681.99   49.08    1.339  0.30( 0.30) 1.00    5939.4   10300.00
     3     5681.01   49.17    1.337  0.30( 0.30) 1.00    5945.6   10320.00
     4     5546.71   53.43    1.286  0.30( 0.30) 1.00    6129.2   10210.00
     5     5056.70   79.34    1.109  0.30( 0.30) 1.00    6836.4   10100.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S4.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.884
   2)   10.00;  3.754
   3)   15.00;  2.771
   4)   20.00;  2.234
   5)   25.00;  1.930
   6)   30.00;  1.665
   7)   40.00;  1.474
   8)   50.00;  1.315
   9)   60.00;  1.204
  10)   90.00;  1.043
  11)  120.00;  0.942
  12)  180.00;  0.809
  13)  360.00;  0.628
  14) 1440.00;  0.285
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10400.00 TO NODE  10401.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.42
  ELEVATION DATA: UPSTREAM(FEET) =   2648.70  DOWNSTREAM(FEET) =   2536.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.799
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.578
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.89      0.30     1.000     0   16.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.07
  TOTAL AREA(ACRES) =      5.89   PEAK FLOW RATE(CFS) =     12.07

**************************************************************************
  FLOW PROCESS FROM NODE  10401.00 TO NODE  10402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2536.15  DOWNSTREAM(FEET) =   2504.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   934.06   CHANNEL SLOPE =  0.0340
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.76
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.143
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.31
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   4.70
  Tc(MIN.) =   21.50
  SUBAREA AREA(ACRES) =    17.57       SUBAREA RUNOFF(CFS) =   29.14
  EFFECTIVE AREA(ACRES) =     23.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.5          PEAK FLOW RATE(CFS) =      38.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   3.75
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.00 =    1884.48 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10402.00 TO NODE  10402.50 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2504.36  DOWNSTREAM(FEET) =   2462.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.55   CHANNEL SLOPE =  0.0439
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.958
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.21
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   24.54
  SUBAREA AREA(ACRES) =    56.74       SUBAREA RUNOFF(CFS) =   84.67
  EFFECTIVE AREA(ACRES) =     80.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       80.2         PEAK FLOW RATE(CFS) =     119.68
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.55   FLOW VELOCITY(FEET/SEC.) =   5.88
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.50 =    2836.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10402.50 TO NODE  10403.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.54  DOWNSTREAM(FEET) =   2433.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.41   CHANNEL SLOPE =  0.0299
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.10
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.803
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     165.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.66
  AVERAGE FLOW DEPTH(FEET) =   2.07   TRAVEL TIME(MIN.) =   2.85
  Tc(MIN.) =   27.39
  SUBAREA AREA(ACRES) =    68.01       SUBAREA RUNOFF(CFS) =   92.03
  EFFECTIVE AREA(ACRES) =    148.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      148.2         PEAK FLOW RATE(CFS) =     200.55
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.29   FLOW VELOCITY(FEET/SEC.) =   5.99
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10403.00 =    3803.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10403.00 TO NODE  10404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2433.59  DOWNSTREAM(FEET) =   2239.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2934.12   CHANNEL SLOPE =  0.0662
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.617
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      301.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     379.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.54
  AVERAGE FLOW DEPTH(FEET) =   2.61   TRAVEL TIME(MIN.) =   5.13
  Tc(MIN.) =   32.51
  SUBAREA AREA(ACRES) =   301.25       SUBAREA RUNOFF(CFS) =  357.09
  EFFECTIVE AREA(ACRES) =    449.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      449.5         PEAK FLOW RATE(CFS) =     532.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.12   FLOW VELOCITY(FEET/SEC.) =  10.50
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10404.00 =    6737.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10404.00 TO NODE  10405.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2239.33  DOWNSTREAM(FEET) =   2128.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.32   CHANNEL SLOPE =  0.0386
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.89
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.516
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      152.68      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     616.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.99
  AVERAGE FLOW DEPTH(FEET) =   3.87   TRAVEL TIME(MIN.) =   5.30
  Tc(MIN.) =   37.82
  SUBAREA AREA(ACRES) =   152.68       SUBAREA RUNOFF(CFS) =  167.06
  EFFECTIVE AREA(ACRES) =    602.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      602.1          PEAK FLOW RATE(CFS) =     658.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.00   FLOW VELOCITY(FEET/SEC.) =   9.15
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10405.00 =    9599.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2128.80  DOWNSTREAM(FEET) =   1759.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.12   CHANNEL SLOPE =  0.1878
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.81
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.478
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      139.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     732.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.74
  AVERAGE FLOW DEPTH(FEET) =   2.80   TRAVEL TIME(MIN.) =   1.96
  Tc(MIN.) =   39.78
  SUBAREA AREA(ACRES) =   139.70       SUBAREA RUNOFF(CFS) =  148.15
  EFFECTIVE AREA(ACRES) =    741.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      741.8          PEAK FLOW RATE(CFS) =     786.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.91   FLOW VELOCITY(FEET/SEC.) =  17.08
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10420.00 =   11566.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   39.78
  RAINFALL INTENSITY(INCH/HR) =   1.48
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     741.84
  TOTAL STREAM AREA(ACRES) =     741.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     786.73

****************************************************************************
  FLOW PROCESS FROM NODE  10410.00 TO NODE  10411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   413.10
  ELEVATION DATA: UPSTREAM(FEET) =   3217.26  DOWNSTREAM(FEET) =   3058.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.517
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.960
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        3.06      0.30     1.000     0    9.52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.08
  TOTAL AREA(ACRES) =      3.06   PEAK FLOW RATE(CFS) =     10.08

****************************************************************************
  FLOW PROCESS FROM NODE  10411.00 TO NODE  10412.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3058.86  DOWNSTREAM(FEET) =   2879.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.18   CHANNEL SLOPE =  0.3495
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.563
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.87
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.46
  Tc(MIN.) =   10.97
  SUBAREA AREA(ACRES) =     4.24       SUBAREA RUNOFF(CFS) =   12.45
  EFFECTIVE AREA(ACRES) =      7.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.3          PEAK FLOW RATE(CFS) =      21.44
```

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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   6.39
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10412.00 =     925.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10412.00 TO NODE  10413.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.84  DOWNSTREAM(FEET) =   2644.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.24   CHANNEL SLOPE =  0.1208
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.713
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.10
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   4.56
  Tc(MIN.) =   15.54
  SUBAREA AREA(ACRES) =    47.95       SUBAREA RUNOFF(CFS) =  104.15
  EFFECTIVE AREA(ACRES) =     55.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.2         PEAK FLOW RATE(CFS) =     120.01
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   8.31
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10413.00 =    2869.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10413.00 TO NODE  10414.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2644.97  DOWNSTREAM(FEET) =   2550.42
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.61   CHANNEL SLOPE =  0.0468
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.46
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.233
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.60      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     252.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.50
  AVERAGE FLOW DEPTH(FEET) =   2.31   TRAVEL TIME(MIN.) =   4.49
  Tc(MIN.) =   20.02
  SUBAREA AREA(ACRES) =   151.60       SUBAREA RUNOFF(CFS) =  263.69
  EFFECTIVE AREA(ACRES) =    206.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.9          PEAK FLOW RATE(CFS) =     359.79
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.78   FLOW VELOCITY(FEET/SEC.) =   8.31
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10414.00 =    4889.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10414.00 TO NODE  10415.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2550.42  DOWNSTREAM(FEET) =   2391.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.76   CHANNEL SLOPE =  0.0830
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.96
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.061
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      206.03      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     523.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.33
  AVERAGE FLOW DEPTH(FEET) =   2.92   TRAVEL TIME(MIN.) =   2.82
  Tc(MIN.) =   22.84
  SUBAREA AREA(ACRES) =   206.03       SUBAREA RUNOFF(CFS) =  326.56
  EFFECTIVE AREA(ACRES) =    412.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      412.9          PEAK FLOW RATE(CFS) =     654.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.28   FLOW VELOCITY(FEET/SEC.) =  12.07
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10415.00 =    6805.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10415.00 TO NODE  10416.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   2391.31  DOWNSTREAM(FEET) =   2092.16
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2843.10   CHANNEL SLOPE =  0.1052
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.860
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      122.38      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     740.37
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.61
 AVERAGE FLOW DEPTH(FEET) =   3.28   TRAVEL TIME(MIN.) =   3.48
 Tc(MIN.) =   26.33
 SUBAREA AREA(ACRES) =   122.38       SUBAREA RUNOFF(CFS) =  171.80
 EFFECTIVE AREA(ACRES) =    535.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      535.3         PEAK FLOW RATE(CFS) =     751.41
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.31   FLOW VELOCITY(FEET/SEC.) =  13.67
 LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10416.00 =    9648.99 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2092.16  DOWNSTREAM(FEET) =   1759.52
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2151.95   CHANNEL SLOPE =  0.1546
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.08
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.740
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       59.94      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     790.26
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.94
 AVERAGE FLOW DEPTH(FEET) =   3.07   TRAVEL TIME(MIN.) =   2.25
 Tc(MIN.) =   28.58
 SUBAREA AREA(ACRES) =    59.94       SUBAREA RUNOFF(CFS) =   77.71
 EFFECTIVE AREA(ACRES) =    595.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      595.2         PEAK FLOW RATE(CFS) =     771.66
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.03
```



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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.03   FLOW VELOCITY(FEET/SEC.) =  15.83
 LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   28.58
 RAINFALL INTENSITY(INCH/HR) =   1.74
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     595.20
 TOTAL STREAM AREA(ACRES) =     595.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     771.66

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      786.73   39.78    1.478  0.30( 0.30) 1.00     741.8   10400.00
     2      771.66   28.58    1.740  0.30( 0.30) 1.00     595.2   10410.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1462.62   28.58    1.740  0.30( 0.30) 1.00    1128.2   10410.00
     2     1417.94   39.78    1.478  0.30( 0.30) 1.00    1337.0   10400.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1462.62    Tc(MIN.) =    28.58
 EFFECTIVE AREA(ACRES) =    1128.16   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1337.0
 LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1759.52  DOWNSTREAM(FEET) =   1688.35
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2477.21   CHANNEL SLOPE =  0.0287
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.45
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.615
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -       72.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1505.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.21
  AVERAGE FLOW DEPTH(FEET) =   6.44   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   32.62
  SUBAREA AREA(ACRES) =    72.64       SUBAREA RUNOFF(CFS) =   85.97
  EFFECTIVE AREA(ACRES) =   1200.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1409.7          PEAK FLOW RATE(CFS) =    1462.62
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.35   FLOW VELOCITY(FEET/SEC.) =  10.14
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S3.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     5572.13   43.19  0.30( 0.30) 1.00    5345.1   10200.00
      2     5681.99   49.08  0.30( 0.30) 1.00    5939.4   10300.00
      3     5681.01   49.17  0.30( 0.30) 1.00    5945.6   10320.00
      4     5546.71   53.43  0.30( 0.30) 1.00    6129.2   10210.00
      5     5056.70   79.34  0.30( 0.30) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =     6836.4

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     5572.13   43.19  0.30( 0.30) 1.00    5345.1   10200.00
      2     5681.99   49.08  0.30( 0.30) 1.00    5939.4   10300.00
      3     5681.01   49.17  0.30( 0.30) 1.00    5945.6   10320.00
      4     5546.71   53.43  0.30( 0.30) 1.00    6129.2   10210.00
      5     5056.70   79.34  0.30( 0.30) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =      6836.4
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1739.96  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2238.93   CHANNEL SLOPE =  0.0231
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.57
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.291
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5709.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.96
  AVERAGE FLOW DEPTH(FEET) =   8.57   TRAVEL TIME(MIN.) =   3.12
  Tc(MIN.) =   52.20
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =   55.22
  EFFECTIVE AREA(ACRES) =   6001.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6898.3          PEAK FLOW RATE(CFS) =    5681.99
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.55   FLOW VELOCITY(FEET/SEC.) =  11.94
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     5572.13   46.33    1.373  0.30( 0.30) 1.00    5407.0   10200.00
      2     5681.99   52.20    1.291  0.30( 0.30) 1.00    6001.3   10300.00
      3     5681.01   52.29    1.290  0.30( 0.30) 1.00    6007.5   10320.00
      4     5546.71   56.57    1.242  0.30( 0.30) 1.00    6191.2   10210.00
      5     5056.70   82.56    1.083  0.30( 0.30) 1.00    6898.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     1462.62   32.62    1.615  0.30( 0.30) 1.00    1200.8   10410.00
      2     1417.94   43.85    1.413  0.30( 0.30) 1.00    1409.7   10400.00
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6268.49	32.62	1.615	0.30(0.30)	1.00	5008.0	10410.00
2	6885.77	43.85	1.413	0.30(0.30)	1.00	6528.2	10400.00
3	6939.99	46.33	1.373	0.30(0.30)	1.00	6816.7	10200.00
4	6944.30	52.20	1.291	0.30(0.30)	1.00	7411.0	10300.00
5	6942.04	52.29	1.290	0.30(0.30)	1.00	7417.2	10320.00
6	6747.15	56.57	1.242	0.30(0.30)	1.00	7600.9	10210.00
7	6054.41	82.56	1.083	0.30(0.30)	1.00	8308.0	10100.00

TOTAL AREA(ACRES) = 8308.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 6944.30 Tc(MIN.) = 52.199
EFFECTIVE AREA(ACRES) = 7410.98 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 8308.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 8308.0 TC(MIN.) = 52.20
EFFECTIVE AREA(ACRES) = 7410.98 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998
PEAK FLOW RATE(CFS) = 6944.30

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6268.49	32.62	1.615	0.30(0.30)	1.00	5008.0	10410.00
2	6885.77	43.85	1.413	0.30(0.30)	1.00	6528.2	10400.00
3	6939.99	46.33	1.373	0.30(0.30)	1.00	6816.7	10200.00
4	6944.30	52.20	1.291	0.30(0.30)	1.00	7411.0	10300.00
5	6942.04	52.29	1.290	0.30(0.30)	1.00	7417.2	10320.00
6	6747.15	56.57	1.242	0.30(0.30)	1.00	7600.9	10210.00
7	6054.41	82.56	1.083	0.30(0.30)	1.00	8308.0	10100.00

==========

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S5.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.884
   2)   10.00;  3.754
   3)   15.00;  2.771
   4)   20.00;  2.234
   5)   25.00;  1.930
   6)   30.00;  1.665
   7)   40.00;  1.474
   8)   50.00;  1.315
   9)   60.00;  1.204
  10)   90.00;  1.043
  11)  120.00;  0.942
  12)  180.00;  0.809
  13)  360.00;  0.628
  14) 1440.00;  0.285
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10500.00 TO NODE  10501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.64
  ELEVATION DATA: UPSTREAM(FEET) =   3108.31  DOWNSTREAM(FEET) =   3060.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.565
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  5.217
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          -        1.54      0.30      0.910     0    6.57
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
  SUBAREA RUNOFF(CFS) =      6.85
  TOTAL AREA(ACRES) =      1.54   PEAK FLOW RATE(CFS) =      6.85

**************************************************************************
  FLOW PROCESS FROM NODE  10501.00 TO NODE  10502.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3060.24  DOWNSTREAM(FEET) =   2942.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.48   CHANNEL SLOPE =  0.1703
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.42
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.271
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.27      0.30      0.943     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.943
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.18
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   2.22
  Tc(MIN.) =    8.79
  SUBAREA AREA(ACRES) =     8.27       SUBAREA RUNOFF(CFS) =   29.68
  EFFECTIVE AREA(ACRES) =      9.81     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =        9.8          PEAK FLOW RATE(CFS) =      35.22
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   6.11
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10502.00 =     986.12 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10502.00 TO NODE  10503.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2942.64  DOWNSTREAM(FEET) =   2815.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   957.31   CHANNEL SLOPE =  0.1331
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.541
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.95
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   2.30
  Tc(MIN.) =   11.08
  SUBAREA AREA(ACRES) =    18.91       SUBAREA RUNOFF(CFS) =   55.16
  EFFECTIVE AREA(ACRES) =     28.72     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       28.7         PEAK FLOW RATE(CFS) =      83.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   7.63
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10503.00 =    1943.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10503.00 TO NODE  10504.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2815.24  DOWNSTREAM(FEET) =   2202.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2096.20   CHANNEL SLOPE =  0.2923
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.000
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.49      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     176.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.70
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   2.75
  Tc(MIN.) =   13.84
  SUBAREA AREA(ACRES) =    75.49       SUBAREA RUNOFF(CFS) =  183.43
  EFFECTIVE AREA(ACRES) =    104.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =     253.39
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.39   FLOW VELOCITY(FEET/SEC.) =  14.25
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10504.00 =    4039.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10504.00 TO NODE  10505.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2202.44  DOWNSTREAM(FEET) =   1969.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.32   CHANNEL SLOPE =  0.0834
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.10
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.455
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      278.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     525.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.37
  AVERAGE FLOW DEPTH(FEET) =   2.92   TRAVEL TIME(MIN.) =   4.11
  Tc(MIN.) =   17.94
  SUBAREA AREA(ACRES) =   278.21       SUBAREA RUNOFF(CFS) =  539.61
  EFFECTIVE AREA(ACRES) =    382.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      382.4         PEAK FLOW RATE(CFS) =     741.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.49   FLOW VELOCITY(FEET/SEC.) =  12.51
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10505.00 =    6839.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10505.00 TO NODE  10506.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1969.00  DOWNSTREAM(FEET) =   1759.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.99   CHANNEL SLOPE =  0.0725
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.32
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.132
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      323.47      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1009.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.92
  AVERAGE FLOW DEPTH(FEET) =   4.23   TRAVEL TIME(MIN.) =   3.73
  Tc(MIN.) =   21.67
  SUBAREA AREA(ACRES) =   323.47       SUBAREA RUNOFF(CFS) =  533.45
  EFFECTIVE AREA(ACRES) =    705.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      705.9         PEAK FLOW RATE(CFS) =    1164.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.54   FLOW VELOCITY(FEET/SEC.) =  13.43
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10506.00 =    9732.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1759.23  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2597.28   CHANNEL SLOPE =  0.0273
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.17
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.869
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.34      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1314.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.67
  AVERAGE FLOW DEPTH(FEET) =   6.11   TRAVEL TIME(MIN.) =   4.48
  Tc(MIN.) =   26.15
  SUBAREA AREA(ACRES) =   212.34       SUBAREA RUNOFF(CFS) =  299.88
  EFFECTIVE AREA(ACRES) =    918.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      918.2         PEAK FLOW RATE(CFS) =    1296.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.07   FLOW VELOCITY(FEET/SEC.) =   9.65
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      918.2  TC(MIN.) =     26.15
  EFFECTIVE AREA(ACRES) =    918.23  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    1296.95
============================================================================
```



```
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S6.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.811
   2)   10.00;  3.713
   3)   15.00;  2.746
   4)   20.00;  2.218
   5)   25.00;  1.917
   6)   30.00;  1.656
   7)   40.00;  1.465
   8)   50.00;  1.306
   9)   60.00;  1.193
  10)   90.00;  1.032
  11)  120.00;  0.930
  12)  180.00;  0.798
  13)  360.00;  0.618
  14) 1440.00;  0.280
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10600.00 TO NODE  10601.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   312.13
  ELEVATION DATA: UPSTREAM(FEET) =   3250.51  DOWNSTREAM(FEET) =   3126.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.451
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.363
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.47      0.30     1.000      0    8.45
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.03
  TOTAL AREA(ACRES) =      2.47   PEAK FLOW RATE(CFS) =      9.03

**************************************************************************
  FLOW PROCESS FROM NODE  10601.00 TO NODE  10602.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3126.78  DOWNSTREAM(FEET) =   2951.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.40   CHANNEL SLOPE =  0.2828
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.667
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.58      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.78
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   1.79
  Tc(MIN.) =   10.24
  SUBAREA AREA(ACRES) =     6.58       SUBAREA RUNOFF(CFS) =   19.94
  EFFECTIVE AREA(ACRES) =      9.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =      27.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   6.59
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10602.00 =     932.53 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10602.00 TO NODE  10603.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2951.30  DOWNSTREAM(FEET) =   2641.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1930.18   CHANNEL SLOPE =  0.1606
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.08
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.949
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     100.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.67
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   3.71
  Tc(MIN.) =   13.95
  SUBAREA AREA(ACRES) =    60.78       SUBAREA RUNOFF(CFS) =  144.91
  EFFECTIVE AREA(ACRES) =     69.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.8         PEAK FLOW RATE(CFS) =     166.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =  10.17
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10603.00 =    2862.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10603.00 TO NODE  10604.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2641.28  DOWNSTREAM(FEET) =   2318.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.90   CHANNEL SLOPE =  0.1640
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.62
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.554
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     236.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.42
  AVERAGE FLOW DEPTH(FEET) =   1.57   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   16.82
  SUBAREA AREA(ACRES) =    68.78       SUBAREA RUNOFF(CFS) =  139.51
  EFFECTIVE AREA(ACRES) =    138.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      138.6         PEAK FLOW RATE(CFS) =     281.14
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.73   FLOW VELOCITY(FEET/SEC.) =  12.03
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10604.00 =    4829.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10604.00 TO NODE  10605.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2318.61  DOWNSTREAM(FEET) =   1983.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2601.81   CHANNEL SLOPE =  0.1286
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.202
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      178.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     433.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.58
  AVERAGE FLOW DEPTH(FEET) =   2.35   TRAVEL TIME(MIN.) =   3.45
  Tc(MIN.) =   20.27
  SUBAREA AREA(ACRES) =   178.16       SUBAREA RUNOFF(CFS) =  304.96
  EFFECTIVE AREA(ACRES) =    316.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      316.8         PEAK FLOW RATE(CFS) =     542.22
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.64   FLOW VELOCITY(FEET/SEC.) =  13.41
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10605.00 =    7431.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1983.94  DOWNSTREAM(FEET) =   1655.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2439.06   CHANNEL SLOPE =  0.1348
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.74
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.026
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.31      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     589.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.95
  AVERAGE FLOW DEPTH(FEET) =   2.73   TRAVEL TIME(MIN.) =   2.91
  Tc(MIN.) =   23.18
  SUBAREA AREA(ACRES) =    61.31       SUBAREA RUNOFF(CFS) =   95.26
  EFFECTIVE AREA(ACRES) =    378.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      378.1          PEAK FLOW RATE(CFS) =     587.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.73   FLOW VELOCITY(FEET/SEC.) =  13.94
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S4.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     6268.49   32.62  0.30( 0.30) 1.00    5008.0   10410.00
      2     6885.77   43.85  0.30( 0.30) 1.00    6528.2   10400.00
      3     6939.99   46.33  0.30( 0.30) 1.00    6816.7   10200.00
      4     6944.30   52.20  0.30( 0.30) 1.00    7411.0   10300.00
      5     6942.04   52.29  0.30( 0.30) 1.00    7417.2   10320.00
      6     6747.15   56.57  0.30( 0.30) 1.00    7600.9   10210.00
      7     6054.41   82.56  0.30( 0.30) 1.00    8308.0   10100.00
    TOTAL AREA(ACRES) =     8308.0

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S5.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1296.95   26.15  0.30( 0.30) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =      918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
```



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============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1296.95   26.15  0.30( 0.30) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =      918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1296.95   26.15    1.857  0.30( 0.30) 1.00     918.2   10500.00
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6268.49   32.62    1.606  0.30( 0.30) 1.00    5008.0   10410.00
      2     6885.77   43.85    1.404  0.30( 0.30) 1.00    6528.2   10400.00
      3     6939.99   46.33    1.364  0.30( 0.30) 1.00    6816.7   10200.00
      4     6944.30   52.20    1.281  0.30( 0.30) 1.00    7411.0   10300.00
      5     6942.04   52.29    1.280  0.30( 0.30) 1.00    7417.2   10320.00
      6     6747.15   56.57    1.232  0.30( 0.30) 1.00    7600.9   10210.00
      7     6054.41   82.56    1.072  0.30( 0.30) 1.00    8308.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7287.67   26.15    1.857  0.30( 0.30) 1.00    4932.9   10500.00
      2     7356.35   32.62    1.606  0.30( 0.30) 1.00    5926.3   10410.00
      3     7805.20   43.85    1.404  0.30( 0.30) 1.00    7446.4   10400.00
      4     7826.69   46.33    1.364  0.30( 0.30) 1.00    7734.9   10200.00
      5     7761.65   52.20    1.281  0.30( 0.30) 1.00    8329.2   10300.00
      6     7758.53   52.29    1.280  0.30( 0.30) 1.00    8335.4   10320.00
      7     7523.32   56.57    1.232  0.30( 0.30) 1.00    8519.1   10210.00
      8     6697.50   82.56    1.072  0.30( 0.30) 1.00    9226.2   10100.00
    TOTAL AREA(ACRES) =      9226.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     7826.69  Tc(MIN.) =   46.325
  EFFECTIVE AREA(ACRES) =   7734.92  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     9226.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10507.00 TO NODE  10620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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 ELEVATION DATA: UPSTREAM(FEET) =   1688.35  DOWNSTREAM(FEET) =   1655.24
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2570.61   CHANNEL SLOPE =  0.0129
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.56
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.302
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       83.74      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7864.44
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.53
 AVERAGE FLOW DEPTH(FEET) =  11.55   TRAVEL TIME(MIN.) =   4.07
 Tc(MIN.) =   50.40
 SUBAREA AREA(ACRES) =    83.74       SUBAREA RUNOFF(CFS) =   75.49
 EFFECTIVE AREA(ACRES) =   7818.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     9310.0         PEAK FLOW RATE(CFS) =    7826.69
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.53

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 11.53   FLOW VELOCITY(FEET/SEC.) =  10.52
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     7287.67   30.29    1.650  0.30( 0.30) 1.00    5016.6   10500.00
     2     7356.35   36.75    1.527  0.30( 0.30) 1.00    6010.0   10410.00
     3     7805.20   47.93    1.339  0.30( 0.30) 1.00    7530.2   10400.00
     4     7826.69   50.40    1.302  0.30( 0.30) 1.00    7818.7   10200.00
     5     7761.65   56.28    1.235  0.30( 0.30) 1.00    8412.9   10300.00
     6     7758.53   56.37    1.234  0.30( 0.30) 1.00    8419.2   10320.00
     7     7523.32   60.69    1.189  0.30( 0.30) 1.00    8602.8   10210.00
     8     6697.50   86.80    1.049  0.30( 0.30) 1.00    9310.0   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      587.46   23.18    2.026  0.30( 0.30) 1.00     378.1   10600.00
 LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     7716.99   23.18    2.026  0.30( 0.30) 1.00    4217.3   10600.00
```



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     2     7747.20   30.29    1.650  0.30( 0.30) 1.00    5394.7   10500.00
     3     7773.89   36.75    1.527  0.30( 0.30) 1.00    6388.1   10410.00
     4     8158.76   47.93    1.339  0.30( 0.30) 1.00    7908.2   10400.00
     5     8167.51   50.40    1.302  0.30( 0.30) 1.00    8196.7   10200.00
     6     8079.84   56.28    1.235  0.30( 0.30) 1.00    8791.0   10300.00
     7     8076.38   56.37    1.234  0.30( 0.30) 1.00    8797.2   10320.00
     8     7825.95   60.69    1.189  0.30( 0.30) 1.00    8980.9   10210.00
     9     6952.45   86.80    1.049  0.30( 0.30) 1.00    9688.1   10100.00
   TOTAL AREA(ACRES) =      9688.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     8167.51  Tc(MIN.) =   50.395
 EFFECTIVE AREA(ACRES) =   8196.74  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     9688.1
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10620.00 TO NODE  10621.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1655.24  DOWNSTREAM(FEET) =   1584.84
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2294.47   CHANNEL SLOPE =  0.0307
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.63
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.272
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      342.43      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    8317.32
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.69
 AVERAGE FLOW DEPTH(FEET) =   9.62   TRAVEL TIME(MIN.) =   2.60
 Tc(MIN.) =   53.00
 SUBAREA AREA(ACRES) =   342.43       SUBAREA RUNOFF(CFS) =  299.62
 EFFECTIVE AREA(ACRES) =   8539.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    10030.5         PEAK FLOW RATE(CFS) =    8167.51
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.53

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.53   FLOW VELOCITY(FEET/SEC.) =  14.62
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10621.00 =   40157.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1584.84  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2923.79   CHANNEL SLOPE =  0.0482
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.56
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.240
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      160.90      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    8235.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.29
  AVERAGE FLOW DEPTH(FEET) =   8.56   TRAVEL TIME(MIN.) =   2.82
  Tc(MIN.) =   55.82
  SUBAREA AREA(ACRES) =   160.90       SUBAREA RUNOFF(CFS) =  136.17
  EFFECTIVE AREA(ACRES) =   8700.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10191.4         PEAK FLOW RATE(CFS) =    8167.51
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.52   FLOW VELOCITY(FEET/SEC.) =  17.24
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   55.82
  RAINFALL INTENSITY(INCH/HR) =   1.24
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    8700.07
  TOTAL STREAM AREA(ACRES) =   10191.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    8167.51

****************************************************************************
  FLOW PROCESS FROM NODE  10630.00 TO NODE  10631.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.79
  ELEVATION DATA: UPSTREAM(FEET) =   3257.00  DOWNSTREAM(FEET) =   3147.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.430
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.372
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.25      0.30     1.000     0    8.43
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.58
  TOTAL AREA(ACRES) =      1.25   PEAK FLOW RATE(CFS) =      4.58

****************************************************************************
  FLOW PROCESS FROM NODE  10631.00 TO NODE  10632.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3147.13  DOWNSTREAM(FEET) =   2774.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   640.96   CHANNEL SLOPE =  0.5817
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.20
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.676
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.75      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.06
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   1.76
  Tc(MIN.) =   10.19
  SUBAREA AREA(ACRES) =     4.75       SUBAREA RUNOFF(CFS) =   14.43
  EFFECTIVE AREA(ACRES) =      6.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      18.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   7.03
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10632.00 =     939.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10632.00 TO NODE  10633.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2774.29  DOWNSTREAM(FEET) =   2004.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.65   CHANNEL SLOPE =  0.4039
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.186
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED                -       79.75      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     122.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.55
  AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =   2.53
  Tc(MIN.) =   12.72
  SUBAREA AREA(ACRES) =    79.75       SUBAREA RUNOFF(CFS) =  207.18
  EFFECTIVE AREA(ACRES) =     85.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       85.8          PEAK FLOW RATE(CFS) =     222.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.18   FLOW VELOCITY(FEET/SEC.) =  15.28
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10633.00 =    2845.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10633.00 TO NODE  10634.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.58  DOWNSTREAM(FEET) =   1714.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1868.05   CHANNEL SLOPE =  0.1550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.727
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      124.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     359.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.68
  AVERAGE FLOW DEPTH(FEET) =   2.02   TRAVEL TIME(MIN.) =   2.45
  Tc(MIN.) =   15.18
  SUBAREA AREA(ACRES) =   124.45       SUBAREA RUNOFF(CFS) =  271.87
  EFFECTIVE AREA(ACRES) =    210.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      210.2         PEAK FLOW RATE(CFS) =     459.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.30   FLOW VELOCITY(FEET/SEC.) =  13.67
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10634.00 =    4713.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1714.99  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.34   CHANNEL SLOPE =  0.1609
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.40
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.518
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       42.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     501.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.18
  AVERAGE FLOW DEPTH(FEET) =   2.39   TRAVEL TIME(MIN.) =   1.98
  Tc(MIN.) =   17.16
  SUBAREA AREA(ACRES) =    42.00       SUBAREA RUNOFF(CFS) =   83.85
  EFFECTIVE AREA(ACRES) =    252.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.2         PEAK FLOW RATE(CFS) =     503.47
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.39   FLOW VELOCITY(FEET/SEC.) =  14.23
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10640.00 =    6398.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.16
  RAINFALL INTENSITY(INCH/HR) =   2.52
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     252.20
  TOTAL STREAM AREA(ACRES) =     252.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     503.47

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7716.99   28.68    1.725  0.30( 0.30) 1.00    4720.6   10600.00
      1     7747.20   35.78    1.546  0.30( 0.30) 1.00    5898.0   10500.00
      1     7773.89   42.24    1.429  0.30( 0.30) 1.00    6891.4   10410.00
      1     8158.76   53.35    1.268  0.30( 0.30) 1.00    8411.6   10400.00
      1     8167.51   55.82    1.240  0.30( 0.30) 1.00    8700.1   10200.00
      1     8079.84   61.72    1.184  0.30( 0.30) 1.00    9294.4   10300.00
      1     8076.38   61.81    1.183  0.30( 0.30) 1.00    9300.6   10320.00
      1     7825.95   66.17    1.160  0.30( 0.30) 1.00    9484.2   10210.00
      1     6952.45   92.47    1.024  0.30( 0.30) 1.00   10191.4   10100.00
```

```
    2      503.47   17.16    2.518  0.30( 0.30) 1.00     252.2   10630.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7689.54   17.16    2.518  0.30( 0.30) 1.00    3076.8   10630.00
      2     8040.47   28.68    1.725  0.30( 0.30) 1.00    4972.8   10600.00
      3     8029.92   35.78    1.546  0.30( 0.30) 1.00    6150.2   10500.00
      4     8030.25   42.24    1.429  0.30( 0.30) 1.00    7143.6   10410.00
      5     8378.53   53.35    1.268  0.30( 0.30) 1.00    8663.8   10400.00
      6     8380.95   55.82    1.240  0.30( 0.30) 1.00    8952.3   10200.00
      7     8280.45   61.72    1.184  0.30( 0.30) 1.00    9546.6   10300.00
      8     8276.88   61.81    1.183  0.30( 0.30) 1.00    9552.8   10320.00
      9     8021.14   66.17    1.160  0.30( 0.30) 1.00    9736.4   10210.00
     10     7116.71   92.47    1.024  0.30( 0.30) 1.00   10443.6   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    8380.95    Tc(MIN.) =    55.82
  EFFECTIVE AREA(ACRES) =    8952.27   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    10443.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1443.87  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2254.45   CHANNEL SLOPE =  0.0548
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.38
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.217
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    8419.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.22
  AVERAGE FLOW DEPTH(FEET) =   8.38   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =   57.88
  SUBAREA AREA(ACRES) =    94.37       SUBAREA RUNOFF(CFS) =   77.89
  EFFECTIVE AREA(ACRES) =   9046.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10538.0         PEAK FLOW RATE(CFS) =    8380.95
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) =  8.36   FLOW VELOCITY(FEET/SEC.) =  18.19
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    10538.0  TC(MIN.) =     57.88
  EFFECTIVE AREA(ACRES) =   9046.64  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    8380.95

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7689.54   19.27    2.295  0.30( 0.30) 1.00    3171.1   10630.00
      2     8040.47   30.76    1.641  0.30( 0.30) 1.00    5067.2   10600.00
      3     8029.92   37.87    1.506  0.30( 0.30) 1.00    6244.6   10500.00
      4     8030.25   44.33    1.396  0.30( 0.30) 1.00    7238.0   10410.00
      5     8378.53   55.41    1.245  0.30( 0.30) 1.00    8758.1   10400.00
      6     8380.95   57.88    1.217  0.30( 0.30) 1.00    9046.6   10200.00
      7     8280.45   63.79    1.173  0.30( 0.30) 1.00    9640.9   10300.00
      8     8276.88   63.88    1.172  0.30( 0.30) 1.00    9647.1   10320.00
      9     8021.14   68.26    1.149  0.30( 0.30) 1.00    9830.8   10210.00
     10     7116.71   94.63    1.016  0.30( 0.30) 1.00   10538.0   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S7.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.811
   2)   10.00;  3.713
   3)   15.00;  2.746
   4)   20.00;  2.218
   5)   25.00;  1.917
   6)   30.00;  1.656
   7)   40.00;  1.465
   8)   50.00;  1.306
   9)   60.00;  1.193
  10)   90.00;  1.032
  11)  120.00;  0.930
  12)  180.00;  0.798
  13)  360.00;  0.618
  14) 1440.00;  0.280
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10700.00 TO NODE  10701.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   281.18
  ELEVATION DATA: UPSTREAM(FEET) =   3512.68  DOWNSTREAM(FEET) =   3444.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.938
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.159
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.30      0.30     1.000      0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.51
  TOTAL AREA(ACRES) =      1.30   PEAK FLOW RATE(CFS) =      4.51

**************************************************************************
  FLOW PROCESS FROM NODE  10701.00 TO NODE  10702.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3444.33  DOWNSTREAM(FEET) =   3246.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   700.05   CHANNEL SLOPE =  0.2823
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.479
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.49      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.14
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   11.21
  SUBAREA AREA(ACRES) =     6.49       SUBAREA RUNOFF(CFS) =   18.57
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8          PEAK FLOW RATE(CFS) =      22.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   6.13
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10702.00 =     981.23 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10702.00 TO NODE  10703.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3246.68  DOWNSTREAM(FEET) =   3075.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1893.56   CHANNEL SLOPE =  0.0906
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.92
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.575
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.98      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.83
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   5.41
  Tc(MIN.) =   16.62
  SUBAREA AREA(ACRES) =    31.98       SUBAREA RUNOFF(CFS) =   65.47
  EFFECTIVE AREA(ACRES) =     39.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       39.8         PEAK FLOW RATE(CFS) =      81.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.02   FLOW VELOCITY(FEET/SEC.) =   6.65
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.00 =    2874.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.00 TO NODE  10703.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3075.14  DOWNSTREAM(FEET) =   2952.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2060.61   CHANNEL SLOPE =  0.0597
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.41
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.096
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.58      0.30     0.872     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.872
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     110.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.36
  AVERAGE FLOW DEPTH(FEET) =   1.36   TRAVEL TIME(MIN.) =   5.40
  Tc(MIN.) =   22.02
  SUBAREA AREA(ACRES) =    34.58       SUBAREA RUNOFF(CFS) =   57.10
  EFFECTIVE AREA(ACRES) =     74.35     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       74.4         PEAK FLOW RATE(CFS) =     121.39
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.44   FLOW VELOCITY(FEET/SEC.) =   6.56
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.50 =    4935.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.50 TO NODE  10704.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2952.03  DOWNSTREAM(FEET) =   2895.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.70   CHANNEL SLOPE =  0.0606
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.962
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.69      0.30     0.951     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     144.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.94
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   24.26
  SUBAREA AREA(ACRES) =    30.69       SUBAREA RUNOFF(CFS) =   46.30
  EFFECTIVE AREA(ACRES) =    105.04     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      105.0         PEAK FLOW RATE(CFS) =     158.69
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.67   FLOW VELOCITY(FEET/SEC.) =   7.14
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10704.00 =    5866.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2895.59  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2585.44   CHANNEL SLOPE =  0.1217
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.99
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.751
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.40      0.30     0.977     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     289.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.96
  AVERAGE FLOW DEPTH(FEET) =   1.91   TRAVEL TIME(MIN.) =   3.93
  Tc(MIN.) =   28.19
  SUBAREA AREA(ACRES) =   199.40       SUBAREA RUNOFF(CFS) =  261.56
  EFFECTIVE AREA(ACRES) =    304.44     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      304.4          PEAK FLOW RATE(CFS) =     400.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.28   FLOW VELOCITY(FEET/SEC.) =  12.03
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.19
  RAINFALL INTENSITY(INCH/HR) =   1.75
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     304.44
  TOTAL STREAM AREA(ACRES) =     304.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     400.30

****************************************************************************
  FLOW PROCESS FROM NODE  10710.00 TO NODE  10711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.64
  ELEVATION DATA: UPSTREAM(FEET) =   3389.13  DOWNSTREAM(FEET) =   3276.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.438
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.435
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK               -        7.76      0.30     0.981     0   11.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.981
  SUBAREA RUNOFF(CFS) =     21.93
  TOTAL AREA(ACRES) =      7.76   PEAK FLOW RATE(CFS) =     21.93

****************************************************************************
  FLOW PROCESS FROM NODE  10711.00 TO NODE  10712.00 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3276.30  DOWNSTREAM(FEET) =   3152.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   950.69   CHANNEL SLOPE =  0.1305
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.72
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.948
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       22.39      0.30     0.988     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.988
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.30
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   2.52
  Tc(MIN.) =   13.95
  SUBAREA AREA(ACRES) =    22.39       SUBAREA RUNOFF(CFS) =   53.44
  EFFECTIVE AREA(ACRES) =     30.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       30.1          PEAK FLOW RATE(CFS) =      71.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   7.22
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10712.00 =    1894.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10712.00 TO NODE  10713.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3152.26  DOWNSTREAM(FEET) =   2879.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.77   CHANNEL SLOPE =  0.1431
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.468
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       42.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     113.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.65
  AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   3.68
  Tc(MIN.) =   17.63
  SUBAREA AREA(ACRES) =    42.59       SUBAREA RUNOFF(CFS) =   83.11
  EFFECTIVE AREA(ACRES) =     72.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       72.7          PEAK FLOW RATE(CFS) =     142.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   9.31
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10713.00 =    3804.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.03  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2621.96   CHANNEL SLOPE =  0.1136
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.97
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.110
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      156.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     270.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.48
  AVERAGE FLOW DEPTH(FEET) =   1.87   TRAVEL TIME(MIN.) =   4.17
  Tc(MIN.) =   21.80
  SUBAREA AREA(ACRES) =   156.72       SUBAREA RUNOFF(CFS) =  255.25
  EFFECTIVE AREA(ACRES) =    229.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      229.5         PEAK FLOW RATE(CFS) =     373.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.24   FLOW VELOCITY(FEET/SEC.) =  11.52
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10720.00 =    6426.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.80
  RAINFALL INTENSITY(INCH/HR) =   2.11
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     229.46
  TOTAL STREAM AREA(ACRES) =     229.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     373.84
```



```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      400.30   28.19    1.751  0.30( 0.29) 0.97     304.4   10700.00
      2      373.84   21.80    2.110  0.30( 0.30) 1.00     229.5   10710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      759.51   21.80    2.110  0.30( 0.29) 0.98     464.9   10710.00
      2      699.98   28.19    1.751  0.30( 0.29) 0.98     533.9   10700.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     759.51    Tc(MIN.) =    21.80
  EFFECTIVE AREA(ACRES) =     464.90   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =      533.9
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.00 TO NODE  10720.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.07  DOWNSTREAM(FEET) =   2523.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.13   CHANNEL SLOPE =  0.0339
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.927
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     844.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.32
  AVERAGE FLOW DEPTH(FEET) =   4.68   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   24.84
  SUBAREA AREA(ACRES) =   116.31       SUBAREA RUNOFF(CFS) =  170.30
  EFFECTIVE AREA(ACRES) =    581.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      650.2         PEAK FLOW RATE(CFS) =     853.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.70   FLOW VELOCITY(FEET/SEC.) =   9.35
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.50 =   10150.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.50 TO NODE  10721.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2523.48  DOWNSTREAM(FEET) =   2488.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1575.08   CHANNEL SLOPE =  0.0221
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.40
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.757
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     907.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.13
  AVERAGE FLOW DEPTH(FEET) =   5.38   TRAVEL TIME(MIN.) =   3.23
  Tc(MIN.) =   28.07
  SUBAREA AREA(ACRES) =    82.28       SUBAREA RUNOFF(CFS) =  107.90
  EFFECTIVE AREA(ACRES) =    663.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      732.5         PEAK FLOW RATE(CFS) =     872.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.28   FLOW VELOCITY(FEET/SEC.) =   8.04
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.00 =   11725.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.00 TO NODE  10721.50 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2488.66  DOWNSTREAM(FEET) =   2453.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2032.11   CHANNEL SLOPE =  0.0174
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.09
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.609
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      259.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1025.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.68
  AVERAGE FLOW DEPTH(FEET) =   6.05   TRAVEL TIME(MIN.) =   4.41
  Tc(MIN.) =   32.48
  SUBAREA AREA(ACRES) =   259.52       SUBAREA RUNOFF(CFS) =  305.68
  EFFECTIVE AREA(ACRES) =    923.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      992.0         PEAK FLOW RATE(CFS) =    1089.51
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.22   FLOW VELOCITY(FEET/SEC.) =   7.80
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.50 =   13757.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.50 TO NODE  10722.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.35  DOWNSTREAM(FEET) =   2384.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1842.37   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.48
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.554
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      229.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1219.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.66
  AVERAGE FLOW DEPTH(FEET) =   5.47   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   35.36
  SUBAREA AREA(ACRES) =   229.78       SUBAREA RUNOFF(CFS) =  259.27
  EFFECTIVE AREA(ACRES) =   1152.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1221.8         PEAK FLOW RATE(CFS) =    1303.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.64   FLOW VELOCITY(FEET/SEC.) =  10.85
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10722.00 =   15600.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10722.00 TO NODE  10723.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2384.52  DOWNSTREAM(FEET) =   1925.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3780.37   CHANNEL SLOPE =  0.1214
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.50
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.484
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      308.58      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1467.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.26
  AVERAGE FLOW DEPTH(FEET) =   4.48   TRAVEL TIME(MIN.) =   3.65
  Tc(MIN.) =   39.01
  SUBAREA AREA(ACRES) =   308.58       SUBAREA RUNOFF(CFS) =  328.82
  EFFECTIVE AREA(ACRES) =   1461.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1530.4          PEAK FLOW RATE(CFS) =    1559.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.62   FLOW VELOCITY(FEET/SEC.) =  17.54
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10723.00 =   19380.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1925.64  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3826.73   CHANNEL SLOPE =  0.1582
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.63
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.430
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      434.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1780.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.03
  AVERAGE FLOW DEPTH(FEET) =   4.62   TRAVEL TIME(MIN.) =   3.18
  Tc(MIN.) =   42.19
  SUBAREA AREA(ACRES) =   434.11       SUBAREA RUNOFF(CFS) =  441.56
  EFFECTIVE AREA(ACRES) =   1895.48     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1964.5          PEAK FLOW RATE(CFS) =    1930.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.81   FLOW VELOCITY(FEET/SEC.) =  20.46
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     1964.5  TC(MIN.) =     42.19
  EFFECTIVE AREA(ACRES) =   1895.48  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.995
  PEAK FLOW RATE(CFS)   =    1930.33
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     1930.33   42.19    1.430  0.30( 0.30) 1.00    1895.5   10710.00
      2     1812.38   48.91    1.323  0.30( 0.30) 0.99    1964.5   10700.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S8.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.650
   2)   10.00;  3.621
   3)   15.00;  2.692
   4)   20.00;  2.182
   5)   25.00;  1.889
   6)   30.00;  1.636
   7)   40.00;  1.443
   8)   50.00;  1.285
   9)   60.00;  1.171
  10)   90.00;  1.008
  11)  120.00;  0.905
  12)  180.00;  0.773
  13)  360.00;  0.594
  14) 1440.00;  0.268
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10800.00 TO NODE  10801.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.93
  ELEVATION DATA: UPSTREAM(FEET) =   2617.19  DOWNSTREAM(FEET) =   2506.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.540
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.619
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.83      0.30     1.000     0    7.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.23
  TOTAL AREA(ACRES) =      0.83   PEAK FLOW RATE(CFS) =      3.23

**************************************************************************
  FLOW PROCESS FROM NODE  10801.00 TO NODE  10802.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2506.15  DOWNSTREAM(FEET) =   2237.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.01   CHANNEL SLOPE =  0.3968
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.23
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.758
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.32
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   2.12
  Tc(MIN.) =    9.66
  SUBAREA AREA(ACRES) =     5.30       SUBAREA RUNOFF(CFS) =   16.50
  EFFECTIVE AREA(ACRES) =      6.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =      19.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   6.47
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10802.00 =     925.94 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10802.00 TO NODE  10803.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2237.54  DOWNSTREAM(FEET) =   1920.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =   954.74   CHANNEL SLOPE =  0.3325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.51
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.326
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.26
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   11.59
  SUBAREA AREA(ACRES) =    18.25       SUBAREA RUNOFF(CFS) =   49.71
  EFFECTIVE AREA(ACRES) =     24.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.4         PEAK FLOW RATE(CFS) =      66.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   9.51
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10803.00 =    1880.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1920.11  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2201.18   CHANNEL SLOPE =  0.2865
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.761
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.99      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.07
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   14.63
  SUBAREA AREA(ACRES) =    78.99       SUBAREA RUNOFF(CFS) =  174.98
  EFFECTIVE AREA(ACRES) =    103.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      103.4         PEAK FLOW RATE(CFS) =     228.99
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =  13.69
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S6.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     7689.54   19.27  0.30( 0.30) 1.00    3171.1   10630.00
      2     8040.47   30.76  0.30( 0.30) 1.00    5067.2   10600.00
      3     8029.92   37.87  0.30( 0.30) 1.00    6244.6   10500.00
      4     8030.25   44.33  0.30( 0.30) 1.00    7238.0   10410.00
      5     8378.53   55.41  0.30( 0.30) 1.00    8758.1   10400.00
      6     8380.95   57.88  0.30( 0.30) 1.00    9046.6   10200.00
      7     8280.45   63.79  0.30( 0.30) 1.00    9640.9   10300.00
      8     8276.88   63.88  0.30( 0.30) 1.00    9647.1   10320.00
      9     8021.14   68.26  0.30( 0.30) 1.00    9830.8   10210.00
     10     7116.71   94.63  0.30( 0.30) 1.00   10538.0   10100.00
    TOTAL AREA(ACRES) =    10538.0

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S7.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1930.33   42.19  0.30( 0.30) 1.00    1895.5   10710.00
      2     1812.38   48.91  0.30( 0.30) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =     1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1930.33   42.19  0.30( 0.30) 1.00    1895.5   10710.00
```

```
      2     1812.38   48.91  0.30( 0.30) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =      1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1930.33   42.19    1.408  0.30( 0.30) 1.00    1895.5   10710.00
      2     1812.38   48.91    1.302  0.30( 0.30) 0.99    1964.5   10700.00
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7689.54   19.27    2.257  0.30( 0.30) 1.00    3171.1   10630.00
      2     8040.47   30.76    1.621  0.30( 0.30) 1.00    5067.2   10600.00
      3     8029.92   37.87    1.484  0.30( 0.30) 1.00    6244.6   10500.00
      4     8030.25   44.33    1.375  0.30( 0.30) 1.00    7238.0   10410.00
      5     8378.53   55.41    1.223  0.30( 0.30) 1.00    8758.1   10400.00
      6     8380.95   57.88    1.195  0.30( 0.30) 1.00    9046.6   10200.00
      7     8280.45   63.79    1.150  0.30( 0.30) 1.00    9640.9   10300.00
      8     8276.88   63.88    1.150  0.30( 0.30) 1.00    9647.1   10320.00
      9     8021.14   68.26    1.126  0.30( 0.30) 1.00    9830.8   10210.00
     10     7116.71   94.63    0.992  0.30( 0.30) 1.00   10538.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9244.87   19.27    2.257  0.30( 0.30) 1.00    4036.6   10630.00
      2     9717.84   30.76    1.621  0.30( 0.30) 1.00    6449.1   10600.00
      3     9880.74   37.87    1.484  0.30( 0.30) 1.00    7945.9   10500.00
      4     9960.47   42.19    1.408  0.30( 0.30) 1.00    8804.9   10710.00
      5     9923.06   44.33    1.375  0.30( 0.30) 1.00    9155.4   10410.00
      6     9986.54   48.91    1.302  0.30( 0.30) 1.00    9830.6   10700.00
      7    10048.42   55.41    1.223  0.30( 0.30) 1.00   10722.6   10400.00
      8    10000.06   57.88    1.195  0.30( 0.30) 1.00   11011.1   10200.00
      9     9818.78   63.79    1.150  0.30( 0.30) 1.00   11605.4   10300.00
     10     9814.31   63.88    1.150  0.30( 0.30) 1.00   11611.6   10320.00
     11     9515.61   68.26    1.126  0.30( 0.30) 1.00   11795.3   10210.00
     12     8369.26   94.63    0.992  0.30( 0.30) 1.00   12502.4   10100.00
    TOTAL AREA(ACRES) =     12502.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    10048.42  Tc(MIN.) =   55.412
  EFFECTIVE AREA(ACRES) =  10722.62  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12502.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10724.00 TO NODE  10820.00 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1320.32  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1341.06   CHANNEL SLOPE =  0.0231
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.31
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.205
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   10067.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.92
  AVERAGE FLOW DEPTH(FEET) =  11.31   TRAVEL TIME(MIN.) =   1.61
  Tc(MIN.) =   57.02
  SUBAREA AREA(ACRES) =    47.66       SUBAREA RUNOFF(CFS) =   38.82
  EFFECTIVE AREA(ACRES) =  10770.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12550.1          PEAK FLOW RATE(CFS) =   10048.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.30   FLOW VELOCITY(FEET/SEC.) =  13.92
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9244.87   20.91    2.129  0.30( 0.30) 1.00    4084.3   10630.00
      2     9717.84   32.38    1.590  0.30( 0.30) 1.00    6496.8   10600.00
      3     9880.74   39.48    1.453  0.30( 0.30) 1.00    7993.5   10500.00
      4     9960.47   43.80    1.383  0.30( 0.30) 1.00    8852.6   10710.00
      5     9923.06   45.94    1.349  0.30( 0.30) 1.00    9203.1   10410.00
      6     9986.54   50.52    1.279  0.30( 0.30) 1.00    9878.2   10700.00
      7    10048.42   57.02    1.205  0.30( 0.30) 1.00   10770.3   10400.00
      8    10000.06   59.49    1.177  0.30( 0.30) 1.00   11058.8   10200.00
      9     9818.78   65.40    1.142  0.30( 0.30) 1.00   11653.1   10300.00
     10     9814.31   65.49    1.141  0.30( 0.30) 1.00   11659.3   10320.00
     11     9515.61   69.89    1.117  0.30( 0.30) 1.00   11842.9   10210.00
     12     8369.26   96.31    0.986  0.30( 0.30) 1.00   12550.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
      1      228.99   14.63    2.761  0.30( 0.30) 1.00     103.4   10800.00
 LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     8933.00   14.63    2.761  0.30( 0.30) 1.00    2960.9   10800.00
     2     9415.02   20.91    2.129  0.30( 0.30) 1.00    4187.7   10630.00
     3     9837.87   32.38    1.590  0.30( 0.30) 1.00    6600.1   10600.00
     4     9988.01   39.48    1.453  0.30( 0.30) 1.00    8096.9   10500.00
     5    10061.22   43.80    1.383  0.30( 0.30) 1.00    8956.0   10710.00
     6    10020.67   45.94    1.349  0.30( 0.30) 1.00    9306.5   10410.00
     7    10077.63   50.52    1.279  0.30( 0.30) 1.00    9981.6   10700.00
     8    10132.62   57.02    1.205  0.30( 0.30) 1.00   10873.7   10400.00
     9    10081.65   59.49    1.177  0.30( 0.30) 1.00   11162.1   10200.00
    10     9897.08   65.40    1.142  0.30( 0.30) 1.00   11756.4   10300.00
    11     9892.57   65.49    1.141  0.30( 0.30) 1.00   11762.6   10320.00
    12     9591.65   69.89    1.117  0.30( 0.30) 1.00   11946.3   10210.00
    13     8433.12   96.31    0.986  0.30( 0.30) 1.00   12653.5   10100.00
   TOTAL AREA(ACRES) =     12653.5

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    10132.62  Tc(MIN.) =   57.017
 EFFECTIVE AREA(ACRES) =  10873.65  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =    12653.5
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1289.38  DOWNSTREAM(FEET) =   1208.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2450.84   CHANNEL SLOPE =  0.0332
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.43
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.176
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      147.19      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   10190.64
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.97
 AVERAGE FLOW DEPTH(FEET) =  10.42   TRAVEL TIME(MIN.) =   2.56
 Tc(MIN.) =   59.58
 SUBAREA AREA(ACRES) =   147.19       SUBAREA RUNOFF(CFS) =  116.03
 EFFECTIVE AREA(ACRES) =  11020.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    12800.7         PEAK FLOW RATE(CFS) =   10132.62
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.39
```



```
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.39   FLOW VELOCITY(FEET/SEC.) =  15.93
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   59.58
 RAINFALL INTENSITY(INCH/HR) =   1.18
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =   11020.84
 TOTAL STREAM AREA(ACRES) =   12800.66
 PEAK FLOW RATE(CFS) AT CONFLUENCE =   10132.62

****************************************************************************
 FLOW PROCESS FROM NODE  10830.00 TO NODE  10831.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.89
 ELEVATION DATA: UPSTREAM(FEET) =   3249.56  DOWNSTREAM(FEET) =   3166.67

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.939
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.052
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        0.88      0.30     1.000     0    8.94
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      2.97
 TOTAL AREA(ACRES) =      0.88   PEAK FLOW RATE(CFS) =      2.97

****************************************************************************
 FLOW PROCESS FROM NODE  10831.00 TO NODE  10832.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3166.67  DOWNSTREAM(FEET) =   2954.84
 CHANNEL LENGTH THRU SUBAREA(FEET) =   677.65   CHANNEL SLOPE =  0.3126
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.18
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.298
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED                -        2.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.04
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   11.74
  SUBAREA AREA(ACRES) =     2.82       SUBAREA RUNOFF(CFS) =    7.61
  EFFECTIVE AREA(ACRES) =      3.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =       9.99
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   4.72
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10832.00 =     977.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10832.00 TO NODE  10833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2954.84  DOWNSTREAM(FEET) =   2765.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.35   CHANNEL SLOPE =  0.1995
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.877
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       29.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.98
  AVERAGE FLOW DEPTH(FEET) =   0.57   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   14.01
  SUBAREA AREA(ACRES) =    29.25       SUBAREA RUNOFF(CFS) =   67.83
  EFFECTIVE AREA(ACRES) =     32.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      76.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   8.46
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10833.00 =    1928.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10833.00 TO NODE  10834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2765.08  DOWNSTREAM(FEET) =   2446.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.29   CHANNEL SLOPE =  0.1628
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.31
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.459
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       80.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     155.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.96
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   3.28
  Tc(MIN.) =   17.28
  SUBAREA AREA(ACRES) =    80.66       SUBAREA RUNOFF(CFS) =  156.74
  EFFECTIVE AREA(ACRES) =    113.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.6         PEAK FLOW RATE(CFS) =     220.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.52   FLOW VELOCITY(FEET/SEC.) =  11.13
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10834.00 =    3888.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10834.00 TO NODE  10835.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2446.09  DOWNSTREAM(FEET) =   1797.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2083.04   CHANNEL SLOPE =  0.3113
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.246
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      196.68      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     393.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.65
  AVERAGE FLOW DEPTH(FEET) =   1.75   TRAVEL TIME(MIN.) =   2.09
  Tc(MIN.) =   19.37
  SUBAREA AREA(ACRES) =   196.68       SUBAREA RUNOFF(CFS) =  344.55
  EFFECTIVE AREA(ACRES) =    310.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      310.3         PEAK FLOW RATE(CFS) =     543.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.09   FLOW VELOCITY(FEET/SEC.) =  18.37
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10835.00 =    5971.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1797.70  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3213.25   CHANNEL SLOPE =  0.1835
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.83
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.028
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      218.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     713.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.44
  AVERAGE FLOW DEPTH(FEET) =   2.79   TRAVEL TIME(MIN.) =   3.26
  Tc(MIN.) =   22.63
  SUBAREA AREA(ACRES) =   218.82       SUBAREA RUNOFF(CFS) =  340.35
  EFFECTIVE AREA(ACRES) =    529.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      529.1         PEAK FLOW RATE(CFS) =     822.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.00   FLOW VELOCITY(FEET/SEC.) =  17.12
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10840.00 =    9184.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.63
  RAINFALL INTENSITY(INCH/HR) =   2.03
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     529.11
  TOTAL STREAM AREA(ACRES) =     529.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     822.98

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     8933.00   17.27    2.461  0.30( 0.30) 1.00    3108.1   10800.00
      1     9415.02   23.51    1.976  0.30( 0.30) 1.00    4334.9   10630.00
      1     9837.87   34.96    1.540  0.30( 0.30) 1.00    6747.3   10600.00
      1     9988.01   42.05    1.411  0.30( 0.30) 1.00    8244.1   10500.00
      1    10061.22   46.36    1.342  0.30( 0.30) 1.00    9103.2   10710.00
      1    10020.67   48.51    1.309  0.30( 0.30) 1.00    9453.6   10410.00
      1    10077.63   53.08    1.250  0.30( 0.30) 1.00   10128.8   10700.00
      1    10132.62   59.58    1.176  0.30( 0.30) 1.00   11020.8   10400.00
      1    10081.65   62.05    1.160  0.30( 0.30) 1.00   11309.3   10200.00
      1     9897.08   67.98    1.128  0.30( 0.30) 1.00   11903.6   10300.00
      1     9892.57   68.07    1.127  0.30( 0.30) 1.00   11909.8   10320.00
      1     9591.65   72.48    1.103  0.30( 0.30) 1.00   12093.5   10210.00
      1     8433.12   99.00    0.977  0.30( 0.30) 1.00   12800.7   10100.00
      2      822.98   22.63    2.028  0.30( 0.30) 1.00     529.1   10830.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9718.29   17.27    2.461  0.30( 0.30) 1.00    3511.8   10800.00
      2    10169.61   22.63    2.028  0.30( 0.30) 1.00    4689.9   10830.00
      3    10213.27   23.51    1.976  0.30( 0.30) 1.00    4864.0   10630.00
      4    10428.53   34.96    1.540  0.30( 0.30) 1.00    7276.4   10600.00
      5    10516.92   42.05    1.411  0.30( 0.30) 1.00    8773.2   10500.00
      6    10557.66   46.36    1.342  0.30( 0.30) 1.00    9632.3   10710.00
      7    10500.99   48.51    1.309  0.30( 0.30) 1.00    9982.8   10410.00
      8    10530.00   53.08    1.250  0.30( 0.30) 1.00   10657.9   10700.00
      9    10549.73   59.58    1.176  0.30( 0.30) 1.00   11550.0   10400.00
     10    10491.15   62.05    1.160  0.30( 0.30) 1.00   11838.4   10200.00
     11    10291.24   67.98    1.128  0.30( 0.30) 1.00   12432.7   10300.00
     12    10286.50   68.07    1.127  0.30( 0.30) 1.00   12438.9   10320.00
     13     9974.16   72.48    1.103  0.30( 0.30) 1.00   12622.6   10210.00
     14     8755.59   99.00    0.977  0.30( 0.30) 1.00   13329.8   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   10557.66    Tc(MIN.) =    46.36
  EFFECTIVE AREA(ACRES) =    9632.28   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    13329.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10840.00 TO NODE  10841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1208.07  DOWNSTREAM(FEET) =   1119.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3050.12   CHANNEL SLOPE =  0.0292
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.290
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      222.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   10656.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.41
  AVERAGE FLOW DEPTH(FEET) =  10.98   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   49.66
  SUBAREA AREA(ACRES) =   222.84       SUBAREA RUNOFF(CFS) =  198.63
  EFFECTIVE AREA(ACRES) =   9855.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13552.6         PEAK FLOW RATE(CFS) =   10557.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.94   FLOW VELOCITY(FEET/SEC.) =  15.37
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10841.00 =   52177.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1119.03  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.14   CHANNEL SLOPE =  0.0238
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.56
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.271
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      265.26      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   10673.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.30
  AVERAGE FLOW DEPTH(FEET) =  11.55   TRAVEL TIME(MIN.) =   1.54
  Tc(MIN.) =   51.20
  SUBAREA AREA(ACRES) =   265.26       SUBAREA RUNOFF(CFS) =  231.91
  EFFECTIVE AREA(ACRES) =  10120.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13817.9         PEAK FLOW RATE(CFS) =   10557.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.49   FLOW VELOCITY(FEET/SEC.) =  14.26
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =   1
```



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----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   51.20
  RAINFALL INTENSITY(INCH/HR) =   1.27
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   10120.38
  TOTAL STREAM AREA(ACRES) =   13817.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   10557.66

****************************************************************************
  FLOW PROCESS FROM NODE  10850.00 TO NODE  10851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   311.88
  ELEVATION DATA: UPSTREAM(FEET) =   3029.66  DOWNSTREAM(FEET) =   2922.38

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.691
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.152
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.73      0.30     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.46
  TOTAL AREA(ACRES) =      2.73   PEAK FLOW RATE(CFS) =      9.46

****************************************************************************
  FLOW PROCESS FROM NODE  10851.00 TO NODE  10852.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2922.38  DOWNSTREAM(FEET) =   2684.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =   687.05   CHANNEL SLOPE =  0.3461
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.502
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.88
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   1.95
  Tc(MIN.) =   10.64
```

```
  SUBAREA AREA(ACRES) =     5.11       SUBAREA RUNOFF(CFS) =   14.73
  EFFECTIVE AREA(ACRES) =      7.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      22.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   6.56
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10852.00 =     998.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10852.00 TO NODE  10853.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2684.61  DOWNSTREAM(FEET) =   2306.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.58   CHANNEL SLOPE =  0.1966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.838
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      92.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.97
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   3.58
  Tc(MIN.) =   14.22
  SUBAREA AREA(ACRES) =    60.02       SUBAREA RUNOFF(CFS) =  137.08
  EFFECTIVE AREA(ACRES) =     67.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =     154.99
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.18   FLOW VELOCITY(FEET/SEC.) =  10.65
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10853.00 =    2923.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10853.00 TO NODE  10854.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2306.25  DOWNSTREAM(FEET) =   1555.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3225.53   CHANNEL SLOPE =  0.2329
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.97
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.404
```



```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      235.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     379.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.91
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =   17.82
  SUBAREA AREA(ACRES) =   235.82       SUBAREA RUNOFF(CFS) =  446.59
  EFFECTIVE AREA(ACRES) =    303.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.7         PEAK FLOW RATE(CFS) =     575.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.33   FLOW VELOCITY(FEET/SEC.) =  16.84
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10854.00 =    6149.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1555.12  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3294.22   CHANNEL SLOPE =  0.1419
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.18
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.100
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      247.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     775.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.34
  AVERAGE FLOW DEPTH(FEET) =   3.12   TRAVEL TIME(MIN.) =   3.58
  Tc(MIN.) =   21.40
  SUBAREA AREA(ACRES) =   247.64       SUBAREA RUNOFF(CFS) =  401.18
  EFFECTIVE AREA(ACRES) =    551.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      551.3         PEAK FLOW RATE(CFS) =     893.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.35   FLOW VELOCITY(FEET/SEC.) =  15.95
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10860.00 =    9443.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =   1
```

```
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.40
  RAINFALL INTENSITY(INCH/HR) =   2.10
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     551.32
  TOTAL STREAM AREA(ACRES) =     551.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     893.14

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9718.29   22.19    2.053  0.30( 0.30) 1.00    3999.9   10800.00
      1    10169.61   27.50    1.762  0.30( 0.30) 1.00    5178.0   10830.00
      1    10213.27   28.38    1.718  0.30( 0.30) 1.00    5352.1   10630.00
      1    10428.53   39.81    1.447  0.30( 0.30) 1.00    7764.5   10600.00
      1    10516.92   46.89    1.334  0.30( 0.30) 1.00    9261.3   10500.00
      1    10557.66   51.20    1.271  0.30( 0.30) 1.00   10120.4   10710.00
      1    10500.99   53.35    1.247  0.30( 0.30) 1.00   10470.9   10410.00
      1    10530.00   57.92    1.195  0.30( 0.30) 1.00   11146.0   10700.00
      1    10549.73   64.41    1.147  0.30( 0.30) 1.00   12038.1   10400.00
      1    10491.15   66.89    1.134  0.30( 0.30) 1.00   12326.5   10200.00
      1    10291.24   72.85    1.101  0.30( 0.30) 1.00   12920.8   10300.00
      1    10286.50   72.94    1.101  0.30( 0.30) 1.00   12927.0   10320.00
      1     9974.16   77.39    1.076  0.30( 0.30) 1.00   13110.7   10210.00
      1     8755.59  104.08    0.960  0.30( 0.30) 1.00   13817.9   10100.00
      2      893.14   21.40    2.100  0.30( 0.30) 1.00     551.3   10850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10512.40   21.40    2.100  0.30( 0.30) 1.00    4408.2   10850.00
      2    10588.35   22.19    2.053  0.30( 0.30) 1.00    4551.3   10800.00
      3    10895.30   27.50    1.762  0.30( 0.30) 1.00    5729.3   10830.00
      4    10916.83   28.38    1.718  0.30( 0.30) 1.00    5903.4   10630.00
      5    10997.56   39.81    1.447  0.30( 0.30) 1.00    8315.8   10600.00
      6    11030.09   46.89    1.334  0.30( 0.30) 1.00    9812.6   10500.00
      7    11039.66   51.20    1.271  0.30( 0.30) 1.00   10671.7   10710.00
      8    10970.83   53.35    1.247  0.30( 0.30) 1.00   11022.2   10410.00
      9    10973.99   57.92    1.195  0.30( 0.30) 1.00   11697.3   10700.00
     10    10970.04   64.41    1.147  0.30( 0.30) 1.00   12589.4   10400.00
     11    10904.78   66.89    1.134  0.30( 0.30) 1.00   12877.9   10200.00
     12    10688.82   72.85    1.101  0.30( 0.30) 1.00   13472.2   10300.00
     13    10683.83   72.94    1.101  0.30( 0.30) 1.00   13478.4   10320.00
     14    10359.48   77.39    1.076  0.30( 0.30) 1.00   13662.0   10210.00
     15     9082.94  104.08    0.960  0.30( 0.30) 1.00   14369.2   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   11039.66    Tc(MIN.) =    51.20
```



```
  EFFECTIVE AREA(ACRES) =   10671.70   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    14369.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1087.70  DOWNSTREAM(FEET) =    961.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4791.22   CHANNEL SLOPE =  0.0264
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.55
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.211
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      402.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   11204.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.06
  AVERAGE FLOW DEPTH(FEET) =  11.52   TRAVEL TIME(MIN.) =   5.30
  Tc(MIN.) =   56.50
  SUBAREA AREA(ACRES) =   402.51       SUBAREA RUNOFF(CFS) =  330.00
  EFFECTIVE AREA(ACRES) =  11074.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    14771.7          PEAK FLOW RATE(CFS) =   11039.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.44   FLOW VELOCITY(FEET/SEC.) =  15.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    14771.7  TC(MIN.) =     56.50
  EFFECTIVE AREA(ACRES) =  11074.21  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =   11039.66

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10512.40   26.76    1.800  0.30( 0.30) 1.00    4810.7   10850.00
      2    10588.35   27.54    1.760  0.30( 0.30) 1.00    4953.8   10800.00
      3    10895.30   32.81    1.582  0.30( 0.30) 1.00    6131.8   10830.00
      4    10916.83   33.69    1.565  0.30( 0.30) 1.00    6305.9   10630.00
      5    10997.56   45.11    1.362  0.30( 0.30) 1.00    8718.4   10600.00
      6    11030.09   52.19    1.260  0.30( 0.30) 1.00   10215.1   10500.00
      7    11039.66   56.50    1.211  0.30( 0.30) 1.00   11074.2   10710.00
      8    10970.83   58.66    1.186  0.30( 0.30) 1.00   11424.7   10410.00
      9    10973.99   63.23    1.153  0.30( 0.30) 1.00   12099.8   10700.00
```

10	10970.04	69.73	1.118	0.30(0.30)	1.00	12991.9	10400.00
11	10904.78	72.21	1.105	0.30(0.30)	1.00	13280.4	10200.00
12	10688.82	78.20	1.072	0.30(0.30)	1.00	13874.7	10300.00
13	10683.83	78.29	1.072	0.30(0.30)	1.00	13880.9	10320.00
14	10359.48	82.79	1.047	0.30(0.30)	1.00	14064.5	10210.00
15	9082.94	109.67	0.940	0.30(0.30)	1.00	14771.7	10100.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S9.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.650
   2)   10.00;  3.621
   3)   15.00;  2.692
   4)   20.00;  2.182
   5)   25.00;  1.889
   6)   30.00;  1.636
   7)   40.00;  1.443
   8)   50.00;  1.285
   9)   60.00;  1.171
  10)   90.00;  1.008
  11)  120.00;  0.905
  12)  180.00;  0.773
  13)  360.00;  0.594
  14) 1440.00;  0.268
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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************************************************************************
  FLOW PROCESS FROM NODE  10900.00 TO NODE  10901.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   305.17
  ELEVATION DATA: UPSTREAM(FEET) =   3291.76  DOWNSTREAM(FEET) =   3104.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.671
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.566
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.19      0.30     1.000      0    7.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.57
  TOTAL AREA(ACRES) =      1.19   PEAK FLOW RATE(CFS) =      4.57

************************************************************************
  FLOW PROCESS FROM NODE  10901.00 TO NODE  10902.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3104.08  DOWNSTREAM(FEET) =   2877.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   666.71   CHANNEL SLOPE =  0.3398
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.19
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.592
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        2.53      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.47
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   10.16
  SUBAREA AREA(ACRES) =     2.53       SUBAREA RUNOFF(CFS) =    7.49
  EFFECTIVE AREA(ACRES) =      3.72     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =      11.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   5.02
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10902.00 =     971.88 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10902.00 TO NODE  10903.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2877.50  DOWNSTREAM(FEET) =   2643.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.39   CHANNEL SLOPE =  0.1219
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.82
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.663
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.23
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   5.13
  Tc(MIN.) =   15.29
  SUBAREA AREA(ACRES) =    36.43       SUBAREA RUNOFF(CFS) =   77.46
  EFFECTIVE AREA(ACRES) =     40.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.2         PEAK FLOW RATE(CFS) =      85.37
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   7.47
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10903.00 =    2888.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10903.00 TO NODE  10904.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2643.95  DOWNSTREAM(FEET) =   2373.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.90   CHANNEL SLOPE =  0.1400
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.346
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     204.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.36
  AVERAGE FLOW DEPTH(FEET) =   1.52   TRAVEL TIME(MIN.) =   3.11
  Tc(MIN.) =   18.40
  SUBAREA AREA(ACRES) =   129.07       SUBAREA RUNOFF(CFS) =  237.63
  EFFECTIVE AREA(ACRES) =    169.22     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      169.2         PEAK FLOW RATE(CFS) =     311.55
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.92   FLOW VELOCITY(FEET/SEC.) =  11.74
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10904.00 =    4820.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10904.00 TO NODE  10905.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2373.49  DOWNSTREAM(FEET) =   1817.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2764.66   CHANNEL SLOPE =  0.2010
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.04
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.089
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     406.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.43
  AVERAGE FLOW DEPTH(FEET) =   2.01   TRAVEL TIME(MIN.) =   3.19
  Tc(MIN.) =   21.59
  SUBAREA AREA(ACRES) =   117.70       SUBAREA RUNOFF(CFS) =  189.50
  EFFECTIVE AREA(ACRES) =    286.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.9         PEAK FLOW RATE(CFS) =     461.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.15   FLOW VELOCITY(FEET/SEC.) =  14.99
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10905.00 =    7584.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10905.00 TO NODE  10906.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1817.76  DOWNSTREAM(FEET) =   1387.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2799.36   CHANNEL SLOPE =  0.1536
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.912
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      363.93      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     726.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.50
  AVERAGE FLOW DEPTH(FEET) =   2.95   TRAVEL TIME(MIN.) =   3.01
  Tc(MIN.) =   24.60
  SUBAREA AREA(ACRES) =   363.93       SUBAREA RUNOFF(CFS) =  528.16
  EFFECTIVE AREA(ACRES) =    650.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.8          PEAK FLOW RATE(CFS) =     944.55
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.38   FLOW VELOCITY(FEET/SEC.) =  16.69
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10906.00 =   10384.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1387.73  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2484.63   CHANNEL SLOPE =  0.1103
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.76
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.769
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     982.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.96
  AVERAGE FLOW DEPTH(FEET) =   3.75   TRAVEL TIME(MIN.) =   2.77
  Tc(MIN.) =   27.37
  SUBAREA AREA(ACRES) =    56.85       SUBAREA RUNOFF(CFS) =   75.17
  EFFECTIVE AREA(ACRES) =    707.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      707.7          PEAK FLOW RATE(CFS) =     944.55
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.67   FLOW VELOCITY(FEET/SEC.) =  14.82
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10920.00 =   12868.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
```



```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.37
  RAINFALL INTENSITY(INCH/HR) =   1.77
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     707.70
  TOTAL STREAM AREA(ACRES) =     707.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     944.55

****************************************************************************
  FLOW PROCESS FROM NODE  10910.00 TO NODE  10911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   287.29
  ELEVATION DATA: UPSTREAM(FEET) =   3119.43  DOWNSTREAM(FEET) =   3044.59

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.891
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.071
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.91      0.30     1.000     0    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.48
  TOTAL AREA(ACRES) =      1.91   PEAK FLOW RATE(CFS) =      6.48

****************************************************************************
  FLOW PROCESS FROM NODE  10911.00 TO NODE  10912.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3044.59  DOWNSTREAM(FEET) =   2980.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.50   CHANNEL SLOPE =  0.1015
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.274
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.51
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   2.98
  Tc(MIN.) =   11.87
  SUBAREA AREA(ACRES) =     4.16       SUBAREA RUNOFF(CFS) =   11.13
  EFFECTIVE AREA(ACRES) =      6.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```

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  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =      16.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   3.93
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10912.00 =     914.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10912.00 TO NODE  10913.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2980.93  DOWNSTREAM(FEET) =   2876.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =   984.99   CHANNEL SLOPE =  0.1065
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.725
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.86      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.56
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   2.95
  Tc(MIN.) =   14.82
  SUBAREA AREA(ACRES) =    22.86       SUBAREA RUNOFF(CFS) =   49.89
  EFFECTIVE AREA(ACRES) =     28.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.9         PEAK FLOW RATE(CFS) =      63.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) =   6.47
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10913.00 =    1899.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10913.00 TO NODE  10914.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2876.01  DOWNSTREAM(FEET) =   2832.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   939.99   CHANNEL SLOPE =  0.0465
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.54
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.439
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



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  USER-DEFINED               -       53.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     114.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.90
  AVERAGE FLOW DEPTH(FEET) =   1.49   TRAVEL TIME(MIN.) =   2.66
  Tc(MIN.) =   17.48
  SUBAREA AREA(ACRES) =    53.02       SUBAREA RUNOFF(CFS) =  102.08
  EFFECTIVE AREA(ACRES) =     81.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       81.9         PEAK FLOW RATE(CFS) =     157.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.78   FLOW VELOCITY(FEET/SEC.) =   6.53
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10914.00 =    2839.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10914.00 TO NODE  10915.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2832.29  DOWNSTREAM(FEET) =   2769.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1006.52   CHANNEL SLOPE =  0.0623
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.10
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.229
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.80      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     236.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.15
  AVERAGE FLOW DEPTH(FEET) =   2.06   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =   19.54
  SUBAREA AREA(ACRES) =    90.80       SUBAREA RUNOFF(CFS) =  157.67
  EFFECTIVE AREA(ACRES) =    172.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      172.8         PEAK FLOW RATE(CFS) =     299.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.34   FLOW VELOCITY(FEET/SEC.) =   8.74
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10915.00 =    3846.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10915.00 TO NODE  10916.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2769.58  DOWNSTREAM(FEET) =   2453.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3003.36   CHANNEL SLOPE =  0.1053
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.87
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.973
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      311.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     535.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.43
  AVERAGE FLOW DEPTH(FEET) =   2.77   TRAVEL TIME(MIN.) =   4.03
  Tc(MIN.) =   23.56
  SUBAREA AREA(ACRES) =   311.96       SUBAREA RUNOFF(CFS) =  469.76
  EFFECTIVE AREA(ACRES) =    484.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      484.7         PEAK FLOW RATE(CFS) =     729.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.26   FLOW VELOCITY(FEET/SEC.) =  13.55
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10916.00 =    6849.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10916.00 TO NODE  10917.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.21  DOWNSTREAM(FEET) =   1787.18
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2846.14   CHANNEL SLOPE =  0.2340
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.97
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.836
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     894.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.15
  AVERAGE FLOW DEPTH(FEET) =   2.94   TRAVEL TIME(MIN.) =   2.48
  Tc(MIN.) =   26.04
  SUBAREA AREA(ACRES) =   238.62       SUBAREA RUNOFF(CFS) =  329.94
  EFFECTIVE AREA(ACRES) =    723.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      723.3         PEAK FLOW RATE(CFS) =    1000.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.12
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.12   FLOW VELOCITY(FEET/SEC.) =  19.76
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10917.00 =    9695.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10917.00 TO NODE  10918.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1787.18  DOWNSTREAM(FEET) =   1279.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2918.23   CHANNEL SLOPE =  0.1741
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.54
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.701
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      150.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1095.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.19
  AVERAGE FLOW DEPTH(FEET) =   3.53   TRAVEL TIME(MIN.) =   2.67
  Tc(MIN.) =   28.72
  SUBAREA AREA(ACRES) =   150.63       SUBAREA RUNOFF(CFS) =  189.93
  EFFECTIVE AREA(ACRES) =    873.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      874.0         PEAK FLOW RATE(CFS) =    1102.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.54   FLOW VELOCITY(FEET/SEC.) =  18.20
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10918.00 =   12614.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1279.22  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.50   CHANNEL SLOPE =  0.0995
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.15
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.625
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1137.88
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.00
  AVERAGE FLOW DEPTH(FEET) =   4.15   TRAVEL TIME(MIN.) =   1.85
  Tc(MIN.) =   30.57
  SUBAREA AREA(ACRES) =    60.16       SUBAREA RUNOFF(CFS) =   71.75
  EFFECTIVE AREA(ACRES) =    934.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      934.1         PEAK FLOW RATE(CFS) =    1114.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.10   FLOW VELOCITY(FEET/SEC.) =  14.92
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.57
  RAINFALL INTENSITY(INCH/HR) =   1.63
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     934.12
  TOTAL STREAM AREA(ACRES) =     934.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1114.06

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      944.55   27.37    1.769  0.30( 0.30) 1.00     707.7   10900.00
      2     1114.06   30.57    1.625  0.30( 0.30) 1.00     934.1   10910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2050.52   27.37    1.769  0.30( 0.30) 1.00    1544.1   10900.00
      2     1965.96   30.57    1.625  0.30( 0.30) 1.00    1641.8   10910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2050.52    Tc(MIN.) =    27.37
  EFFECTIVE AREA(ACRES) =    1544.08   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1641.8
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1113.60  DOWNSTREAM(FEET) =    961.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2282.16   CHANNEL SLOPE =  0.0668
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.644
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      185.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2162.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.35
  AVERAGE FLOW DEPTH(FEET) =   6.26   TRAVEL TIME(MIN.) =   2.48
  Tc(MIN.) =   29.85
  SUBAREA AREA(ACRES) =   185.67       SUBAREA RUNOFF(CFS) =  224.56
  EFFECTIVE AREA(ACRES) =   1729.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1827.5         PEAK FLOW RATE(CFS) =    2092.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.16   FLOW VELOCITY(FEET/SEC.) =  15.22
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10921.00 =   16560.68 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2092.05   29.85    1.644  0.30( 0.30) 1.00    1729.8   10900.00
      2     2100.01   33.07    1.577  0.30( 0.30) 1.00    1827.5   10910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2100.01  Tc(MIN.) =   33.07
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1827.49
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1827.5  TC(MIN.) =     33.07
  EFFECTIVE AREA(ACRES) =   1827.49  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    2100.01

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2092.05   29.85    1.644  0.30( 0.30) 1.00    1729.8   10900.00
      2     2100.01   33.07    1.577  0.30( 0.30) 1.00    1827.5   10910.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




------------------------------------------------------------------------------
  FILE NAME: S10.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.518
   2)   10.00;  3.546
   3)   15.00;  2.648
   4)   20.00;  2.153
   5)   25.00;  1.866
   6)   30.00;  1.620
   7)   40.00;  1.426
   8)   50.00;  1.269
   9)   60.00;  1.152
  10)   90.00;  0.988
  11)  120.00;  0.884
  12)  180.00;  0.752
  13)  360.00;  0.575
  14) 1440.00;  0.259
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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******************************************************************************
  FLOW PROCESS FROM NODE  11000.00 TO NODE  11001.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   362.38
  ELEVATION DATA: UPSTREAM(FEET) =   2528.19  DOWNSTREAM(FEET) =   2375.55

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.863
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.995
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        2.03      0.30     1.000     0    8.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.75
  TOTAL AREA(ACRES) =      2.03   PEAK FLOW RATE(CFS) =      6.75

******************************************************************************
  FLOW PROCESS FROM NODE  11001.00 TO NODE  11002.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2375.55  DOWNSTREAM(FEET) =   2005.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.45   CHANNEL SLOPE =  0.6438
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.19
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.467
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        3.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.08
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   1.58
  Tc(MIN.) =   10.44
  SUBAREA AREA(ACRES) =     3.14       SUBAREA RUNOFF(CFS) =    8.95
  EFFECTIVE AREA(ACRES) =      5.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2         PEAK FLOW RATE(CFS) =      14.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   6.77
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11002.00 =     937.83 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  11002.00 TO NODE  11003.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2005.09  DOWNSTREAM(FEET) =   1450.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.43   CHANNEL SLOPE =  0.5763
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.150
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.09
  AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   1.77
  Tc(MIN.) =   12.20
  SUBAREA AREA(ACRES) =    16.53       SUBAREA RUNOFF(CFS) =   42.40
  EFFECTIVE AREA(ACRES) =     21.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.7         PEAK FLOW RATE(CFS) =      55.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.48   FLOW VELOCITY(FEET/SEC.) =  10.68
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11003.00 =    1900.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.44  DOWNSTREAM(FEET) =    939.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1351.71   CHANNEL SLOPE =  0.3779
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.785
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.99      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      90.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.07
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   2.03
  Tc(MIN.) =   14.24
  SUBAREA AREA(ACRES) =    30.99       SUBAREA RUNOFF(CFS) =   69.30
  EFFECTIVE AREA(ACRES) =     52.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       52.7         PEAK FLOW RATE(CFS) =     117.83
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =  12.10
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S8.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    10512.40   26.76  0.30( 0.30) 1.00    4810.7   10850.00
      2    10588.35   27.54  0.30( 0.30) 1.00    4953.8   10800.00
      3    10895.30   32.81  0.30( 0.30) 1.00    6131.8   10830.00
      4    10916.83   33.69  0.30( 0.30) 1.00    6305.9   10630.00
      5    10997.56   45.11  0.30( 0.30) 1.00    8718.4   10600.00
      6    11030.09   52.19  0.30( 0.30) 1.00   10215.1   10500.00
      7    11039.66   56.50  0.30( 0.30) 1.00   11074.2   10710.00
      8    10970.83   58.66  0.30( 0.30) 1.00   11424.7   10410.00
      9    10973.99   63.23  0.30( 0.30) 1.00   12099.8   10700.00
     10    10970.04   69.73  0.30( 0.30) 1.00   12991.9   10400.00
     11    10904.78   72.21  0.30( 0.30) 1.00   13280.4   10200.00
     12    10688.82   78.20  0.30( 0.30) 1.00   13874.7   10300.00
     13    10683.83   78.29  0.30( 0.30) 1.00   13880.9   10320.00
     14    10359.48   82.79  0.30( 0.30) 1.00   14064.5   10210.00
     15     9082.94  109.67  0.30( 0.30) 1.00   14771.7   10100.00
    TOTAL AREA(ACRES) =    14771.7

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S9.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2092.05   29.85  0.30( 0.30) 1.00    1729.8   10900.00
      2     2100.01   33.07  0.30( 0.30) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =     1827.5

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     2092.05   29.85  0.30( 0.30) 1.00    1729.8   10900.00
     2     2100.01   33.07  0.30( 0.30) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =      1827.5

****************************************************************************
 FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2092.05   29.85    1.628  0.30( 0.30) 1.00    1729.8   10900.00
     2     2100.01   33.07    1.560  0.30( 0.30) 1.00    1827.5   10910.00
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10921.00 =   16560.68 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    10512.40   26.76    1.780  0.30( 0.30) 1.00    4810.7   10850.00
     2    10588.35   27.54    1.741  0.30( 0.30) 1.00    4953.8   10800.00
     3    10895.30   32.81    1.565  0.30( 0.30) 1.00    6131.8   10830.00
     4    10916.83   33.69    1.548  0.30( 0.30) 1.00    6305.9   10630.00
     5    10997.56   45.11    1.346  0.30( 0.30) 1.00    8718.4   10600.00
     6    11030.09   52.19    1.243  0.30( 0.30) 1.00   10215.1   10500.00
     7    11039.66   56.50    1.193  0.30( 0.30) 1.00   11074.2   10710.00
     8    10970.83   58.66    1.168  0.30( 0.30) 1.00   11424.7   10410.00
     9    10973.99   63.23    1.134  0.30( 0.30) 1.00   12099.8   10700.00
    10    10970.04   69.73    1.099  0.30( 0.30) 1.00   12991.9   10400.00
    11    10904.78   72.21    1.085  0.30( 0.30) 1.00   13280.4   10200.00
    12    10688.82   78.20    1.053  0.30( 0.30) 1.00   13874.7   10300.00
    13    10683.83   78.29    1.052  0.30( 0.30) 1.00   13880.9   10320.00
    14    10359.48   82.79    1.027  0.30( 0.30) 1.00   14064.5   10210.00
    15     9082.94  109.67    0.920  0.30( 0.30) 1.00   14771.7   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    12602.61   26.76    1.780  0.30( 0.30) 1.00    6361.3   10850.00
     2    12680.41   27.54    1.741  0.30( 0.30) 1.00    6549.9   10800.00
     3    12814.63   29.85    1.628  0.30( 0.30) 1.00    7198.7   10900.00
     4    12994.67   32.81    1.565  0.30( 0.30) 1.00    7951.5   10830.00
     5    13001.62   33.07    1.560  0.30( 0.30) 1.00    8010.4   10910.00
     6    12996.75   33.69    1.548  0.30( 0.30) 1.00    8133.4   10630.00
     7    12739.93   45.11    1.346  0.30( 0.30) 1.00   10545.8   10600.00
     8    12601.86   52.19    1.243  0.30( 0.30) 1.00   12042.6   10500.00
     9    12527.41   56.50    1.193  0.30( 0.30) 1.00   12901.7   10710.00
    10    12416.51   58.66    1.168  0.30( 0.30) 1.00   13252.2   10410.00
    11    12364.12   63.23    1.134  0.30( 0.30) 1.00   13927.3   10700.00
    12    12301.02   69.73    1.099  0.30( 0.30) 1.00   14819.4   10400.00
    13    12213.10   72.21    1.085  0.30( 0.30) 1.00   15107.9   10200.00
    14    11942.66   78.20    1.053  0.30( 0.30) 1.00   15702.2   10300.00
```



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    15    11936.82   78.29    1.052  0.30( 0.30) 1.00   15708.4   10320.00
    16    11571.50   82.79    1.027  0.30( 0.30) 1.00   15892.0   10210.00
    17    10115.67  109.67    0.920  0.30( 0.30) 1.00   16599.2   10100.00
   TOTAL AREA(ACRES) =     16599.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    13001.62  Tc(MIN.) =   33.071
 EFFECTIVE AREA(ACRES) =   8010.35  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =    16599.2
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10921.00 TO NODE  11020.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    961.06  DOWNSTREAM(FEET) =    939.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =   601.65   CHANNEL SLOPE =  0.0356
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.56
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.551
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       18.29      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13011.91
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.99
 AVERAGE FLOW DEPTH(FEET) =  10.56   TRAVEL TIME(MIN.) =   0.50
 Tc(MIN.) =   33.57
 SUBAREA AREA(ACRES) =    18.29       SUBAREA RUNOFF(CFS) =   20.59
 EFFECTIVE AREA(ACRES) =   8028.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    16617.5         PEAK FLOW RATE(CFS) =   13001.62
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.55

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.55   FLOW VELOCITY(FEET/SEC.) =  19.98
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    12602.61   27.26    1.755  0.30( 0.30) 1.00    6379.6   10850.00
     2    12680.41   28.05    1.716  0.30( 0.30) 1.00    6568.2   10800.00
     3    12814.63   30.35    1.613  0.30( 0.30) 1.00    7217.0   10900.00
     4    12994.67   33.31    1.556  0.30( 0.30) 1.00    7969.8   10830.00
     5    13001.62   33.57    1.551  0.30( 0.30) 1.00    8028.6   10910.00
     6    12996.75   34.19    1.539  0.30( 0.30) 1.00    8151.7   10630.00
     7    12739.93   45.61    1.338  0.30( 0.30) 1.00   10564.1   10600.00
     8    12601.86   52.70    1.237  0.30( 0.30) 1.00   12060.9   10500.00
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      9    12527.41   57.01    1.187  0.30( 0.30) 1.00   12920.0   10710.00
     10    12416.51   59.17    1.162  0.30( 0.30) 1.00   13270.5   10410.00
     11    12364.12   63.74    1.132  0.30( 0.30) 1.00   13945.6   10700.00
     12    12301.02   70.24    1.096  0.30( 0.30) 1.00   14837.7   10400.00
     13    12213.10   72.72    1.082  0.30( 0.30) 1.00   15126.2   10200.00
     14    11942.66   78.71    1.050  0.30( 0.30) 1.00   15720.4   10300.00
     15    11936.82   78.80    1.049  0.30( 0.30) 1.00   15726.7   10320.00
     16    11571.50   83.31    1.025  0.30( 0.30) 1.00   15910.3   10210.00
     17    10115.67  110.21    0.918  0.30( 0.30) 1.00   16617.5   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   13001.62  Tc(MIN.) =   33.57
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    8028.64

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12602.61   27.26    1.755  0.30( 0.30) 1.00    6379.6   10850.00
      2    12680.41   28.05    1.716  0.30( 0.30) 1.00    6568.2   10800.00
      3    12814.63   30.35    1.613  0.30( 0.30) 1.00    7217.0   10900.00
      4    12994.67   33.31    1.556  0.30( 0.30) 1.00    7969.8   10830.00
      5    13001.62   33.57    1.551  0.30( 0.30) 1.00    8028.6   10910.00
      6    12996.75   34.19    1.539  0.30( 0.30) 1.00    8151.7   10630.00
      7    12739.93   45.61    1.338  0.30( 0.30) 1.00   10564.1   10600.00
      8    12601.86   52.70    1.237  0.30( 0.30) 1.00   12060.9   10500.00
      9    12527.41   57.01    1.187  0.30( 0.30) 1.00   12920.0   10710.00
     10    12416.51   59.17    1.162  0.30( 0.30) 1.00   13270.5   10410.00
     11    12364.12   63.74    1.132  0.30( 0.30) 1.00   13945.6   10700.00
     12    12301.02   70.24    1.096  0.30( 0.30) 1.00   14837.7   10400.00
     13    12213.10   72.72    1.082  0.30( 0.30) 1.00   15126.2   10200.00
     14    11942.66   78.71    1.050  0.30( 0.30) 1.00   15720.4   10300.00
     15    11936.82   78.80    1.049  0.30( 0.30) 1.00   15726.7   10320.00
     16    11571.50   83.31    1.025  0.30( 0.30) 1.00   15910.3   10210.00
     17    10115.67  110.21    0.918  0.30( 0.30) 1.00   16617.5   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      117.83   14.24    2.785  0.30( 0.30) 1.00      52.7   11000.00
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11359.78   14.24    2.785  0.30( 0.30) 1.00    3384.9   11000.00
      2    12671.60   27.26    1.755  0.30( 0.30) 1.00    6432.3   10850.00
      3    12747.57   28.05    1.716  0.30( 0.30) 1.00    6620.9   10800.00
      4    12876.91   30.35    1.613  0.30( 0.30) 1.00    7269.6   10900.00
      5    13054.22   33.31    1.556  0.30( 0.30) 1.00    8022.5   10830.00
      6    13060.93   33.57    1.551  0.30( 0.30) 1.00    8081.3   10910.00
      7    13055.49   34.19    1.539  0.30( 0.30) 1.00    8204.4   10630.00
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      8    12789.15   45.61    1.338  0.30( 0.30) 1.00   10616.8   10600.00
      9    12646.32   52.70    1.237  0.30( 0.30) 1.00   12113.6   10500.00
     10    12569.47   57.01    1.187  0.30( 0.30) 1.00   12972.7   10710.00
     11    12457.38   59.17    1.162  0.30( 0.30) 1.00   13323.2   10410.00
     12    12403.56   63.74    1.132  0.30( 0.30) 1.00   13998.3   10700.00
     13    12338.77   70.24    1.096  0.30( 0.30) 1.00   14890.4   10400.00
     14    12250.21   72.72    1.082  0.30( 0.30) 1.00   15178.8   10200.00
     15    11978.22   78.71    1.050  0.30( 0.30) 1.00   15773.1   10300.00
     16    11972.35   78.80    1.049  0.30( 0.30) 1.00   15779.3   10320.00
     17    11605.86   83.31    1.025  0.30( 0.30) 1.00   15963.0   10210.00
     18    10144.97  110.21    0.918  0.30( 0.30) 1.00   16670.2   10100.00
    TOTAL AREA(ACRES) =     16670.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    13060.93  Tc(MIN.) =   33.573
  EFFECTIVE AREA(ACRES) =   8081.33  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    16670.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11020.00 TO NODE  11021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.63  DOWNSTREAM(FEET) =    865.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2876.19   CHANNEL SLOPE =  0.0259
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.49
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.499
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      191.02      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13163.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.83
  AVERAGE FLOW DEPTH(FEET) =  11.46   TRAVEL TIME(MIN.) =   2.69
  Tc(MIN.) =   36.26
  SUBAREA AREA(ACRES) =   191.02       SUBAREA RUNOFF(CFS) =  206.06
  EFFECTIVE AREA(ACRES) =   8272.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    16861.2         PEAK FLOW RATE(CFS) =   13060.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.42   FLOW VELOCITY(FEET/SEC.) =  17.79
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11021.00 =   61764.91 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
     1    11359.78   17.02    2.448  0.30( 0.30) 1.00    3576.0   11000.00
     2    12671.60   29.97    1.621  0.30( 0.30) 1.00    6623.3   10850.00
     3    12747.57   30.75    1.605  0.30( 0.30) 1.00    6811.9   10800.00
     4    12876.91   33.05    1.561  0.30( 0.30) 1.00    7460.7   10900.00
     5    13054.22   36.00    1.504  0.30( 0.30) 1.00    8213.5   10830.00
     6    13060.93   36.26    1.499  0.30( 0.30) 1.00    8272.4   10910.00
     7    13055.49   36.88    1.486  0.30( 0.30) 1.00    8395.4   10630.00
     8    12789.15   48.32    1.295  0.30( 0.30) 1.00   10807.8   10600.00
     9    12646.32   55.41    1.206  0.30( 0.30) 1.00   12304.6   10500.00
    10    12569.47   59.73    1.155  0.30( 0.30) 1.00   13163.7   10710.00
    11    12457.38   61.89    1.142  0.30( 0.30) 1.00   13514.2   10410.00
    12    12403.56   66.47    1.117  0.30( 0.30) 1.00   14189.3   10700.00
    13    12338.77   72.97    1.081  0.30( 0.30) 1.00   15081.4   10400.00
    14    12250.21   75.46    1.067  0.30( 0.30) 1.00   15369.9   10200.00
    15    11978.22   81.46    1.035  0.30( 0.30) 1.00   15964.2   10300.00
    16    11972.35   81.56    1.034  0.30( 0.30) 1.00   15970.4   10320.00
    17    11605.86   86.08    1.009  0.30( 0.30) 1.00   16154.0   10210.00
    18    10144.97  113.08    0.908  0.30( 0.30) 1.00   16861.2   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   13060.93  Tc(MIN.) =   36.26
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    8272.35

****************************************************************************
  FLOW PROCESS FROM NODE  11021.00 TO NODE  11022.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    865.22  DOWNSTREAM(FEET) =    752.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.47   CHANNEL SLOPE =  0.0389
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.45
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.453
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13227.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.75
  AVERAGE FLOW DEPTH(FEET) =  10.41   TRAVEL TIME(MIN.) =   2.32
  Tc(MIN.) =   38.58
  SUBAREA AREA(ACRES) =   320.06       SUBAREA RUNOFF(CFS) =  332.28
  EFFECTIVE AREA(ACRES) =   8592.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17181.2         PEAK FLOW RATE(CFS) =   13060.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.35   FLOW VELOCITY(FEET/SEC.) =  20.68
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11022.00 =   64657.38 FEET.
```



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  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1    11359.78   19.43    2.210  0.30( 0.30) 1.00    3896.0   11000.00
      2    12671.60   32.31    1.575  0.30( 0.30) 1.00    6943.4   10850.00
      3    12747.57   33.09    1.560  0.30( 0.30) 1.00    7132.0   10800.00
      4    12876.91   35.38    1.516  0.30( 0.30) 1.00    7780.7   10900.00
      5    13054.22   38.33    1.458  0.30( 0.30) 1.00    8533.6   10830.00
      6    13060.93   38.58    1.453  0.30( 0.30) 1.00    8592.4   10910.00
      7    13055.49   39.21    1.441  0.30( 0.30) 1.00    8715.5   10630.00
      8    12789.15   50.66    1.261  0.30( 0.30) 1.00   11127.9   10600.00
      9    12646.32   57.76    1.178  0.30( 0.30) 1.00   12624.7   10500.00
     10    12569.47   62.08    1.141  0.30( 0.30) 1.00   13483.8   10710.00
     11    12457.38   64.25    1.129  0.30( 0.30) 1.00   13834.2   10410.00
     12    12403.56   68.82    1.104  0.30( 0.30) 1.00   14509.4   10700.00
     13    12338.77   75.33    1.068  0.30( 0.30) 1.00   15401.4   10400.00
     14    12250.21   77.83    1.055  0.30( 0.30) 1.00   15689.9   10200.00
     15    11978.22   83.84    1.022  0.30( 0.30) 1.00   16284.2   10300.00
     16    11972.35   83.94    1.021  0.30( 0.30) 1.00   16290.4   10320.00
     17    11605.86   88.48    0.996  0.30( 0.30) 1.00   16474.1   10210.00
     18    10144.97  115.57    0.899  0.30( 0.30) 1.00   17181.2   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   13060.93  Tc(MIN.) =   38.58
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    8592.41

****************************************************************************
  FLOW PROCESS FROM NODE  11022.00 TO NODE  11023.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    752.60  DOWNSTREAM(FEET) =    737.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.15   CHANNEL SLOPE =  0.0081
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.11
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.406
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      226.98      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13174.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.61
  AVERAGE FLOW DEPTH(FEET) =  15.08   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   41.26
  SUBAREA AREA(ACRES) =   226.98       SUBAREA RUNOFF(CFS) =  226.85
  EFFECTIVE AREA(ACRES) =   8819.39     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17408.2         PEAK FLOW RATE(CFS) =   13060.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

DEPTH(FEET) = 15.02 FLOW VELOCITY(FEET/SEC.) = 11.59
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11023.00 = 66521.52 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11359.78	22.20	2.027	0.30(0.30)	1.00	4123.0	11000.00
2	12671.60	35.01	1.523	0.30(0.30)	1.00	7170.4	10850.00
3	12747.57	35.78	1.508	0.30(0.30)	1.00	7359.0	10800.00
4	12876.91	38.06	1.464	0.30(0.30)	1.00	8007.7	10900.00
5	13054.22	41.00	1.410	0.30(0.30)	1.00	8760.6	10830.00
6	13060.93	41.26	1.406	0.30(0.30)	1.00	8819.4	10910.00
7	13055.49	41.88	1.396	0.30(0.30)	1.00	8942.4	10630.00
8	12789.15	53.35	1.230	0.30(0.30)	1.00	11354.9	10600.00
9	12646.32	60.45	1.150	0.30(0.30)	1.00	12851.6	10500.00
10	12569.47	64.78	1.126	0.30(0.30)	1.00	13710.7	10710.00
11	12457.38	66.96	1.114	0.30(0.30)	1.00	14061.2	10410.00
12	12403.56	71.54	1.089	0.30(0.30)	1.00	14736.4	10700.00
13	12338.77	78.05	1.053	0.30(0.30)	1.00	15628.4	10400.00
14	12250.21	80.55	1.040	0.30(0.30)	1.00	15916.9	10200.00
15	11978.22	86.58	1.007	0.30(0.30)	1.00	16511.2	10300.00
16	11972.35	86.67	1.006	0.30(0.30)	1.00	16517.4	10320.00
17	11605.86	91.24	0.984	0.30(0.30)	1.00	16701.1	10210.00
18	10144.97	118.43	0.889	0.30(0.30)	1.00	17408.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 13060.93 Tc(MIN.) = 41.26
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 8819.39

****
FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 737.50 DOWNSTREAM(FEET) = 678.93
CHANNEL LENGTH THRU SUBAREA(FEET) = 2632.50 CHANNEL SLOPE = 0.0222
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.88
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.365
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	124.84	0.30	0.992	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.992
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13120.92
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.85
AVERAGE FLOW DEPTH(FEET) = 11.87 TRAVEL TIME(MIN.) = 2.60
Tc(MIN.) = 43.86
SUBAREA AREA(ACRES) = 124.84 SUBAREA RUNOFF(CFS) = 119.98
EFFECTIVE AREA(ACRES) = 8944.23 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 17533.1 PEAK FLOW RATE(CFS) = 13060.93
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050

*ESTIMATED CHANNEL HEIGHT(FEET) = 11.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.84 FLOW VELOCITY(FEET/SEC.) = 16.83
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11359.78	24.90	1.872	0.30(0.30)	1.00	4247.8	11000.00
2	12671.60	37.63	1.472	0.30(0.30)	1.00	7295.2	10850.00
3	12747.57	38.40	1.457	0.30(0.30)	1.00	7483.8	10800.00
4	12876.91	40.68	1.415	0.30(0.30)	1.00	8132.5	10900.00
5	13054.22	43.61	1.369	0.30(0.30)	1.00	8885.4	10830.00
6	13060.93	43.86	1.365	0.30(0.30)	1.00	8944.2	10910.00
7	13055.49	44.49	1.356	0.30(0.30)	1.00	9067.3	10630.00
8	12789.15	55.97	1.199	0.30(0.30)	1.00	11479.7	10600.00
9	12646.32	63.08	1.135	0.30(0.30)	1.00	12976.5	10500.00
10	12569.47	67.41	1.111	0.30(0.30)	1.00	13835.6	10710.00
11	12457.38	69.59	1.100	0.30(0.30)	1.00	14186.1	10410.00
12	12403.56	74.18	1.075	0.30(0.30)	1.00	14861.2	10700.00
13	12338.77	80.69	1.039	0.30(0.30)	1.00	15753.3	10400.00
14	12250.21	83.20	1.025	0.30(0.30)	1.00	16041.7	10200.00
15	11978.22	89.24	0.992	0.30(0.30)	1.00	16636.0	10300.00
16	11972.35	89.34	0.992	0.30(0.30)	1.00	16642.2	10320.00
17	11605.86	93.93	0.974	0.30(0.30)	1.00	16825.9	10210.00
18	10144.97	121.22	0.881	0.30(0.30)	1.00	17533.1	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 13060.93 Tc(MIN.) = 43.86
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 8944.23
==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 17533.1 TC(MIN.) = 43.86
EFFECTIVE AREA(ACRES) = 8944.23 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999
PEAK FLOW RATE(CFS) = 13060.93

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11359.78	24.90	1.872	0.30(0.30)	1.00	4247.8	11000.00
2	12671.60	37.63	1.472	0.30(0.30)	1.00	7295.2	10850.00
3	12747.57	38.40	1.457	0.30(0.30)	1.00	7483.8	10800.00
4	12876.91	40.68	1.415	0.30(0.30)	1.00	8132.5	10900.00
5	13054.22	43.61	1.369	0.30(0.30)	1.00	8885.4	10830.00
6	13060.93	43.86	1.365	0.30(0.30)	1.00	8944.2	10910.00
7	13055.49	44.49	1.356	0.30(0.30)	1.00	9067.3	10630.00
8	12789.15	55.97	1.199	0.30(0.30)	1.00	11479.7	10600.00
9	12646.32	63.08	1.135	0.30(0.30)	1.00	12976.5	10500.00
10	12569.47	67.41	1.111	0.30(0.30)	1.00	13835.6	10710.00
11	12457.38	69.59	1.100	0.30(0.30)	1.00	14186.1	10410.00
12	12403.56	74.18	1.075	0.30(0.30)	1.00	14861.2	10700.00
13	12338.77	80.69	1.039	0.30(0.30)	1.00	15753.3	10400.00
14	12250.21	83.20	1.025	0.30(0.30)	1.00	16041.7	10200.00
15	11978.22	89.24	0.992	0.30(0.30)	1.00	16636.0	10300.00
16	11972.35	89.34	0.992	0.30(0.30)	1.00	16642.2	10320.00
17	11605.86	93.93	0.974	0.30(0.30)	1.00	16825.9	10210.00

```
    18    10144.97  121.22    0.881  0.30( 0.30) 1.00   17533.1   10100.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
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****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S11.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.518
   2)   10.00;  3.546
   3)   15.00;  2.648
   4)   20.00;  2.153
   5)   25.00;  1.866
   6)   30.00;  1.620
   7)   40.00;  1.426
   8)   50.00;  1.269
   9)   60.00;  1.152
  10)   90.00;  0.988
  11)  120.00;  0.884
  12)  180.00;  0.752
  13)  360.00;  0.575
  14) 1440.00;  0.259
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11101.00 TO NODE  11102.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   920.30
  ELEVATION DATA: UPSTREAM(FEET) =   4391.58  DOWNSTREAM(FEET) =   4080.28

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.444
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.927
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.68      0.30     1.000      0   13.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.34
  TOTAL AREA(ACRES) =      2.68   PEAK FLOW RATE(CFS) =      6.34

****************************************************************************
  FLOW PROCESS FROM NODE  11102.00 TO NODE  11103.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4080.28  DOWNSTREAM(FEET) =   3876.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.85   CHANNEL SLOPE =  0.2123
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.586
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.96      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.32
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   2.19
  Tc(MIN.) =   15.63
  SUBAREA AREA(ACRES) =    39.96       SUBAREA RUNOFF(CFS) =   82.20
  EFFECTIVE AREA(ACRES) =     42.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       42.6          PEAK FLOW RATE(CFS) =      87.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   9.08
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11103.00 =    1880.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11103.00 TO NODE  11104.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3876.52  DOWNSTREAM(FEET) =   3625.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1902.80   CHANNEL SLOPE =  0.1317
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.37
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.247
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.27
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   3.42
  Tc(MIN.) =   19.05
  SUBAREA AREA(ACRES) =    75.64       SUBAREA RUNOFF(CFS) =  132.54
  EFFECTIVE AREA(ACRES) =    118.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.3         PEAK FLOW RATE(CFS) =     207.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.55   FLOW VELOCITY(FEET/SEC.) =  10.18
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11104.00 =    3782.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11104.00 TO NODE  11105.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3625.86  DOWNSTREAM(FEET) =   3222.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2898.91   CHANNEL SLOPE =  0.1391
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.06
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.976
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      167.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     334.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.96
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   23.09
  SUBAREA AREA(ACRES) =   167.73       SUBAREA RUNOFF(CFS) =  252.96
  EFFECTIVE AREA(ACRES) =    286.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.0         PEAK FLOW RATE(CFS) =     431.34
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.29   FLOW VELOCITY(FEET/SEC.) =  12.91
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11105.00 =    6681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3222.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2480.35   CHANNEL SLOPE =  0.1089
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.97
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.803
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      252.33      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     602.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.99
  AVERAGE FLOW DEPTH(FEET) =   2.92   TRAVEL TIME(MIN.) =   3.18
  Tc(MIN.) =   26.27
  SUBAREA AREA(ACRES) =   252.33       SUBAREA RUNOFF(CFS) =  341.43
  EFFECTIVE AREA(ACRES) =    538.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      538.3         PEAK FLOW RATE(CFS) =     728.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.23   FLOW VELOCITY(FEET/SEC.) =  13.70
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11121.00 =    9162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.27
  RAINFALL INTENSITY(INCH/HR) =   1.80
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     538.34
  TOTAL STREAM AREA(ACRES) =     538.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     728.43
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11111.00 TO NODE  11112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   329.73
  ELEVATION DATA: UPSTREAM(FEET) =   4094.14  DOWNSTREAM(FEET) =   3956.68

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.552
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.117
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.49      0.30     1.000     0    8.55
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.12
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      5.12

****************************************************************************
  FLOW PROCESS FROM NODE  11112.00 TO NODE  11113.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3956.68  DOWNSTREAM(FEET) =   3752.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.35   CHANNEL SLOPE =  0.3066
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.469
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        9.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.91
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   1.88
  Tc(MIN.) =   10.43
  SUBAREA AREA(ACRES) =     9.55       SUBAREA RUNOFF(CFS) =   27.24
  EFFECTIVE AREA(ACRES) =     11.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       11.0         PEAK FLOW RATE(CFS) =      31.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =   7.11
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11113.00 =     995.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11113.00 TO NODE  11114.00 IS CODE =  56
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3752.68  DOWNSTREAM(FEET) =   3541.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   955.83   CHANNEL SLOPE =  0.2209
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.122
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       26.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.25
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   12.36
  SUBAREA AREA(ACRES) =    26.09       SUBAREA RUNOFF(CFS) =   66.26
  EFFECTIVE AREA(ACRES) =     37.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.1         PEAK FLOW RATE(CFS) =      94.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   9.39
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11114.00 =    1950.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11114.00 TO NODE  11115.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3541.57  DOWNSTREAM(FEET) =   3320.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.90   CHANNEL SLOPE =  0.1172
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.39
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.553
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       51.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     146.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.75
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   3.60
  Tc(MIN.) =   15.96
  SUBAREA AREA(ACRES) =    51.13       SUBAREA RUNOFF(CFS) =  103.68
  EFFECTIVE AREA(ACRES) =     88.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       88.3         PEAK FLOW RATE(CFS) =     178.96
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   9.35
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11115.00 =    3840.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11115.00 TO NODE  11116.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3320.00  DOWNSTREAM(FEET) =   3162.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.45   CHANNEL SLOPE =  0.0837
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.246
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     348.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.13
  AVERAGE FLOW DEPTH(FEET) =   2.35   TRAVEL TIME(MIN.) =   3.10
  Tc(MIN.) =   19.06
  SUBAREA AREA(ACRES) =   193.52       SUBAREA RUNOFF(CFS) =  338.97
  EFFECTIVE AREA(ACRES) =    281.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.8         PEAK FLOW RATE(CFS) =     493.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.82   FLOW VELOCITY(FEET/SEC.) =  11.19
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11116.00 =    5724.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11116.00 TO NODE  11117.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3162.36  DOWNSTREAM(FEET) =   3062.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.90   CHANNEL SLOPE =  0.0524
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.50
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.023
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.47      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     580.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.89
  AVERAGE FLOW DEPTH(FEET) =   3.47   TRAVEL TIME(MIN.) =   3.21
  Tc(MIN.) =   22.27
  SUBAREA AREA(ACRES) =   112.47       SUBAREA RUNOFF(CFS) =  174.39
  EFFECTIVE AREA(ACRES) =    394.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      394.2         PEAK FLOW RATE(CFS) =     611.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.56   FLOW VELOCITY(FEET/SEC.) =  10.03
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11117.00 =    7628.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1878.40   CHANNEL SLOPE =  0.0587
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.57
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.855
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     647.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.62
  AVERAGE FLOW DEPTH(FEET) =   3.56   TRAVEL TIME(MIN.) =   2.95
  Tc(MIN.) =   25.22
  SUBAREA AREA(ACRES) =    51.63       SUBAREA RUNOFF(CFS) =   72.28
  EFFECTIVE AREA(ACRES) =    445.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      445.9         PEAK FLOW RATE(CFS) =     624.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.50   FLOW VELOCITY(FEET/SEC.) =  10.50
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   25.22
 RAINFALL INTENSITY(INCH/HR) =   1.86
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     445.88
 TOTAL STREAM AREA(ACRES) =     445.88
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     624.19

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      728.43   26.27    1.803  0.30( 0.30) 1.00     538.3   11101.00
     2      624.19   25.22    1.855  0.30( 0.30) 1.00     445.9   11111.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1347.50   25.22    1.855  0.30( 0.30) 1.00     962.6   11111.00
     2     1331.76   26.27    1.803  0.30( 0.30) 1.00     984.2   11101.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1347.50    Tc(MIN.) =    25.22
 EFFECTIVE AREA(ACRES) =     962.57   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =      984.2
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11121.00 TO NODE  11122.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2952.48  DOWNSTREAM(FEET) =   2639.37
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2687.92   CHANNEL SLOPE =  0.1165
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.53
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.725
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      170.98      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1457.20
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.97
 AVERAGE FLOW DEPTH(FEET) =   4.51   TRAVEL TIME(MIN.) =   2.64
 Tc(MIN.) =   27.86
 SUBAREA AREA(ACRES) =   170.98       SUBAREA RUNOFF(CFS) =  219.37
 EFFECTIVE AREA(ACRES) =   1133.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1155.2         PEAK FLOW RATE(CFS) =    1454.33
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.51

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.51   FLOW VELOCITY(FEET/SEC.) =  16.98
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11122.00 =   12194.48 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1454.33   27.86    1.725  0.30( 0.30) 1.00    1133.5   11111.00
     2     1427.56   28.92    1.673  0.30( 0.30) 1.00    1155.2   11101.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1454.33  Tc(MIN.) =   27.86
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1133.55

****************************************************************************
 FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2639.37  DOWNSTREAM(FEET) =   1954.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3696.53   CHANNEL SLOPE =  0.1854
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.12
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.603
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      114.61      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1521.53
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.34
 AVERAGE FLOW DEPTH(FEET) =   4.11   TRAVEL TIME(MIN.) =   3.03
 Tc(MIN.) =   30.89
 SUBAREA AREA(ACRES) =   114.61       SUBAREA RUNOFF(CFS) =  134.39
 EFFECTIVE AREA(ACRES) =   1248.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1269.8         PEAK FLOW RATE(CFS) =    1463.59
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.03

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.03   FLOW VELOCITY(FEET/SEC.) =  20.14
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1463.59   30.89    1.603  0.30( 0.30) 1.00    1248.2   11111.00
     2     1465.00   31.97    1.582  0.30( 0.30) 1.00    1269.8   11101.00
```

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1465.00  Tc(MIN.) =   31.97
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1269.81

****************************************************************************
  FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.97
  RAINFALL INTENSITY(INCH/HR) =   1.58
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1269.81
  TOTAL STREAM AREA(ACRES) =    1269.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1465.00

****************************************************************************
  FLOW PROCESS FROM NODE  11130.00 TO NODE  11131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   259.85
  ELEVATION DATA: UPSTREAM(FEET) =   3923.93  DOWNSTREAM(FEET) =   3765.35

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.204
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.649
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.27      0.30     1.000     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.97
  TOTAL AREA(ACRES) =      1.27   PEAK FLOW RATE(CFS) =      4.97

****************************************************************************
  FLOW PROCESS FROM NODE  11131.00 TO NODE  11132.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3765.35  DOWNSTREAM(FEET) =   3414.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   674.05   CHANNEL SLOPE =  0.5200
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.969
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -        6.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.52
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   1.72
  Tc(MIN.) =    8.93
  SUBAREA AREA(ACRES) =     6.52       SUBAREA RUNOFF(CFS) =   21.53
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8          PEAK FLOW RATE(CFS) =      25.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =   7.82
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11132.00 =     933.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11132.00 TO NODE  11133.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3414.86  DOWNSTREAM(FEET) =   2699.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1813.44   CHANNEL SLOPE =  0.3945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.72
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.239
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.86
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   2.78
  Tc(MIN.) =   11.71
  SUBAREA AREA(ACRES) =    41.63       SUBAREA RUNOFF(CFS) =  110.11
  EFFECTIVE AREA(ACRES) =     49.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       49.4         PEAK FLOW RATE(CFS) =     130.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =  12.72
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11133.00 =    2747.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11133.00 TO NODE  11134.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2699.51  DOWNSTREAM(FEET) =   2464.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1053.33   CHANNEL SLOPE =  0.2235
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.009
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      142.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     305.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.74
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   1.28
  Tc(MIN.) =   12.99
  SUBAREA AREA(ACRES) =   142.85       SUBAREA RUNOFF(CFS) =  348.33
  EFFECTIVE AREA(ACRES) =    192.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      192.3         PEAK FLOW RATE(CFS) =     468.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.11   FLOW VELOCITY(FEET/SEC.) =  15.64
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11134.00 =    3800.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.06  DOWNSTREAM(FEET) =   1954.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1291.98   CHANNEL SLOPE =  0.3946
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.87
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.810
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.58      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     496.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.40
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   1.11
  Tc(MIN.) =   14.10
  SUBAREA AREA(ACRES) =    24.58       SUBAREA RUNOFF(CFS) =   55.53
  EFFECTIVE AREA(ACRES) =    216.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      216.9         PEAK FLOW RATE(CFS) =     489.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.85
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.85   FLOW VELOCITY(FEET/SEC.) =  19.34
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11141.00 =    5092.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.10
  RAINFALL INTENSITY(INCH/HR) =   2.81
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     216.85
  TOTAL STREAM AREA(ACRES) =     216.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     489.88

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1463.59   30.89    1.603  0.30( 0.30) 1.00    1248.2   11111.00
      1     1465.00   31.97    1.582  0.30( 0.30) 1.00    1269.8   11101.00
      2      489.88   14.10    2.810  0.30( 0.30) 1.00     216.9   11130.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1776.93   14.10    2.810  0.30( 0.30) 1.00     786.6   11130.00
      2     1717.86   30.89    1.603  0.30( 0.30) 1.00    1465.0   11111.00
      3     1715.18   31.97    1.582  0.30( 0.30) 1.00    1486.7   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1776.93    Tc(MIN.) =    14.10
  EFFECTIVE AREA(ACRES) =     786.58   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1486.7
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1486.7  TC(MIN.) =     14.10
  EFFECTIVE AREA(ACRES) =    786.58  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1776.93

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1776.93   14.10    2.810  0.30( 0.30) 1.00     786.6   11130.00
      2     1717.86   30.89    1.603  0.30( 0.30) 1.00    1465.0   11111.00
      3     1715.18   31.97    1.582  0.30( 0.30) 1.00    1486.7   11101.00
```

```
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S12.DAT
  TIME/DATE OF STUDY: 10:15 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.518
   2)   10.00;  3.546
   3)   15.00;  2.648
   4)   20.00;  2.153
   5)   25.00;  1.866
   6)   30.00;  1.620
   7)   40.00;  1.426
   8)   50.00;  1.269
   9)   60.00;  1.152
  10)   90.00;  0.988
  11)  120.00;  0.884
  12)  180.00;  0.752
  13)  360.00;  0.575
  14) 1440.00;  0.259
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11220.00 TO NODE  11221.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   762.39
  ELEVATION DATA: UPSTREAM(FEET) =   3797.72  DOWNSTREAM(FEET) =   3296.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.919
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.381
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        5.02      0.30     1.000     0   10.92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.92
  TOTAL AREA(ACRES) =      5.02   PEAK FLOW RATE(CFS) =     13.92

**************************************************************************
  FLOW PROCESS FROM NODE  11221.00 TO NODE  11223.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3296.86  DOWNSTREAM(FEET) =   2738.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   912.82   CHANNEL SLOPE =  0.6112
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.116
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       26.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.32
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   1.47
  Tc(MIN.) =   12.39
  SUBAREA AREA(ACRES) =    26.44       SUBAREA RUNOFF(CFS) =   67.02
  EFFECTIVE AREA(ACRES) =     31.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.5          PEAK FLOW RATE(CFS) =      79.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =  12.39
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11223.00 =    1675.21 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11223.00 TO NODE  11224.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2738.96  DOWNSTREAM(FEET) =   2370.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.79   CHANNEL SLOPE =  0.3843
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.910
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     176.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.94
  AVERAGE FLOW DEPTH(FEET) =   1.05   TRAVEL TIME(MIN.) =   1.15
  Tc(MIN.) =   13.54
  SUBAREA AREA(ACRES) =    82.44       SUBAREA RUNOFF(CFS) =  193.66
  EFFECTIVE AREA(ACRES) =    113.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.9         PEAK FLOW RATE(CFS) =     267.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.33   FLOW VELOCITY(FEET/SEC.) =  15.89
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11224.00 =    2635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2370.12  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.40   CHANNEL SLOPE =  0.2591
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.545
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     330.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.84
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   2.50
  Tc(MIN.) =   16.04
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =  125.15
  EFFECTIVE AREA(ACRES) =    175.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      175.8         PEAK FLOW RATE(CFS) =     355.32
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.74   FLOW VELOCITY(FEET/SEC.) =  15.19
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S11.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1776.93   14.10  0.30( 0.30) 1.00     786.6   11130.00
      2     1717.86   30.89  0.30( 0.30) 1.00    1465.0   11111.00
      3     1715.18   31.97  0.30( 0.30) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =     1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1776.93   14.10  0.30( 0.30) 1.00     786.6   11130.00
      2     1717.86   30.89  0.30( 0.30) 1.00    1465.0   11111.00
      3     1715.18   31.97  0.30( 0.30) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =      1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11231.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1954.20  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1435.64   CHANNEL SLOPE =  0.1116
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.17
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.605
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       89.78      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1870.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.86
  AVERAGE FLOW DEPTH(FEET) =   5.15   TRAVEL TIME(MIN.) =   1.34
  Tc(MIN.) =   15.44
  SUBAREA AREA(ACRES) =    89.78       SUBAREA RUNOFF(CFS) =  186.23
  EFFECTIVE AREA(ACRES) =    876.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1576.4          PEAK FLOW RATE(CFS) =    1817.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.09   FLOW VELOCITY(FEET/SEC.) =  17.72
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1817.82   15.44    2.605  0.30( 0.30) 1.00     876.4   11130.00
      2     1786.24   32.24    1.576  0.30( 0.30) 1.00    1554.8   11111.00
      3     1781.30   33.33    1.555  0.30( 0.30) 1.00    1576.4   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1817.82  Tc(MIN.) =   15.44
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =     876.36

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1817.82   15.44    2.605  0.30( 0.30) 1.00     876.4   11130.00
      2     1786.24   32.24    1.576  0.30( 0.30) 1.00    1554.8   11111.00
      3     1781.30   33.33    1.555  0.30( 0.30) 1.00    1576.4   11101.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      355.32   16.04    2.545  0.30( 0.30) 1.00     175.8   11220.00
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2168.90   15.44    2.605  0.30( 0.30) 1.00    1045.6   11130.00
      2     2172.02   16.04    2.545  0.30( 0.30) 1.00    1076.4   11220.00
      3     1988.24   32.24    1.576  0.30( 0.30) 1.00    1730.6   11111.00
      4     1979.97   33.33    1.555  0.30( 0.30) 1.00    1752.3   11101.00
    TOTAL AREA(ACRES) =      1752.3
```



```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2172.02  Tc(MIN.) =   16.037
  EFFECTIVE AREA(ACRES) =   1076.41  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1752.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.01  DOWNSTREAM(FEET) =   1680.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.84   CHANNEL SLOPE =  0.0585
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.56
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.328
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2226.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.71
  AVERAGE FLOW DEPTH(FEET) =   6.55   TRAVEL TIME(MIN.) =   2.19
  Tc(MIN.) =   18.23
  SUBAREA AREA(ACRES) =    59.78       SUBAREA RUNOFF(CFS) =  109.14
  EFFECTIVE AREA(ACRES) =   1136.19     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1812.1          PEAK FLOW RATE(CFS) =    2172.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.47   FLOW VELOCITY(FEET/SEC.) =  14.62
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2168.90   17.63    2.388  0.30( 0.30) 1.00    1105.4   11130.00
      2     2172.02   18.23    2.328  0.30( 0.30) 1.00    1136.2   11220.00
      3     1988.24   34.49    1.533  0.30( 0.30) 1.00    1790.4   11111.00
      4     1979.97   35.58    1.512  0.30( 0.30) 1.00    1812.1   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2172.02  Tc(MIN.) =   18.23
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1136.19

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.23
  RAINFALL INTENSITY(INCH/HR) =   2.33
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1136.19
  TOTAL STREAM AREA(ACRES) =    1812.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2172.02

****************************************************************************
  FLOW PROCESS FROM NODE  11201.00 TO NODE  11202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   986.34
  ELEVATION DATA: UPSTREAM(FEET) =   3383.22  DOWNSTREAM(FEET) =   3248.87

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.343
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.305
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                -        8.54      0.30     1.000     0   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     23.10
  TOTAL AREA(ACRES) =      8.54   PEAK FLOW RATE(CFS) =     23.10

****************************************************************************
  FLOW PROCESS FROM NODE  11202.00 TO NODE  11203.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3248.87  DOWNSTREAM(FEET) =   3198.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   922.69   CHANNEL SLOPE =  0.0550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.95
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.727
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.78
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   3.21
  Tc(MIN.) =   14.56
  SUBAREA AREA(ACRES) =    24.42       SUBAREA RUNOFF(CFS) =   53.35
  EFFECTIVE AREA(ACRES) =     32.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      72.01
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.09   FLOW VELOCITY(FEET/SEC.) =   5.40
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11203.00 =    1909.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11203.00 TO NODE  11204.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3198.08  DOWNSTREAM(FEET) =   3062.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1941.08   CHANNEL SLOPE =  0.0699
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.207
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       37.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     104.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.60
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =   4.90
  Tc(MIN.) =   19.46
  SUBAREA AREA(ACRES) =    37.67       SUBAREA RUNOFF(CFS) =   64.65
  EFFECTIVE AREA(ACRES) =     70.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =     121.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   6.91
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11204.00 =    3850.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11204.00 TO NODE  11205.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.48  DOWNSTREAM(FEET) =   2940.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.73   CHANNEL SLOPE =  0.0636
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.60
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.926
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED                -       34.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     146.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.09
  AVERAGE FLOW DEPTH(FEET) =   1.57   TRAVEL TIME(MIN.) =   4.51
  Tc(MIN.) =   23.96
  SUBAREA AREA(ACRES) =    34.87       SUBAREA RUNOFF(CFS) =   51.02
  EFFECTIVE AREA(ACRES) =    105.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      105.5          PEAK FLOW RATE(CFS) =     154.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =   7.23
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11205.00 =    5766.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11205.00 TO NODE  11206.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2940.56  DOWNSTREAM(FEET) =   2581.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2865.58   CHANNEL SLOPE =  0.1252
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.53
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.675
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       56.17      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     189.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.71
  AVERAGE FLOW DEPTH(FEET) =   1.50   TRAVEL TIME(MIN.) =   4.92
  Tc(MIN.) =   28.88
  SUBAREA AREA(ACRES) =    56.17       SUBAREA RUNOFF(CFS) =   69.52
  EFFECTIVE AREA(ACRES) =    161.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      161.7          PEAK FLOW RATE(CFS) =     200.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.55   FLOW VELOCITY(FEET/SEC.) =   9.89
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11206.00 =    8632.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11206.00 TO NODE  11207.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



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============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.93  DOWNSTREAM(FEET) =   2317.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1985.44   CHANNEL SLOPE =  0.1333
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.61
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.594
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      546.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     518.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.41
  AVERAGE FLOW DEPTH(FEET) =   2.56   TRAVEL TIME(MIN.) =   2.47
  Tc(MIN.) =   31.35
  SUBAREA AREA(ACRES) =   546.87       SUBAREA RUNOFF(CFS) =  636.85
  EFFECTIVE AREA(ACRES) =    708.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      708.5          PEAK FLOW RATE(CFS) =     825.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.27   FLOW VELOCITY(FEET/SEC.) =  15.27
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11207.00 =   10617.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2317.20  DOWNSTREAM(FEET) =   1680.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4085.95   CHANNEL SLOPE =  0.1557
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.56
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.517
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      389.75      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1038.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.21
  AVERAGE FLOW DEPTH(FEET) =   3.54   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   35.30
  SUBAREA AREA(ACRES) =   389.75       SUBAREA RUNOFF(CFS) =  426.95
  EFFECTIVE AREA(ACRES) =   1098.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1098.3          PEAK FLOW RATE(CFS) =    1203.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.81
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.81   FLOW VELOCITY(FEET/SEC.) =  17.92
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11241.00 =   14703.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   35.30
  RAINFALL INTENSITY(INCH/HR) =   1.52
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1098.29
  TOTAL STREAM AREA(ACRES) =    1098.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1203.12

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2168.90   17.63    2.388  0.30( 0.30) 1.00    1105.4   11130.00
      1     2172.02   18.23    2.328  0.30( 0.30) 1.00    1136.2   11220.00
      1     1988.24   34.49    1.533  0.30( 0.30) 1.00    1790.4   11111.00
      1     1979.97   35.58    1.512  0.30( 0.30) 1.00    1812.1   11101.00
      2     1203.12   35.30    1.517  0.30( 0.30) 1.00    1098.3   11201.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3199.40   17.63    2.388  0.30( 0.30) 1.00    1653.8   11130.00
      2     3207.27   18.23    2.328  0.30( 0.30) 1.00    1703.2   11220.00
      3     3178.91   34.49    1.533  0.30( 0.30) 1.00    2863.4   11111.00
      4     3185.17   35.30    1.517  0.30( 0.30) 1.00    2904.9   11201.00
      5     3177.87   35.58    1.512  0.30( 0.30) 1.00    2910.3   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    3207.27    Tc(MIN.) =    18.23
  EFFECTIVE AREA(ACRES) =    1703.24   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2910.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11241.00 TO NODE  11242.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1680.94  DOWNSTREAM(FEET) =   1521.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1795.61   CHANNEL SLOPE =  0.0890
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.24
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.174
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      198.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3374.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.15
  AVERAGE FLOW DEPTH(FEET) =   7.21   TRAVEL TIME(MIN.) =   1.56
  Tc(MIN.) =   19.79
  SUBAREA AREA(ACRES) =   198.62       SUBAREA RUNOFF(CFS) =  334.95
  EFFECTIVE AREA(ACRES) =   1901.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3109.0          PEAK FLOW RATE(CFS) =    3207.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.05   FLOW VELOCITY(FEET/SEC.) =  18.89
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11242.00 =   21056.10 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3222.65   19.19    2.233  0.30( 0.30) 1.00    1852.4   11130.00
      2     3207.29   19.79    2.174  0.30( 0.30) 1.00    1901.9   11220.00
      3     3313.54   36.07    1.502  0.30( 0.30) 1.00    3062.0   11111.00
      4     3314.51   36.88    1.487  0.30( 0.30) 1.00    3103.5   11201.00
      5     3305.46   37.15    1.481  0.30( 0.30) 1.00    3109.0   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3314.51  Tc(MIN.) =   36.88
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3103.52

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1521.21  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.33   CHANNEL SLOPE =  0.0797
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.40
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.447
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       95.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3363.76
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.37
  AVERAGE FLOW DEPTH(FEET) =   7.39   TRAVEL TIME(MIN.) =   2.02
  Tc(MIN.) =   38.89
  SUBAREA AREA(ACRES) =    95.39       SUBAREA RUNOFF(CFS) =   98.52
  EFFECTIVE AREA(ACRES) =   3198.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3204.3         PEAK FLOW RATE(CFS) =    3314.51
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.34   FLOW VELOCITY(FEET/SEC.) =  18.29
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3222.65   21.22    2.083  0.30( 0.30) 1.00    1947.8   11130.00
      2     3207.29   21.82    2.048  0.30( 0.30) 1.00    1997.3   11220.00
      3     3313.54   38.08    1.463  0.30( 0.30) 1.00    3157.4   11111.00
      4     3314.51   38.89    1.447  0.30( 0.30) 1.00    3198.9   11201.00
      5     3305.46   39.17    1.442  0.30( 0.30) 1.00    3204.3   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3314.51  Tc(MIN.) =   38.89
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3198.91

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   38.89
  RAINFALL INTENSITY(INCH/HR) =   1.45
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3198.91
  TOTAL STREAM AREA(ACRES) =    3204.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    3314.51

****************************************************************************
  FLOW PROCESS FROM NODE  11250.00 TO NODE  11251.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   982.50
  ELEVATION DATA: UPSTREAM(FEET) =   3806.44  DOWNSTREAM(FEET) =   3168.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.112
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.167
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.91      0.30     1.000      0   12.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     15.25
  TOTAL AREA(ACRES) =      5.91   PEAK FLOW RATE(CFS) =     15.25

****************************************************************************
  FLOW PROCESS FROM NODE  11251.00 TO NODE  11252.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3168.25  DOWNSTREAM(FEET) =   2683.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.5240
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.836
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.73      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.37
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   13.96
  SUBAREA AREA(ACRES) =    13.73       SUBAREA RUNOFF(CFS) =   31.33
  EFFECTIVE AREA(ACRES) =     19.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       19.6         PEAK FLOW RATE(CFS) =      44.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   9.60
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11252.00 =    1908.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11252.00 TO NODE  11253.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2683.24  DOWNSTREAM(FEET) =   2334.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.66   CHANNEL SLOPE =  0.3694
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.616
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -       55.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     102.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.49
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   1.37
  Tc(MIN.) =   15.33
  SUBAREA AREA(ACRES) =    55.67       SUBAREA RUNOFF(CFS) =  116.03
  EFFECTIVE AREA(ACRES) =     75.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       75.3         PEAK FLOW RATE(CFS) =     156.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =  13.25
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11253.00 =    2852.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11253.00 TO NODE  11254.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2334.26  DOWNSTREAM(FEET) =   1768.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2293.59   CHANNEL SLOPE =  0.2468
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.69
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.351
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     310.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.28
  AVERAGE FLOW DEPTH(FEET) =   1.64   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   18.00
  SUBAREA AREA(ACRES) =   165.43       SUBAREA RUNOFF(CFS) =  305.35
  EFFECTIVE AREA(ACRES) =    240.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      240.7         PEAK FLOW RATE(CFS) =     444.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.99   FLOW VELOCITY(FEET/SEC.) =  15.93
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11254.00 =    5146.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11254.00 TO NODE  11255.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1768.11  DOWNSTREAM(FEET) =   1506.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.59   CHANNEL SLOPE =  0.1376
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.80
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.139
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     605.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.16
  AVERAGE FLOW DEPTH(FEET) =   2.76   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   20.24
  SUBAREA AREA(ACRES) =   194.55       SUBAREA RUNOFF(CFS) =  322.09
  EFFECTIVE AREA(ACRES) =    435.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      435.3         PEAK FLOW RATE(CFS) =     720.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.02   FLOW VELOCITY(FEET/SEC.) =  14.89
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11255.00 =    7043.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.97  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =   882.10   CHANNEL SLOPE =  0.1848
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.02
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.091
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      137.86      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     831.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.24
  AVERAGE FLOW DEPTH(FEET) =   3.01   TRAVEL TIME(MIN.) =   0.85
  Tc(MIN.) =   21.09
  SUBAREA AREA(ACRES) =   137.86       SUBAREA RUNOFF(CFS) =  222.17
  EFFECTIVE AREA(ACRES) =    573.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      573.1         PEAK FLOW RATE(CFS) =     923.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.18
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.18   FLOW VELOCITY(FEET/SEC.) =  17.72
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11261.00 =    7926.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.09
  RAINFALL INTENSITY(INCH/HR) =   2.09
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     573.15
  TOTAL STREAM AREA(ACRES) =     573.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     923.65

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3222.65   21.22    2.083  0.30( 0.30) 1.00    1947.8   11130.00
      1     3207.29   21.82    2.048  0.30( 0.30) 1.00    1997.3   11220.00
      1     3313.54   38.08    1.463  0.30( 0.30) 1.00    3157.4   11111.00
      1     3314.51   38.89    1.447  0.30( 0.30) 1.00    3198.9   11201.00
      1     3305.46   39.17    1.442  0.30( 0.30) 1.00    3204.3   11101.00
      2      923.65   21.09    2.091  0.30( 0.30) 1.00     573.1   11250.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4139.81   21.09    2.091  0.30( 0.30) 1.00    2508.7   11250.00
      2     4142.36   21.22    2.083  0.30( 0.30) 1.00    2521.0   11130.00
      3     4109.25   21.82    2.048  0.30( 0.30) 1.00    2570.4   11220.00
      4     3913.58   38.08    1.463  0.30( 0.30) 1.00    3730.6   11111.00
      5     3906.43   38.89    1.447  0.30( 0.30) 1.00    3772.1   11201.00
      6     3894.63   39.17    1.442  0.30( 0.30) 1.00    3777.5   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    4142.36    Tc(MIN.) =    21.22
  EFFECTIVE AREA(ACRES) =    2520.97   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3777.5
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   1343.95  DOWNSTREAM(FEET) =   1299.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =   889.38   CHANNEL SLOPE =  0.0503
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.10
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.031
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.65      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4204.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.39
  AVERAGE FLOW DEPTH(FEET) =   9.10   TRAVEL TIME(MIN.) =   0.90
  Tc(MIN.) =   22.13
  SUBAREA AREA(ACRES) =    79.65       SUBAREA RUNOFF(CFS) =  124.09
  EFFECTIVE AREA(ACRES) =   2600.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3857.1          PEAK FLOW RATE(CFS) =    4142.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.04   FLOW VELOCITY(FEET/SEC.) =  16.32
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11310.00 =   24168.81 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4139.81   21.99    2.039  0.30( 0.30) 1.00    2588.4   11250.00
      2     4142.36   22.13    2.031  0.30( 0.30) 1.00    2600.6   11130.00
      3     4109.25   22.73    1.996  0.30( 0.30) 1.00    2650.1   11220.00
      4     3927.80   39.00    1.445  0.30( 0.30) 1.00    3810.2   11111.00
      5     3916.03   39.81    1.430  0.30( 0.30) 1.00    3851.7   11201.00
      6     3904.14   40.09    1.425  0.30( 0.30) 1.00    3857.1   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    4142.36  Tc(MIN.) =   22.13
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2600.62
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     3857.1  TC(MIN.) =     22.13
  EFFECTIVE AREA(ACRES) =   2600.62  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    4142.36

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4139.81   21.99    2.039  0.30( 0.30) 1.00    2588.4   11250.00
      2     4142.36   22.13    2.031  0.30( 0.30) 1.00    2600.6   11130.00
      3     4109.25   22.73    1.996  0.30( 0.30) 1.00    2650.1   11220.00
      4     3927.80   39.00    1.445  0.30( 0.30) 1.00    3810.2   11111.00
      5     3916.03   39.81    1.430  0.30( 0.30) 1.00    3851.7   11201.00
      6     3904.14   40.09    1.425  0.30( 0.30) 1.00    3857.1   11101.00
```

```
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S13.DAT
  TIME/DATE OF STUDY: 10:16 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.518
   2)   10.00;  3.546
   3)   15.00;  2.648
   4)   20.00;  2.153
   5)   25.00;  1.866
   6)   30.00;  1.620
   7)   40.00;  1.426
   8)   50.00;  1.269
   9)   60.00;  1.152
  10)   90.00;  0.988
  11)  120.00;  0.884
  12)  180.00;  0.752
  13)  360.00;  0.575
  14) 1440.00;  0.259
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11300.00 TO NODE  11301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   455.90
  ELEVATION DATA: UPSTREAM(FEET) =   3394.67  DOWNSTREAM(FEET) =   3247.06

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.240
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.503
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.53      0.30     1.000     0   10.24
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.29
  TOTAL AREA(ACRES) =      2.53   PEAK FLOW RATE(CFS) =      7.29

**************************************************************************
  FLOW PROCESS FROM NODE  11301.00 TO NODE  11301.50 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3247.06  DOWNSTREAM(FEET) =   3150.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   468.69   CHANNEL SLOPE =  0.2059
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.247
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.48
  AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   1.43
  Tc(MIN.) =   11.67
  SUBAREA AREA(ACRES) =    10.95       SUBAREA RUNOFF(CFS) =   29.04
  EFFECTIVE AREA(ACRES) =     13.48     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.5          PEAK FLOW RATE(CFS) =      35.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   6.60
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11301.50 =     924.59 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11301.50 TO NODE  11302.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3150.57  DOWNSTREAM(FEET) =   2840.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =   982.20   CHANNEL SLOPE =  0.3162
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.892
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.28
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   1.98
  Tc(MIN.) =   13.64
  SUBAREA AREA(ACRES) =     9.59       SUBAREA RUNOFF(CFS) =   22.37
  EFFECTIVE AREA(ACRES) =     23.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.1         PEAK FLOW RATE(CFS) =      53.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   8.74
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11302.00 =    1906.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11302.00 TO NODE  11303.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2840.04  DOWNSTREAM(FEET) =   2177.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.03   CHANNEL SLOPE =  0.3460
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.527
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     138.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.39
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   2.58
  Tc(MIN.) =   16.22
  SUBAREA AREA(ACRES) =    84.31       SUBAREA RUNOFF(CFS) =  169.01
  EFFECTIVE AREA(ACRES) =    107.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.4         PEAK FLOW RATE(CFS) =     215.26
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.21   FLOW VELOCITY(FEET/SEC.) =  14.32
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11303.00 =    3822.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11303.00 TO NODE  11304.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2177.16  DOWNSTREAM(FEET) =   1612.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2472.34   CHANNEL SLOPE =  0.2285
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.232
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       99.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     302.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.82
  AVERAGE FLOW DEPTH(FEET) =   1.65   TRAVEL TIME(MIN.) =   2.98
  Tc(MIN.) =   19.20
  SUBAREA AREA(ACRES) =    99.61       SUBAREA RUNOFF(CFS) =  173.21
  EFFECTIVE AREA(ACRES) =    206.99     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.0         PEAK FLOW RATE(CFS) =     359.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =  14.57
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11304.00 =    6295.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1612.27  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2432.96   CHANNEL SLOPE =  0.1604
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.14
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.024
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.86      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     401.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.28
  AVERAGE FLOW DEPTH(FEET) =   2.12   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   22.26
  SUBAREA AREA(ACRES) =    53.86       SUBAREA RUNOFF(CFS) =   83.55
  EFFECTIVE AREA(ACRES) =    260.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      260.8          PEAK FLOW RATE(CFS) =     404.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.13   FLOW VELOCITY(FEET/SEC.) =  13.31
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S12.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     4139.81   21.99  0.30( 0.30) 1.00    2588.4   11250.00
      2     4142.36   22.13  0.30( 0.30) 1.00    2600.6   11130.00
      3     4109.25   22.73  0.30( 0.30) 1.00    2650.1   11220.00
      4     3927.80   39.00  0.30( 0.30) 1.00    3810.2   11111.00
      5     3916.03   39.81  0.30( 0.30) 1.00    3851.7   11201.00
      6     3904.14   40.09  0.30( 0.30) 1.00    3857.1   11101.00
    TOTAL AREA(ACRES) =     3857.1

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     4139.81   21.99  0.30( 0.30) 1.00    2588.4   11250.00
      2     4142.36   22.13  0.30( 0.30) 1.00    2600.6   11130.00
      3     4109.25   22.73  0.30( 0.30) 1.00    2650.1   11220.00
      4     3927.80   39.00  0.30( 0.30) 1.00    3810.2   11111.00
      5     3916.03   39.81  0.30( 0.30) 1.00    3851.7   11201.00
      6     3904.14   40.09  0.30( 0.30) 1.00    3857.1   11101.00
    TOTAL AREA(ACRES) =     3857.1
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11310.00 TO NODE  11320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1299.17  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1694.05   CHANNEL SLOPE =  0.0455
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.31
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.928
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4203.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.77
  AVERAGE FLOW DEPTH(FEET) =   9.31   TRAVEL TIME(MIN.) =   1.79
  Tc(MIN.) =   23.92
  SUBAREA AREA(ACRES) =    83.22       SUBAREA RUNOFF(CFS) =  121.95
  EFFECTIVE AREA(ACRES) =   2683.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3940.4          PEAK FLOW RATE(CFS) =    4142.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.25   FLOW VELOCITY(FEET/SEC.) =  15.71
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4139.81   23.78    1.936  0.30( 0.30) 1.00    2671.6   11250.00
      2     4142.36   23.92    1.928  0.30( 0.30) 1.00    2683.8   11130.00
      3     4109.25   24.52    1.894  0.30( 0.30) 1.00    2733.3   11220.00
      4     3927.80   40.82    1.413  0.30( 0.30) 1.00    3893.5   11111.00
      5     3916.03   41.63    1.400  0.30( 0.30) 1.00    3934.9   11201.00
      6     3904.14   41.91    1.396  0.30( 0.30) 1.00    3940.4   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    4142.36  Tc(MIN.) =   23.92
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2683.84

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
     1     4139.81   23.78    1.936  0.30( 0.30) 1.00    2671.6   11250.00
     2     4142.36   23.92    1.928  0.30( 0.30) 1.00    2683.8   11130.00
     3     4109.25   24.52    1.894  0.30( 0.30) 1.00    2733.3   11220.00
     4     3927.80   40.82    1.413  0.30( 0.30) 1.00    3893.5   11111.00
     5     3916.03   41.63    1.400  0.30( 0.30) 1.00    3934.9   11201.00
     6     3904.14   41.91    1.396  0.30( 0.30) 1.00    3940.4   11101.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      404.63   22.26    2.024  0.30( 0.30) 1.00     260.8   11300.00
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4486.23   22.26    2.024  0.30( 0.30) 1.00    2761.0   11300.00
      2     4523.88   23.78    1.936  0.30( 0.30) 1.00    2932.5   11250.00
      3     4524.62   23.92    1.928  0.30( 0.30) 1.00    2944.7   11130.00
      4     4483.37   24.52    1.894  0.30( 0.30) 1.00    2994.1   11220.00
      5     4189.14   40.82    1.413  0.30( 0.30) 1.00    4154.3   11111.00
      6     4174.38   41.63    1.400  0.30( 0.30) 1.00    4195.8   11201.00
      7     4161.46   41.91    1.396  0.30( 0.30) 1.00    4201.2   11101.00
    TOTAL AREA(ACRES) =      4201.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4524.62  Tc(MIN.) =   23.916
  EFFECTIVE AREA(ACRES) =   2944.69  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     4201.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1222.10  DOWNSTREAM(FEET) =   1092.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3157.19   CHANNEL SLOPE =  0.0410
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.09
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.754
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4739.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.65
  AVERAGE FLOW DEPTH(FEET) =  10.06   TRAVEL TIME(MIN.) =   3.36
  Tc(MIN.) =   27.28
  SUBAREA AREA(ACRES) =   328.55       SUBAREA RUNOFF(CFS) =  429.92
  EFFECTIVE AREA(ACRES) =   3273.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
  TOTAL AREA(ACRES) =     4529.8         PEAK FLOW RATE(CFS) =    4524.62
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.85   FLOW VELOCITY(FEET/SEC.) =  15.46
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4486.23   25.62    1.835  0.30( 0.30) 1.00    3089.5   11300.00
      2     4523.88   27.15    1.760  0.30( 0.30) 1.00    3261.0   11250.00
      3     4524.62   27.28    1.754  0.30( 0.30) 1.00    3273.2   11130.00
      4     4483.37   27.89    1.724  0.30( 0.30) 1.00    3322.7   11220.00
      5     4273.57   44.26    1.359  0.30( 0.30) 1.00    4482.9   11111.00
      6     4260.98   45.07    1.346  0.30( 0.30) 1.00    4524.3   11201.00
      7     4248.24   45.35    1.342  0.30( 0.30) 1.00    4529.8   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    4524.62  Tc(MIN.) =   27.28
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3273.24

****************************************************************************
  FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.28
  RAINFALL INTENSITY(INCH/HR) =   1.75
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3273.24
  TOTAL STREAM AREA(ACRES) =    4529.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    4524.62

****************************************************************************
  FLOW PROCESS FROM NODE  11330.00 TO NODE  11331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.83
  ELEVATION DATA: UPSTREAM(FEET) =   3270.16  DOWNSTREAM(FEET) =   3123.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.975
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.345
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.69      0.30     1.000     0    7.98
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.15
  TOTAL AREA(ACRES) =      1.69   PEAK FLOW RATE(CFS) =      6.15

****************************************************************************
  FLOW PROCESS FROM NODE  11331.00 TO NODE  11332.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3123.64  DOWNSTREAM(FEET) =   2903.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   710.41   CHANNEL SLOPE =  0.3104
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.517
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.42
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   2.18
  Tc(MIN.) =   10.16
  SUBAREA AREA(ACRES) =     5.82       SUBAREA RUNOFF(CFS) =   16.85
  EFFECTIVE AREA(ACRES) =      7.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.5         PEAK FLOW RATE(CFS) =      21.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   6.28
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11332.00 =    1010.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11332.00 TO NODE  11333.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.10  DOWNSTREAM(FEET) =   2718.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   843.93   CHANNEL SLOPE =  0.2183
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.131
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.10
```



```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.54
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   12.31
  SUBAREA AREA(ACRES) =     9.66       SUBAREA RUNOFF(CFS) =   24.62
  EFFECTIVE AREA(ACRES) =     17.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.2         PEAK FLOW RATE(CFS) =      43.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   7.22
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11333.00 =    1854.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11333.00 TO NODE  11334.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2718.89  DOWNSTREAM(FEET) =   2364.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1084.60   CHANNEL SLOPE =  0.3264
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.770
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.98
  AVERAGE FLOW DEPTH(FEET) =   0.57   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =   14.32
  SUBAREA AREA(ACRES) =    11.67       SUBAREA RUNOFF(CFS) =   25.94
  EFFECTIVE AREA(ACRES) =     28.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.8         PEAK FLOW RATE(CFS) =      64.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   9.31
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11334.00 =    2938.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11334.00 TO NODE  11335.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2364.84  DOWNSTREAM(FEET) =   1729.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.08   CHANNEL SLOPE =  0.3237
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

```
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   1.11
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.463
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -      102.74      0.30     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     164.39
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.83
AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   2.55
Tc(MIN.) =   16.87
SUBAREA AREA(ACRES) =   102.74       SUBAREA RUNOFF(CFS) =  199.98
EFFECTIVE AREA(ACRES) =    131.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =      131.6         PEAK FLOW RATE(CFS) =     256.12
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   1.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =  14.79
LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11335.00 =    4901.85 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1729.46  DOWNSTREAM(FEET) =   1092.58
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2702.07   CHANNEL SLOPE =  0.2357
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.75
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.152
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -       90.38      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     331.62
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.35
 AVERAGE FLOW DEPTH(FEET) =   1.72   TRAVEL TIME(MIN.) =   3.14
 Tc(MIN.) =   20.01
 SUBAREA AREA(ACRES) =    90.38       SUBAREA RUNOFF(CFS) =  150.69
 EFFECTIVE AREA(ACRES) =    221.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      222.0         PEAK FLOW RATE(CFS) =     370.07
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.83

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =  14.84
 LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11340.00 =    7603.92 FEET.
```



```
****************************************************************************
 FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   20.01
 RAINFALL INTENSITY(INCH/HR) =   2.15
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     221.96
 TOTAL STREAM AREA(ACRES) =     221.96
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     370.07

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4486.23   25.62    1.835  0.30( 0.30) 1.00    3089.5   11300.00
     1     4523.88   27.15    1.760  0.30( 0.30) 1.00    3261.0   11250.00
     1     4524.62   27.28    1.754  0.30( 0.30) 1.00    3273.2   11130.00
     1     4483.37   27.89    1.724  0.30( 0.30) 1.00    3322.7   11220.00
     1     4273.57   44.26    1.359  0.30( 0.30) 1.00    4482.9   11111.00
     1     4260.98   45.07    1.346  0.30( 0.30) 1.00    4524.3   11201.00
     1     4248.24   45.35    1.342  0.30( 0.30) 1.00    4529.8   11101.00
     2      370.07   20.01    2.152  0.30( 0.30) 1.00     222.0   11330.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4597.04   20.01    2.152  0.30( 0.30) 1.00    2634.8   11330.00
     2     4792.96   25.62    1.835  0.30( 0.30) 1.00    3311.5   11300.00
     3     4815.64   27.15    1.760  0.30( 0.30) 1.00    3483.0   11250.00
     4     4815.07   27.28    1.754  0.30( 0.30) 1.00    3495.2   11130.00
     5     4767.79   27.89    1.724  0.30( 0.30) 1.00    3544.6   11220.00
     6     4485.17   44.26    1.359  0.30( 0.30) 1.00    4704.8   11111.00
     7     4470.02   45.07    1.346  0.30( 0.30) 1.00    4746.3   11201.00
     8     4456.41   45.35    1.342  0.30( 0.30) 1.00    4751.7   11101.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    4815.64    Tc(MIN.) =    27.15
 EFFECTIVE AREA(ACRES) =    3482.98   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4751.7
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11340.00 TO NODE  11341.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1092.58  DOWNSTREAM(FEET) =   1055.49
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.69   CHANNEL SLOPE =  0.0259
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.26
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.672
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       54.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4849.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.25
 AVERAGE FLOW DEPTH(FEET) =  11.26   TRAVEL TIME(MIN.) =   1.80
 Tc(MIN.) =   28.95
 SUBAREA AREA(ACRES) =    54.55       SUBAREA RUNOFF(CFS) =   67.35
 EFFECTIVE AREA(ACRES) =   3537.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     4806.3         PEAK FLOW RATE(CFS) =    4815.64
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.22

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 11.22   FLOW VELOCITY(FEET/SEC.) =  13.23
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11341.00 =   30452.74 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4597.04   21.83    2.048  0.30( 0.30) 1.00    2689.3   11330.00
     2     4792.96   27.43    1.747  0.30( 0.30) 1.00    3366.1   11300.00
     3     4815.64   28.95    1.672  0.30( 0.30) 1.00    3537.5   11250.00
     4     4815.07   29.08    1.665  0.30( 0.30) 1.00    3549.7   11130.00
     5     4767.79   29.70    1.635  0.30( 0.30) 1.00    3599.2   11220.00
     6     4485.17   46.09    1.330  0.30( 0.30) 1.00    4759.4   11111.00
     7     4470.02   46.91    1.318  0.30( 0.30) 1.00    4800.8   11201.00
     8     4456.41   47.19    1.313  0.30( 0.30) 1.00    4806.3   11101.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    4815.64  Tc(MIN.) =   28.95
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3537.53

****************************************************************************
 FLOW PROCESS FROM NODE  11341.00 TO NODE  11342.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1055.49  DOWNSTREAM(FEET) =   1017.16
 CHANNEL LENGTH THRU SUBAREA(FEET) =   943.89   CHANNEL SLOPE =  0.0406
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.23
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.623
 SUBAREA LOSS RATE DATA(AMC  II):
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  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      119.96      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4887.04
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.71
 AVERAGE FLOW DEPTH(FEET) =  10.22   TRAVEL TIME(MIN.) =   1.00
 Tc(MIN.) =   29.95
 SUBAREA AREA(ACRES) =   119.96       SUBAREA RUNOFF(CFS) =  142.79
 EFFECTIVE AREA(ACRES) =   3657.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     4926.2         PEAK FLOW RATE(CFS) =    4815.64
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.15

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.15   FLOW VELOCITY(FEET/SEC.) =  15.65
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11342.00 =   31396.63 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4597.04   22.84    1.990  0.30( 0.30) 1.00    2809.3   11330.00
     2     4792.96   28.43    1.697  0.30( 0.30) 1.00    3486.0   11300.00
     3     4815.64   29.95    1.623  0.30( 0.30) 1.00    3657.5   11250.00
     4     4815.07   30.08    1.618  0.30( 0.30) 1.00    3669.7   11130.00
     5     4767.79   30.70    1.606  0.30( 0.30) 1.00    3719.1   11220.00
     6     4485.17   47.11    1.314  0.30( 0.30) 1.00    4879.3   11111.00
     7     4470.02   47.93    1.301  0.30( 0.30) 1.00    4920.8   11201.00
     8     4456.41   48.21    1.297  0.30( 0.30) 1.00    4926.2   11101.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    4815.64  Tc(MIN.) =   29.95
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3657.49

****************************************************************************
 FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1017.16  DOWNSTREAM(FEET) =    957.53
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1557.63   CHANNEL SLOPE =  0.0383
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.34
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.588
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       85.25      0.30     0.990     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4865.17
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.35
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 AVERAGE FLOW DEPTH(FEET) =  10.33   TRAVEL TIME(MIN.) =   1.69
 Tc(MIN.) =   31.64
 SUBAREA AREA(ACRES) =    85.25       SUBAREA RUNOFF(CFS) =   99.07
 EFFECTIVE AREA(ACRES) =   3742.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     5011.5         PEAK FLOW RATE(CFS) =    4815.64
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.29

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.29   FLOW VELOCITY(FEET/SEC.) =  15.31
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4597.04   24.55    1.892  0.30( 0.30) 1.00    2894.5   11330.00
     2     4792.96   30.12    1.618  0.30( 0.30) 1.00    3571.3   11300.00
     3     4815.64   31.64    1.588  0.30( 0.30) 1.00    3742.7   11250.00
     4     4815.07   31.77    1.586  0.30( 0.30) 1.00    3755.0   11130.00
     5     4767.79   32.40    1.573  0.30( 0.30) 1.00    3804.4   11220.00
     6     4485.17   48.84    1.287  0.30( 0.30) 1.00    4964.6   11111.00
     7     4470.02   49.66    1.274  0.30( 0.30) 1.00    5006.0   11201.00
     8     4456.41   49.94    1.270  0.30( 0.30) 1.00    5011.5   11101.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    4815.64  Tc(MIN.) =   31.64
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3742.74

****************************************************************************
 FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   31.64
 RAINFALL INTENSITY(INCH/HR) =   1.59
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    3742.74
 TOTAL STREAM AREA(ACRES) =    5011.49
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    4815.64

****************************************************************************
 FLOW PROCESS FROM NODE  11350.00 TO NODE  11351.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.54
 ELEVATION DATA: UPSTREAM(FEET) =   2805.98  DOWNSTREAM(FEET) =   2583.16

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.655
```



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 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.710
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        5.40      0.30     1.000     0   14.66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     11.71
 TOTAL AREA(ACRES) =      5.40   PEAK FLOW RATE(CFS) =     11.71

****************************************************************************
 FLOW PROCESS FROM NODE  11351.00 TO NODE  11352.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2583.16  DOWNSTREAM(FEET) =   2403.73
 CHANNEL LENGTH THRU SUBAREA(FEET) =   956.57   CHANNEL SLOPE =  0.1876
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.408
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       15.56      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.76
 AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   2.77
 Tc(MIN.) =   17.42
 SUBAREA AREA(ACRES) =    15.56       SUBAREA RUNOFF(CFS) =   29.52
 EFFECTIVE AREA(ACRES) =     20.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       21.0         PEAK FLOW RATE(CFS) =      39.77
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   6.59
 LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11352.00 =    1907.11 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11352.00 TO NODE  11353.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2403.73  DOWNSTREAM(FEET) =   1786.74
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.85   CHANNEL SLOPE =  0.3190
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.131
 SUBAREA LOSS RATE DATA(AMC  II):
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```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       74.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     100.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.90
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   20.38
  SUBAREA AREA(ACRES) =    74.05       SUBAREA RUNOFF(CFS) =  122.04
  EFFECTIVE AREA(ACRES) =     95.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       95.0         PEAK FLOW RATE(CFS) =     156.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =  12.57
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11353.00 =    3840.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11353.00 TO NODE  11354.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1786.74  DOWNSTREAM(FEET) =   1308.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2073.35   CHANNEL SLOPE =  0.2307
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.965
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     187.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.93
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =   2.90
  Tc(MIN.) =   23.28
  SUBAREA AREA(ACRES) =    41.22       SUBAREA RUNOFF(CFS) =   61.77
  EFFECTIVE AREA(ACRES) =    136.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      136.2         PEAK FLOW RATE(CFS) =     204.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =  12.27
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11354.00 =    5914.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =  56
----------------------------------------------------------------------------
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```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.39  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2455.49   CHANNEL SLOPE =  0.1429
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.05
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.785
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      201.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     339.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.14
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   26.65
  SUBAREA AREA(ACRES) =   201.53       SUBAREA RUNOFF(CFS) =  269.34
  EFFECTIVE AREA(ACRES) =    337.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      337.8         PEAK FLOW RATE(CFS) =     451.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.33   FLOW VELOCITY(FEET/SEC.) =  13.20
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11360.00 =    8369.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.65
  RAINFALL INTENSITY(INCH/HR) =   1.78
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     337.76
  TOTAL STREAM AREA(ACRES) =     337.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     451.41

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4597.04   24.55    1.892  0.30( 0.30) 1.00    2894.5   11330.00
      1     4792.96   30.12    1.618  0.30( 0.30) 1.00    3571.3   11300.00
      1     4815.64   31.64    1.588  0.30( 0.30) 1.00    3742.7   11250.00
      1     4815.07   31.77    1.586  0.30( 0.30) 1.00    3755.0   11130.00
      1     4767.79   32.40    1.573  0.30( 0.30) 1.00    3804.4   11220.00
      1     4485.17   48.84    1.287  0.30( 0.30) 1.00    4964.6   11111.00
      1     4470.02   49.66    1.274  0.30( 0.30) 1.00    5006.0   11201.00
```

```
     1     4456.41   49.94    1.270  0.30( 0.30) 1.00    5011.5   11101.00
     2      451.41   26.65    1.785  0.30( 0.30) 1.00     337.8   11350.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5042.85   24.55    1.892  0.30( 0.30) 1.00    3205.7   11330.00
      2     5122.19   26.65    1.785  0.30( 0.30) 1.00    3487.0   11350.00
      3     5193.53   30.12    1.618  0.30( 0.30) 1.00    3909.0   11300.00
      4     5207.25   31.64    1.588  0.30( 0.30) 1.00    4080.5   11250.00
      5     5205.88   31.77    1.586  0.30( 0.30) 1.00    4092.7   11130.00
      6     5154.93   32.40    1.573  0.30( 0.30) 1.00    4142.2   11220.00
      7     4785.31   48.84    1.287  0.30( 0.30) 1.00    5302.3   11111.00
      8     4766.24   49.66    1.274  0.30( 0.30) 1.00    5343.8   11201.00
      9     4751.29   49.94    1.270  0.30( 0.30) 1.00    5349.2   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    5207.25    Tc(MIN.) =    31.64
  EFFECTIVE AREA(ACRES) =    4080.50   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5349.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11360.00 TO NODE  11361.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    957.53  DOWNSTREAM(FEET) =    847.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2937.03   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.81
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.527
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      176.74      0.30     0.977     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5305.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.56
  AVERAGE FLOW DEPTH(FEET) =  10.79   TRAVEL TIME(MIN.) =   3.15
  Tc(MIN.) =   34.79
  SUBAREA AREA(ACRES) =   176.74       SUBAREA RUNOFF(CFS) =  196.31
  EFFECTIVE AREA(ACRES) =   4257.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5526.0         PEAK FLOW RATE(CFS) =    5207.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
  DEPTH(FEET) = 10.71   FLOW VELOCITY(FEET/SEC.) =  15.48
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11361.00 =   35891.29 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5042.85   27.72    1.732  0.30( 0.30) 1.00    3382.5   11330.00
      2     5122.19   29.81    1.630  0.30( 0.30) 1.00    3663.7   11350.00
      3     5193.53   33.27    1.557  0.30( 0.30) 1.00    4085.8   11300.00
      4     5207.25   34.79    1.527  0.30( 0.30) 1.00    4257.2   11250.00
      5     5205.88   34.92    1.525  0.30( 0.30) 1.00    4269.5   11130.00
      6     5154.93   35.55    1.512  0.30( 0.30) 1.00    4318.9   11220.00
      7     4785.31   52.05    1.245  0.30( 0.30) 1.00    5479.1   11111.00
      8     4766.24   52.88    1.235  0.30( 0.30) 1.00    5520.5   11201.00
      9     4751.29   53.16    1.232  0.30( 0.30) 1.00    5526.0   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5207.25  Tc(MIN.) =   34.79
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    4257.24

****************************************************************************
  FLOW PROCESS FROM NODE  11361.00 TO NODE  11362.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    847.62  DOWNSTREAM(FEET) =    738.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3869.90   CHANNEL SLOPE =  0.0283
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.438
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      429.50      0.30     0.995     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5427.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.09
  AVERAGE FLOW DEPTH(FEET) =  11.60   TRAVEL TIME(MIN.) =   4.58
  Tc(MIN.) =   39.36
  SUBAREA AREA(ACRES) =   429.50       SUBAREA RUNOFF(CFS) =  440.64
  EFFECTIVE AREA(ACRES) =   4686.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5955.5         PEAK FLOW RATE(CFS) =    5207.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.39   FLOW VELOCITY(FEET/SEC.) =  13.94
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11362.00 =   39761.19 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
      1     5042.85   32.33    1.575  0.30( 0.30) 1.00    3812.0   11330.00
      2     5122.19   34.40    1.535  0.30( 0.30) 1.00    4093.2   11350.00
      3     5193.53   37.85    1.468  0.30( 0.30) 1.00    4515.3   11300.00
      4     5207.25   39.36    1.438  0.30( 0.30) 1.00    4686.7   11250.00
      5     5205.88   39.50    1.436  0.30( 0.30) 1.00    4699.0   11130.00
      6     5154.93   40.14    1.424  0.30( 0.30) 1.00    4748.4   11220.00
      7     4785.31   56.74    1.190  0.30( 0.30) 1.00    5908.6   11111.00
      8     4766.24   57.56    1.181  0.30( 0.30) 1.00    5950.0   11201.00
      9     4751.29   57.85    1.177  0.30( 0.30) 1.00    5955.5   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5207.25  Tc(MIN.) =   39.36
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    4686.74

****************************************************************************
  FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    738.28  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2987.23   CHANNEL SLOPE =  0.0199
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.38
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.372
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.97      0.30     0.991     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.991
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5268.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.26
  AVERAGE FLOW DEPTH(FEET) =  12.37   TRAVEL TIME(MIN.) =   4.06
  Tc(MIN.) =   43.42
  SUBAREA AREA(ACRES) =   125.97       SUBAREA RUNOFF(CFS) =  121.88
  EFFECTIVE AREA(ACRES) =   4812.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6081.5         PEAK FLOW RATE(CFS) =    5207.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.31   FLOW VELOCITY(FEET/SEC.) =  12.22
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11363.00 =   42748.42 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5042.85   36.42    1.495  0.30( 0.30) 1.00    3937.9   11330.00
      2     5122.19   38.48    1.456  0.30( 0.30) 1.00    4219.2   11350.00
      3     5193.53   41.91    1.396  0.30( 0.30) 1.00    4641.2   11300.00
      4     5207.25   43.42    1.372  0.30( 0.30) 1.00    4812.7   11250.00
      5     5205.88   43.56    1.370  0.30( 0.30) 1.00    4824.9   11130.00
      6     5154.93   44.21    1.360  0.30( 0.30) 1.00    4874.4   11220.00
```



```
      7     4785.31   60.89    1.147  0.30( 0.30) 1.00    6034.5   11111.00
      8     4766.24   61.72    1.143  0.30( 0.30) 1.00    6076.0   11201.00
      9     4751.29   62.01    1.141  0.30( 0.30) 1.00    6081.5   11101.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5207.25  Tc(MIN.) =   43.42
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    4812.71
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     6081.5  TC(MIN.) =     43.42
  EFFECTIVE AREA(ACRES) =   4812.71  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.998
  PEAK FLOW RATE(CFS)   =    5207.25

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5042.85   36.42    1.495  0.30( 0.30) 1.00    3937.9   11330.00
      2     5122.19   38.48    1.456  0.30( 0.30) 1.00    4219.2   11350.00
      3     5193.53   41.91    1.396  0.30( 0.30) 1.00    4641.2   11300.00
      4     5207.25   43.42    1.372  0.30( 0.30) 1.00    4812.7   11250.00
      5     5205.88   43.56    1.370  0.30( 0.30) 1.00    4824.9   11130.00
      6     5154.93   44.21    1.360  0.30( 0.30) 1.00    4874.4   11220.00
      7     4785.31   60.89    1.147  0.30( 0.30) 1.00    6034.5   11111.00
      8     4766.24   61.72    1.143  0.30( 0.30) 1.00    6076.0   11201.00
      9     4751.29   62.01    1.141  0.30( 0.30) 1.00    6081.5   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S14.DAT
  TIME/DATE OF STUDY: 10:16 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.458
   2)   10.00;  3.512
   3)   15.00;  2.627
   4)   20.00;  2.140
   5)   25.00;  1.855
   6)   30.00;  1.612
   7)   40.00;  1.417
   8)   50.00;  1.261
   9)   60.00;  1.144
  10)   90.00;  0.979
  11)  120.00;  0.874
  12)  180.00;  0.743
  13)  360.00;  0.566
  14) 1440.00;  0.254
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11401.00 TO NODE  11401.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   313.41
  ELEVATION DATA: UPSTREAM(FEET) =   3384.11  DOWNSTREAM(FEET) =   3232.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.137
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.237
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.25      0.30     1.000     0    8.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.97
  TOTAL AREA(ACRES) =      2.25   PEAK FLOW RATE(CFS) =      7.97

**************************************************************************
  FLOW PROCESS FROM NODE  11401.50 TO NODE  11402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3232.76  DOWNSTREAM(FEET) =   3001.05
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.75   CHANNEL SLOPE =  0.3733
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.662
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.00
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   1.48
  Tc(MIN.) =    9.61
  SUBAREA AREA(ACRES) =    11.39       SUBAREA RUNOFF(CFS) =   34.46
  EFFECTIVE AREA(ACRES) =     13.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.6          PEAK FLOW RATE(CFS) =      41.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   8.35
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11402.00 =     934.16 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11402.00 TO NODE  11403.00 IS CODE =  56
```

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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3001.05  DOWNSTREAM(FEET) =   2787.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.99   CHANNEL SLOPE =  0.2213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.256
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.76
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   1.83
  Tc(MIN.) =   11.45
  SUBAREA AREA(ACRES) =    26.43       SUBAREA RUNOFF(CFS) =   70.32
  EFFECTIVE AREA(ACRES) =     40.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =     106.61
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.92   FLOW VELOCITY(FEET/SEC.) =   9.81
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11403.00 =    1897.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11403.00 TO NODE  11404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2787.96  DOWNSTREAM(FEET) =   2518.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1956.80   CHANNEL SLOPE =  0.1376
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.49
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.672
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       67.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     179.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.88
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   14.75
  SUBAREA AREA(ACRES) =    67.85       SUBAREA RUNOFF(CFS) =  144.83
  EFFECTIVE AREA(ACRES) =    107.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.9         PEAK FLOW RATE(CFS) =     230.36
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.63   FLOW VELOCITY(FEET/SEC.) =  10.66
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11404.00 =    3853.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11404.00 TO NODE  11405.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2518.71  DOWNSTREAM(FEET) =   2304.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.99   CHANNEL SLOPE =  0.1101
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.06
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.357
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     305.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.73
  AVERAGE FLOW DEPTH(FEET) =   2.02   TRAVEL TIME(MIN.) =   3.02
  Tc(MIN.) =   17.77
  SUBAREA AREA(ACRES) =    80.61       SUBAREA RUNOFF(CFS) =  149.25
  EFFECTIVE AREA(ACRES) =    188.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      188.5         PEAK FLOW RATE(CFS) =     349.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.18   FLOW VELOCITY(FEET/SEC.) =  11.17
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11405.00 =    5798.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11405.00 TO NODE  11406.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2304.57  DOWNSTREAM(FEET) =   1888.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3280.59   CHANNEL SLOPE =  0.1270
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.41
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.018
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      111.04      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     435.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.52
  AVERAGE FLOW DEPTH(FEET) =   2.36   TRAVEL TIME(MIN.) =   4.37
  Tc(MIN.) =   22.14
  SUBAREA AREA(ACRES) =   111.04       SUBAREA RUNOFF(CFS) =  171.72
  EFFECTIVE AREA(ACRES) =    299.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      299.6          PEAK FLOW RATE(CFS) =     463.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.44   FLOW VELOCITY(FEET/SEC.) =  12.77
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11406.00 =    9079.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11406.00 TO NODE  11407.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1888.00  DOWNSTREAM(FEET) =   1539.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2842.33   CHANNEL SLOPE =  0.1226
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.821
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     559.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.29
  AVERAGE FLOW DEPTH(FEET) =   2.73   TRAVEL TIME(MIN.) =   3.56
  Tc(MIN.) =   25.70
  SUBAREA AREA(ACRES) =   141.19       SUBAREA RUNOFF(CFS) =  193.28
  EFFECTIVE AREA(ACRES) =    440.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      440.8          PEAK FLOW RATE(CFS) =     603.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.84   FLOW VELOCITY(FEET/SEC.) =  13.58
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11407.00 =   11921.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11407.00 TO NODE  11408.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   1539.46  DOWNSTREAM(FEET) =   1268.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2859.01   CHANNEL SLOPE =  0.0948
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.641
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      158.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     699.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.89
  AVERAGE FLOW DEPTH(FEET) =   3.28   TRAVEL TIME(MIN.) =   3.70
  Tc(MIN.) =   29.40
  SUBAREA AREA(ACRES) =   158.63       SUBAREA RUNOFF(CFS) =  191.51
  EFFECTIVE AREA(ACRES) =    599.39     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      599.4          PEAK FLOW RATE(CFS) =     723.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.34   FLOW VELOCITY(FEET/SEC.) =  13.01
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11408.00 =   14780.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11408.00 TO NODE  11409.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1268.36  DOWNSTREAM(FEET) =   1109.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2883.36   CHANNEL SLOPE =  0.0550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.16
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.540
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      208.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     840.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.13
  AVERAGE FLOW DEPTH(FEET) =   4.13   TRAVEL TIME(MIN.) =   4.32
  Tc(MIN.) =   33.71
  SUBAREA AREA(ACRES) =   208.66       SUBAREA RUNOFF(CFS) =  232.80
  EFFECTIVE AREA(ACRES) =    808.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      808.1          PEAK FLOW RATE(CFS) =     901.53
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.28
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.28   FLOW VELOCITY(FEET/SEC.) =  11.34
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.00 =   17664.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.00 TO NODE  11409.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1109.80  DOWNSTREAM(FEET) =    953.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2734.25   CHANNEL SLOPE =  0.0572
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.37
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.463
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       97.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     952.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.68
  AVERAGE FLOW DEPTH(FEET) =   4.36   TRAVEL TIME(MIN.) =   3.90
  Tc(MIN.) =   37.62
  SUBAREA AREA(ACRES) =    97.66       SUBAREA RUNOFF(CFS) =  102.27
  EFFECTIVE AREA(ACRES) =    905.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      905.7         PEAK FLOW RATE(CFS) =     948.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.35   FLOW VELOCITY(FEET/SEC.) =  11.65
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.50 =   20398.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.50 TO NODE  11410.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    953.45  DOWNSTREAM(FEET) =    914.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.66   CHANNEL SLOPE =  0.0357
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.06
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.428
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      130.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1014.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.98
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  AVERAGE FLOW DEPTH(FEET) =   5.06   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   39.46
  SUBAREA AREA(ACRES) =   130.64       SUBAREA RUNOFF(CFS) =  132.59
  EFFECTIVE AREA(ACRES) =   1036.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1036.4         PEAK FLOW RATE(CFS) =    1051.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.15   FLOW VELOCITY(FEET/SEC.) =  10.08
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11410.00 =   21499.14 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11410.00 TO NODE  11411.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    914.20  DOWNSTREAM(FEET) =    740.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3015.96   CHANNEL SLOPE =  0.0576
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.89
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.362
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      299.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1195.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.43
  AVERAGE FLOW DEPTH(FEET) =   4.87   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   43.50
  SUBAREA AREA(ACRES) =   299.66       SUBAREA RUNOFF(CFS) =  286.55
  EFFECTIVE AREA(ACRES) =   1336.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1336.0         PEAK FLOW RATE(CFS) =    1277.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.03   FLOW VELOCITY(FEET/SEC.) =  12.66
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11411.00 =   24515.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.43  DOWNSTREAM(FEET) =    651.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1605.97   CHANNEL SLOPE =  0.0553
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.15
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.329
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       70.41      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1310.15
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.54
 AVERAGE FLOW DEPTH(FEET) =   5.15   TRAVEL TIME(MIN.) =   2.13
 Tc(MIN.) =   45.63
 SUBAREA AREA(ACRES) =    70.41       SUBAREA RUNOFF(CFS) =   65.22
 EFFECTIVE AREA(ACRES) =   1406.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1406.4         PEAK FLOW RATE(CFS) =    1302.73
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.13

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.13   FLOW VELOCITY(FEET/SEC.) =  12.53
 LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11431.00 =   26121.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S10.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1    11359.78   24.90  0.30( 0.30) 1.00    4247.8   11000.00
     2    12671.60   37.63  0.30( 0.30) 1.00    7295.2   10850.00
     3    12747.57   38.40  0.30( 0.30) 1.00    7483.8   10800.00
     4    12876.91   40.68  0.30( 0.30) 1.00    8132.5   10900.00
     5    13054.22   43.61  0.30( 0.30) 1.00    8885.4   10830.00
     6    13060.93   43.86  0.30( 0.30) 1.00    8944.2   10910.00
     7    13055.49   44.49  0.30( 0.30) 1.00    9067.3   10630.00
     8    12789.15   55.97  0.30( 0.30) 1.00   11479.7   10600.00
     9    12646.32   63.08  0.30( 0.30) 1.00   12976.5   10500.00
    10    12569.47   67.41  0.30( 0.30) 1.00   13835.6   10710.00
    11    12457.38   69.59  0.30( 0.30) 1.00   14186.1   10410.00
    12    12403.56   74.18  0.30( 0.30) 1.00   14861.2   10700.00
    13    12338.77   80.69  0.30( 0.30) 1.00   15753.3   10400.00
    14    12250.21   83.20  0.30( 0.30) 1.00   16041.7   10200.00
    15    11978.22   89.24  0.30( 0.30) 1.00   16636.0   10300.00
    16    11972.35   89.34  0.30( 0.30) 1.00   16642.2   10320.00
    17    11605.86   93.93  0.30( 0.30) 1.00   16825.9   10210.00
    18    10144.97  121.22  0.30( 0.30) 1.00   17533.1   10100.00
   TOTAL AREA(ACRES) =    17533.1
```



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****************************************************************************
 FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S13.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     5042.85   36.42  0.30( 0.30) 1.00    3937.9   11330.00
     2     5122.19   38.48  0.30( 0.30) 1.00    4219.2   11350.00
     3     5193.53   41.91  0.30( 0.30) 1.00    4641.2   11300.00
     4     5207.25   43.42  0.30( 0.30) 1.00    4812.7   11250.00
     5     5205.88   43.56  0.30( 0.30) 1.00    4824.9   11130.00
     6     5154.93   44.21  0.30( 0.30) 1.00    4874.4   11220.00
     7     4785.31   60.89  0.30( 0.30) 1.00    6034.5   11111.00
     8     4766.24   61.72  0.30( 0.30) 1.00    6076.0   11201.00
     9     4751.29   62.01  0.30( 0.30) 1.00    6081.5   11101.00
   TOTAL AREA(ACRES) =     6081.5

****************************************************************************
 FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     5042.85   36.42  0.30( 0.30) 1.00    3937.9   11330.00
     2     5122.19   38.48  0.30( 0.30) 1.00    4219.2   11350.00
     3     5193.53   41.91  0.30( 0.30) 1.00    4641.2   11300.00
     4     5207.25   43.42  0.30( 0.30) 1.00    4812.7   11250.00
     5     5205.88   43.56  0.30( 0.30) 1.00    4824.9   11130.00
     6     5154.93   44.21  0.30( 0.30) 1.00    4874.4   11220.00
     7     4785.31   60.89  0.30( 0.30) 1.00    6034.5   11111.00
     8     4766.24   61.72  0.30( 0.30) 1.00    6076.0   11201.00
     9     4751.29   62.01  0.30( 0.30) 1.00    6081.5   11101.00
   TOTAL AREA(ACRES) =      6081.5

****************************************************************************
 FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5042.85   36.42    1.487  0.30( 0.30) 1.00    3937.9   11330.00
     2     5122.19   38.48    1.447  0.30( 0.30) 1.00    4219.2   11350.00
     3     5193.53   41.91    1.387  0.30( 0.30) 1.00    4641.2   11300.00
     4     5207.25   43.42    1.364  0.30( 0.30) 1.00    4812.7   11250.00
     5     5205.88   43.56    1.361  0.30( 0.30) 1.00    4824.9   11130.00
     6     5154.93   44.21    1.351  0.30( 0.30) 1.00    4874.4   11220.00
     7     4785.31   60.89    1.139  0.30( 0.30) 1.00    6034.5   11111.00
     8     4766.24   61.72    1.135  0.30( 0.30) 1.00    6076.0   11201.00
```

9	4751.29	62.01	1.133	0.30(0.30)	1.00	6081.5	11101.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11359.78	24.90	1.861	0.30(0.30)	1.00	4247.8	11000.00
2	12671.60	37.63	1.463	0.30(0.30)	1.00	7295.2	10850.00
3	12747.57	38.40	1.448	0.30(0.30)	1.00	7483.8	10800.00
4	12876.91	40.68	1.406	0.30(0.30)	1.00	8132.5	10900.00
5	13054.22	43.61	1.361	0.30(0.30)	1.00	8885.4	10830.00
6	13060.93	43.86	1.357	0.30(0.30)	1.00	8944.2	10910.00
7	13055.49	44.49	1.347	0.30(0.30)	1.00	9067.3	10630.00
8	12789.15	55.97	1.191	0.30(0.30)	1.00	11479.7	10600.00
9	12646.32	63.08	1.127	0.30(0.30)	1.00	12976.5	10500.00
10	12569.47	67.41	1.103	0.30(0.30)	1.00	13835.6	10710.00
11	12457.38	69.59	1.091	0.30(0.30)	1.00	14186.1	10410.00
12	12403.56	74.18	1.066	0.30(0.30)	1.00	14861.2	10700.00
13	12338.77	80.69	1.030	0.30(0.30)	1.00	15753.3	10400.00
14	12250.21	83.20	1.016	0.30(0.30)	1.00	16041.7	10200.00
15	11978.22	89.24	0.983	0.30(0.30)	1.00	16636.0	10300.00
16	11972.35	89.34	0.983	0.30(0.30)	1.00	16642.2	10320.00
17	11605.86	93.93	0.965	0.30(0.30)	1.00	16825.9	10210.00
18	10144.97	121.22	0.871	0.30(0.30)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15892.79	24.90	1.861	0.30(0.30)	1.00	6939.4	11000.00
2	17590.15	36.42	1.487	0.30(0.30)	1.00	10944.4	11330.00
3	17761.11	37.63	1.463	0.30(0.30)	1.00	11398.6	10850.00
4	17866.85	38.40	1.448	0.30(0.30)	1.00	11692.7	10800.00
5	17874.02	38.48	1.447	0.30(0.30)	1.00	11724.4	11350.00
6	18044.78	40.68	1.406	0.30(0.30)	1.00	12622.0	10900.00
7	18145.17	41.91	1.387	0.30(0.30)	1.00	13091.1	11300.00
8	18250.40	43.42	1.364	0.30(0.30)	1.00	13651.1	11250.00
9	18257.37	43.56	1.361	0.30(0.30)	1.00	13698.7	11130.00
10	18256.56	43.61	1.361	0.30(0.30)	1.00	13713.8	10830.00
11	18243.22	43.86	1.357	0.30(0.30)	1.00	13792.1	10910.00
12	18212.81	44.21	1.351	0.30(0.30)	1.00	13887.6	11220.00
13	18204.36	44.49	1.347	0.30(0.30)	1.00	13960.7	10630.00
14	17683.55	55.97	1.191	0.30(0.30)	1.00	17171.8	10600.00
15	17475.68	60.89	1.139	0.30(0.30)	1.00	18549.4	11111.00
16	17439.92	61.72	1.135	0.30(0.30)	1.00	18765.9	11201.00
17	17419.09	62.01	1.133	0.30(0.30)	1.00	18832.9	11101.00
18	17364.06	63.08	1.127	0.30(0.30)	1.00	19057.9	10500.00
19	17151.52	67.41	1.103	0.30(0.30)	1.00	19917.0	10710.00
20	16970.89	69.59	1.091	0.30(0.30)	1.00	20267.5	10410.00
21	16773.41	74.18	1.066	0.30(0.30)	1.00	20942.7	10700.00
22	16504.42	80.69	1.030	0.30(0.30)	1.00	21834.7	10400.00
23	16337.19	83.20	1.016	0.30(0.30)	1.00	22123.2	10200.00
24	15875.58	89.24	0.983	0.30(0.30)	1.00	22717.5	10300.00
25	15866.71	89.34	0.983	0.30(0.30)	1.00	22723.7	10320.00
26	15401.15	93.93	0.965	0.30(0.30)	1.00	22907.4	10210.00
27	13404.90	121.22	0.871	0.30(0.30)	1.00	23614.5	10100.00

TOTAL AREA(ACRES) = 23614.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 18257.37 Tc(MIN.) = 43.562
EFFECTIVE AREA(ACRES) = 13698.70 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 23614.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

****
FLOW PROCESS FROM NODE 11363.00 TO NODE 11431.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 678.93 DOWNSTREAM(FEET) = 651.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 2069.94 CHANNEL SLOPE = 0.0132
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050
*ESTIMATED CHANNEL HEIGHT(FEET) = 15.71
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.326
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.16	0.30	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18333.69
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.14
AVERAGE FLOW DEPTH(FEET) = 15.70 TRAVEL TIME(MIN.) = 2.28
Tc(MIN.) = 45.84
SUBAREA AREA(ACRES) = 165.16 SUBAREA RUNOFF(CFS) = 152.64
EFFECTIVE AREA(ACRES) = 13863.86 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 23779.7 PEAK FLOW RATE(CFS) = 18257.37
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050
*ESTIMATED CHANNEL HEIGHT(FEET) = 15.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 15.67 FLOW VELOCITY(FEET/SEC.) = 15.12
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15892.79	27.26	1.745	0.30(0.30)	1.00	7104.6	11000.00
2	17590.15	38.72	1.442	0.30(0.30)	1.00	11109.6	11330.00
3	17761.11	39.93	1.418	0.30(0.30)	1.00	11563.7	10850.00
4	17866.85	40.69	1.406	0.30(0.30)	1.00	11857.9	10800.00
5	17874.02	40.77	1.405	0.30(0.30)	1.00	11889.6	11350.00
6	18044.78	42.96	1.371	0.30(0.30)	1.00	12787.2	10900.00
7	18145.17	44.19	1.352	0.30(0.30)	1.00	13256.3	11300.00
8	18250.40	45.70	1.328	0.30(0.30)	1.00	13816.3	11250.00
9	18257.37	45.84	1.326	0.30(0.30)	1.00	13863.9	11130.00
10	18256.56	45.88	1.325	0.30(0.30)	1.00	13878.9	10830.00
11	18243.22	46.14	1.321	0.30(0.30)	1.00	13957.2	10910.00
12	18212.81	46.49	1.316	0.30(0.30)	1.00	14052.8	11220.00
13	18204.36	46.77	1.311	0.30(0.30)	1.00	14125.8	10630.00

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    14    17683.55   58.26    1.164  0.30( 0.30) 1.00   17337.0   10600.00
    15    17475.68   63.19    1.126  0.30( 0.30) 1.00   18714.6   11111.00
    16    17439.92   64.02    1.122  0.30( 0.30) 1.00   18931.0   11201.00
    17    17419.09   64.32    1.120  0.30( 0.30) 1.00   18998.1   11101.00
    18    17364.06   65.39    1.114  0.30( 0.30) 1.00   19223.1   10500.00
    19    17151.52   69.72    1.091  0.30( 0.30) 1.00   20082.2   10710.00
    20    16970.89   71.92    1.078  0.30( 0.30) 1.00   20432.7   10410.00
    21    16773.41   76.51    1.053  0.30( 0.30) 1.00   21107.8   10700.00
    22    16504.42   83.03    1.017  0.30( 0.30) 1.00   21999.9   10400.00
    23    16337.19   85.54    1.004  0.30( 0.30) 1.00   22288.4   10200.00
    24    15875.58   91.61    0.973  0.30( 0.30) 1.00   22882.7   10300.00
    25    15866.71   91.70    0.973  0.30( 0.30) 1.00   22888.9   10320.00
    26    15401.15   96.31    0.957  0.30( 0.30) 1.00   23072.5   10210.00
    27    13404.90  123.69    0.866  0.30( 0.30) 1.00   23779.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   18257.37  Tc(MIN.) =   45.84
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =   13863.86

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    15892.79   27.26    1.745  0.30( 0.30) 1.00    7104.6   11000.00
      2    17590.15   38.72    1.442  0.30( 0.30) 1.00   11109.6   11330.00
      3    17761.11   39.93    1.418  0.30( 0.30) 1.00   11563.7   10850.00
      4    17866.85   40.69    1.406  0.30( 0.30) 1.00   11857.9   10800.00
      5    17874.02   40.77    1.405  0.30( 0.30) 1.00   11889.6   11350.00
      6    18044.78   42.96    1.371  0.30( 0.30) 1.00   12787.2   10900.00
      7    18145.17   44.19    1.352  0.30( 0.30) 1.00   13256.3   11300.00
      8    18250.40   45.70    1.328  0.30( 0.30) 1.00   13816.3   11250.00
      9    18257.37   45.84    1.326  0.30( 0.30) 1.00   13863.9   11130.00
     10    18256.56   45.88    1.325  0.30( 0.30) 1.00   13878.9   10830.00
     11    18243.22   46.14    1.321  0.30( 0.30) 1.00   13957.2   10910.00
     12    18212.81   46.49    1.316  0.30( 0.30) 1.00   14052.8   11220.00
     13    18204.36   46.77    1.311  0.30( 0.30) 1.00   14125.8   10630.00
     14    17683.55   58.26    1.164  0.30( 0.30) 1.00   17337.0   10600.00
     15    17475.68   63.19    1.126  0.30( 0.30) 1.00   18714.6   11111.00
     16    17439.92   64.02    1.122  0.30( 0.30) 1.00   18931.0   11201.00
     17    17419.09   64.32    1.120  0.30( 0.30) 1.00   18998.1   11101.00
     18    17364.06   65.39    1.114  0.30( 0.30) 1.00   19223.1   10500.00
     19    17151.52   69.72    1.091  0.30( 0.30) 1.00   20082.2   10710.00
     20    16970.89   71.92    1.078  0.30( 0.30) 1.00   20432.7   10410.00
     21    16773.41   76.51    1.053  0.30( 0.30) 1.00   21107.8   10700.00
     22    16504.42   83.03    1.017  0.30( 0.30) 1.00   21999.9   10400.00
     23    16337.19   85.54    1.004  0.30( 0.30) 1.00   22288.4   10200.00
     24    15875.58   91.61    0.973  0.30( 0.30) 1.00   22882.7   10300.00
     25    15866.71   91.70    0.973  0.30( 0.30) 1.00   22888.9   10320.00
     26    15401.15   96.31    0.957  0.30( 0.30) 1.00   23072.5   10210.00
     27    13404.90  123.69    0.866  0.30( 0.30) 1.00   23779.7   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11431.00 =   71223.96 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
```



```
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1302.73   45.63    1.329  0.30( 0.30) 1.00    1406.4   11401.00
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11431.00 =   26121.07 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16985.58   27.26    1.745  0.30( 0.30) 1.00    7944.6   11000.00
      2    18816.77   38.72    1.442  0.30( 0.30) 1.00   12303.0   11330.00
      3    18999.83   39.93    1.418  0.30( 0.30) 1.00   12794.2   10850.00
      4    19115.54   40.69    1.406  0.30( 0.30) 1.00   13112.0   10800.00
      5    19123.67   40.77    1.405  0.30( 0.30) 1.00   13146.0   11350.00
      6    19320.91   42.96    1.371  0.30( 0.30) 1.00   14111.3   10900.00
      7    19434.33   44.19    1.352  0.30( 0.30) 1.00   14618.3   11300.00
      8    19548.29   45.63    1.329  0.30( 0.30) 1.00   15196.9   11401.00
      9    19551.76   45.70    1.328  0.30( 0.30) 1.00   15222.7   11250.00
     10    19556.00   45.84    1.326  0.30( 0.30) 1.00   15270.3   11130.00
     11    19554.33   45.88    1.325  0.30( 0.30) 1.00   15285.3   10830.00
     12    19535.90   46.14    1.321  0.30( 0.30) 1.00   15363.6   10910.00
     13    19498.57   46.49    1.316  0.30( 0.30) 1.00   15459.2   11220.00
     14    19484.71   46.77    1.311  0.30( 0.30) 1.00   15532.3   10630.00
     15    18777.69   58.26    1.164  0.30( 0.30) 1.00   18743.4   10600.00
     16    18521.87   63.19    1.126  0.30( 0.30) 1.00   20121.0   11111.00
     17    18480.30   64.02    1.122  0.30( 0.30) 1.00   20337.5   11201.00
     18    18457.43   64.32    1.120  0.30( 0.30) 1.00   20404.5   11101.00
     19    18394.95   65.39    1.114  0.30( 0.30) 1.00   20629.5   10500.00
     20    18152.22   69.72    1.091  0.30( 0.30) 1.00   21488.6   10710.00
     21    17956.33   71.92    1.078  0.30( 0.30) 1.00   21839.1   10410.00
     22    17726.91   76.51    1.053  0.30( 0.30) 1.00   22514.2   10700.00
     23    17412.52   83.03    1.017  0.30( 0.30) 1.00   23406.3   10400.00
     24    17227.77   85.54    1.004  0.30( 0.30) 1.00   23694.8   10200.00
     25    16728.00   91.61    0.973  0.30( 0.30) 1.00   24289.1   10300.00
     26    16718.71   91.70    0.973  0.30( 0.30) 1.00   24295.3   10320.00
     27    16232.74   96.31    0.957  0.30( 0.30) 1.00   24479.0   10210.00
     28    14121.36  123.69    0.866  0.30( 0.30) 1.00   25186.1   10100.00
    TOTAL AREA(ACRES) =     25186.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    19556.00  Tc(MIN.) =   45.840
  EFFECTIVE AREA(ACRES) =  15270.28  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    25186.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11431.00 =   71223.96 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    25186.1  TC(MIN.) =     45.84
  EFFECTIVE AREA(ACRES) =  15270.28  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =   19556.00

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16985.58   27.26    1.745  0.30( 0.30) 1.00    7944.6   11000.00
      2    18816.77   38.72    1.442  0.30( 0.30) 1.00   12303.0   11330.00
      3    18999.83   39.93    1.418  0.30( 0.30) 1.00   12794.2   10850.00
      4    19115.54   40.69    1.406  0.30( 0.30) 1.00   13112.0   10800.00
```

5	19123.67	40.77	1.405	0.30(0.30)	1.00	13146.0	11350.00
6	19320.91	42.96	1.371	0.30(0.30)	1.00	14111.3	10900.00
7	19434.33	44.19	1.352	0.30(0.30)	1.00	14618.3	11300.00
8	19548.29	45.63	1.329	0.30(0.30)	1.00	15196.9	11401.00
9	19551.76	45.70	1.328	0.30(0.30)	1.00	15222.7	11250.00
10	19556.00	45.84	1.326	0.30(0.30)	1.00	15270.3	11130.00
11	19554.33	45.88	1.325	0.30(0.30)	1.00	15285.3	10830.00
12	19535.90	46.14	1.321	0.30(0.30)	1.00	15363.6	10910.00
13	19498.57	46.49	1.316	0.30(0.30)	1.00	15459.2	11220.00
14	19484.71	46.77	1.311	0.30(0.30)	1.00	15532.3	10630.00
15	18777.69	58.26	1.164	0.30(0.30)	1.00	18743.4	10600.00
16	18521.87	63.19	1.126	0.30(0.30)	1.00	20121.0	11111.00
17	18480.30	64.02	1.122	0.30(0.30)	1.00	20337.5	11201.00
18	18457.43	64.32	1.120	0.30(0.30)	1.00	20404.5	11101.00
19	18394.95	65.39	1.114	0.30(0.30)	1.00	20629.5	10500.00
20	18152.22	69.72	1.091	0.30(0.30)	1.00	21488.6	10710.00
21	17956.33	71.92	1.078	0.30(0.30)	1.00	21839.1	10410.00
22	17726.91	76.51	1.053	0.30(0.30)	1.00	22514.2	10700.00
23	17412.52	83.03	1.017	0.30(0.30)	1.00	23406.3	10400.00
24	17227.77	85.54	1.004	0.30(0.30)	1.00	23694.8	10200.00
25	16728.00	91.61	0.973	0.30(0.30)	1.00	24289.1	10300.00
26	16718.71	91.70	0.973	0.30(0.30)	1.00	24295.3	10320.00
27	16232.74	96.31	0.957	0.30(0.30)	1.00	24479.0	10210.00
28	14121.36	123.69	0.866	0.30(0.30)	1.00	25186.1	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S15.DAT
  TIME/DATE OF STUDY: 10:16 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.268
   2)   10.00;  3.404
   3)   15.00;  2.563
   4)   20.00;  2.098
   5)   25.00;  1.822
   6)   30.00;  1.588
   7)   40.00;  1.392
   8)   50.00;  1.237
   9)   60.00;  1.117
  10)   90.00;  0.951
  11)  120.00;  0.844
  12)  180.00;  0.714
  13)  360.00;  0.539
  14) 1440.00;  0.240
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11500.00 TO NODE  11501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   352.85
  ELEVATION DATA: UPSTREAM(FEET) =   1891.25  DOWNSTREAM(FEET) =   1665.22

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.064
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.126
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.58      0.30     1.000      0    8.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.44
  TOTAL AREA(ACRES) =      1.58   PEAK FLOW RATE(CFS) =      5.44

**************************************************************************
  FLOW PROCESS FROM NODE  11501.00 TO NODE  11502.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1665.22  DOWNSTREAM(FEET) =   1423.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.67   CHANNEL SLOPE =  0.3849
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.457
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.84      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.83
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   1.79
  Tc(MIN.) =    9.86
  SUBAREA AREA(ACRES) =     6.84       SUBAREA RUNOFF(CFS) =   19.43
  EFFECTIVE AREA(ACRES) =      8.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.4          PEAK FLOW RATE(CFS) =      23.92
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   6.91
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11502.00 =     980.52 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11502.00 TO NODE  11503.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1423.64  DOWNSTREAM(FEET) =   1258.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   937.16   CHANNEL SLOPE =  0.1758
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.73
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.074
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.43
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.10
  Tc(MIN.) =   11.96
  SUBAREA AREA(ACRES) =    28.16       SUBAREA RUNOFF(CFS) =   70.31
  EFFECTIVE AREA(ACRES) =     36.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       36.6         PEAK FLOW RATE(CFS) =      91.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   8.63
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11503.00 =    1917.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11503.00 TO NODE  11504.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1258.86  DOWNSTREAM(FEET) =   1009.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.29   CHANNEL SLOPE =  0.1298
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.528
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     161.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.37
  AVERAGE FLOW DEPTH(FEET) =   1.36   TRAVEL TIME(MIN.) =   3.42
  Tc(MIN.) =   15.38
  SUBAREA AREA(ACRES) =    69.67       SUBAREA RUNOFF(CFS) =  139.68
  EFFECTIVE AREA(ACRES) =    106.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.2         PEAK FLOW RATE(CFS) =     213.01
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.58   FLOW VELOCITY(FEET/SEC.) =  10.21
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11504.00 =    3841.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1009.04  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2817.91   CHANNEL SLOPE =  0.1475
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.145
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       65.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     267.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.42
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   4.11
  Tc(MIN.) =   19.49
  SUBAREA AREA(ACRES) =    65.12       SUBAREA RUNOFF(CFS) =  108.14
  EFFECTIVE AREA(ACRES) =    171.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.4         PEAK FLOW RATE(CFS) =     284.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.80   FLOW VELOCITY(FEET/SEC.) =  11.64
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  10
------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 15.1
------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S14.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    16985.58   27.26  0.30( 0.30) 1.00    7944.6   11000.00
```

```
      2    18816.77   38.72  0.30( 0.30) 1.00   12303.0   11330.00
      3    18999.83   39.93  0.30( 0.30) 1.00   12794.2   10850.00
      4    19123.67   40.77  0.30( 0.30) 1.00   13146.0   11350.00
      5    19320.91   42.96  0.30( 0.30) 1.00   14111.3   10900.00
      6    19434.33   44.19  0.30( 0.30) 1.00   14618.3   11300.00
      7    19556.00   45.84  0.30( 0.30) 1.00   15270.3   11130.00
      8    19498.57   46.49  0.30( 0.30) 1.00   15459.2   11220.00
      9    18777.69   58.26  0.30( 0.30) 1.00   18743.4   10600.00
     10    18521.87   63.19  0.30( 0.30) 1.00   20121.0   11111.00
     11    18480.30   64.02  0.30( 0.30) 1.00   20337.5   11201.00
     12    18394.95   65.39  0.30( 0.30) 1.00   20629.5   10500.00
     13    18152.22   69.72  0.30( 0.30) 1.00   21488.6   10710.00
     14    17956.33   71.92  0.30( 0.30) 1.00   21839.1   10410.00
     15    17726.91   76.51  0.30( 0.30) 1.00   22514.2   10700.00
     16    17412.52   83.03  0.30( 0.30) 1.00   23406.3   10400.00
     17    17227.77   85.54  0.30( 0.30) 1.00   23694.8   10200.00
     18    16728.00   91.61  0.30( 0.30) 1.00   24289.1   10300.00
     19    16232.74   96.31  0.30( 0.30) 1.00   24479.0   10210.00
     20    14121.36  123.69  0.30( 0.30) 1.00   25186.1   10100.00
   TOTAL AREA(ACRES) =    25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
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  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    16985.58   27.26  0.30( 0.30) 1.00    7944.6   11000.00
      2    18816.77   38.72  0.30( 0.30) 1.00   12303.0   11330.00
      3    18999.83   39.93  0.30( 0.30) 1.00   12794.2   10850.00
      4    19123.67   40.77  0.30( 0.30) 1.00   13146.0   11350.00
      5    19320.91   42.96  0.30( 0.30) 1.00   14111.3   10900.00
      6    19434.33   44.19  0.30( 0.30) 1.00   14618.3   11300.00
      7    19556.00   45.84  0.30( 0.30) 1.00   15270.3   11130.00
      8    19498.57   46.49  0.30( 0.30) 1.00   15459.2   11220.00
      9    18777.69   58.26  0.30( 0.30) 1.00   18743.4   10600.00
     10    18521.87   63.19  0.30( 0.30) 1.00   20121.0   11111.00
     11    18480.30   64.02  0.30( 0.30) 1.00   20337.5   11201.00
     12    18394.95   65.39  0.30( 0.30) 1.00   20629.5   10500.00
     13    18152.22   69.72  0.30( 0.30) 1.00   21488.6   10710.00
     14    17956.33   71.92  0.30( 0.30) 1.00   21839.1   10410.00
     15    17726.91   76.51  0.30( 0.30) 1.00   22514.2   10700.00
     16    17412.52   83.03  0.30( 0.30) 1.00   23406.3   10400.00
     17    17227.77   85.54  0.30( 0.30) 1.00   23694.8   10200.00
     18    16728.00   91.61  0.30( 0.30) 1.00   24289.1   10300.00
     19    16232.74   96.31  0.30( 0.30) 1.00   24479.0   10210.00
     20    14121.36  123.69  0.30( 0.30) 1.00   25186.1   10100.00
   TOTAL AREA(ACRES) =     25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =    651.70  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2004.08   CHANNEL SLOPE =  0.0291
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.46
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.276
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   19580.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.67
  AVERAGE FLOW DEPTH(FEET) =  13.46   TRAVEL TIME(MIN.) =   1.62
  Tc(MIN.) =   47.46
  SUBAREA AREA(ACRES) =    54.88       SUBAREA RUNOFF(CFS) =   48.23
  EFFECTIVE AREA(ACRES) =  15325.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    25241.0          PEAK FLOW RATE(CFS) =   19556.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.45   FLOW VELOCITY(FEET/SEC.) =  20.66
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16985.58   28.93    1.638  0.30( 0.30) 1.00    7999.5   11000.00
      2    18816.77   40.36    1.386  0.30( 0.30) 1.00   12357.9   11330.00
      3    18999.83   41.55    1.368  0.30( 0.30) 1.00   12849.1   10850.00
      4    19123.67   42.39    1.355  0.30( 0.30) 1.00   13200.9   11350.00
      5    19320.91   44.58    1.321  0.30( 0.30) 1.00   14166.1   10900.00
      6    19434.33   45.81    1.302  0.30( 0.30) 1.00   14673.2   11300.00
      7    19556.00   47.46    1.276  0.30( 0.30) 1.00   15325.2   11130.00
      8    19498.57   48.11    1.266  0.30( 0.30) 1.00   15514.1   11220.00
      9    18777.69   59.90    1.118  0.30( 0.30) 1.00   18798.3   10600.00
     10    18521.87   64.83    1.090  0.30( 0.30) 1.00   20175.9   11111.00
     11    18480.30   65.66    1.086  0.30( 0.30) 1.00   20392.3   11201.00
     12    18394.95   67.03    1.078  0.30( 0.30) 1.00   20684.4   10500.00
     13    18152.22   71.37    1.054  0.30( 0.30) 1.00   21543.5   10710.00
     14    17956.33   73.57    1.042  0.30( 0.30) 1.00   21894.0   10410.00
     15    17726.91   78.16    1.016  0.30( 0.30) 1.00   22569.1   10700.00
     16    17412.52   84.69    0.980  0.30( 0.30) 1.00   23461.2   10400.00
     17    17227.77   87.21    0.966  0.30( 0.30) 1.00   23749.7   10200.00
     18    16728.00   93.29    0.939  0.30( 0.30) 1.00   24344.0   10300.00
     19    16232.74   98.01    0.922  0.30( 0.30) 1.00   24533.8   10210.00
     20    14121.36  125.45    0.832  0.30( 0.30) 1.00   25241.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   19556.00  Tc(MIN.) =   47.46
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =   15325.16

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 FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    16985.58   28.93    1.638  0.30( 0.30) 1.00    7999.5   11000.00
     2    18816.77   40.36    1.386  0.30( 0.30) 1.00   12357.9   11330.00
     3    18999.83   41.55    1.368  0.30( 0.30) 1.00   12849.1   10850.00
     4    19123.67   42.39    1.355  0.30( 0.30) 1.00   13200.9   11350.00
     5    19320.91   44.58    1.321  0.30( 0.30) 1.00   14166.1   10900.00
     6    19434.33   45.81    1.302  0.30( 0.30) 1.00   14673.2   11300.00
     7    19556.00   47.46    1.276  0.30( 0.30) 1.00   15325.2   11130.00
     8    19498.57   48.11    1.266  0.30( 0.30) 1.00   15514.1   11220.00
     9    18777.69   59.90    1.118  0.30( 0.30) 1.00   18798.3   10600.00
    10    18521.87   64.83    1.090  0.30( 0.30) 1.00   20175.9   11111.00
    11    18480.30   65.66    1.086  0.30( 0.30) 1.00   20392.3   11201.00
    12    18394.95   67.03    1.078  0.30( 0.30) 1.00   20684.4   10500.00
    13    18152.22   71.37    1.054  0.30( 0.30) 1.00   21543.5   10710.00
    14    17956.33   73.57    1.042  0.30( 0.30) 1.00   21894.0   10410.00
    15    17726.91   78.16    1.016  0.30( 0.30) 1.00   22569.1   10700.00
    16    17412.52   84.69    0.980  0.30( 0.30) 1.00   23461.2   10400.00
    17    17227.77   87.21    0.966  0.30( 0.30) 1.00   23749.7   10200.00
    18    16728.00   93.29    0.939  0.30( 0.30) 1.00   24344.0   10300.00
    19    16232.74   98.01    0.922  0.30( 0.30) 1.00   24533.8   10210.00
    20    14121.36  125.45    0.832  0.30( 0.30) 1.00   25241.0   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      284.58   19.49    2.145  0.30( 0.30) 1.00     171.4   11500.00
 LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    16064.83   19.49    2.145  0.30( 0.30) 1.00    5561.1   11500.00
     2    17191.95   28.93    1.638  0.30( 0.30) 1.00    8170.9   11000.00
     3    18984.35   40.36    1.386  0.30( 0.30) 1.00   12529.3   11330.00
     4    19164.55   41.55    1.368  0.30( 0.30) 1.00   13020.5   10850.00
     5    19286.39   42.39    1.355  0.30( 0.30) 1.00   13372.3   11350.00
     6    19478.39   44.58    1.321  0.30( 0.30) 1.00   14337.5   10900.00
     7    19588.87   45.81    1.302  0.30( 0.30) 1.00   14844.5   11300.00
     8    19706.61   47.46    1.276  0.30( 0.30) 1.00   15496.5   11130.00
     9    19647.62   48.11    1.266  0.30( 0.30) 1.00   15685.5   11220.00
    10    18903.90   59.90    1.118  0.30( 0.30) 1.00   18969.7   10600.00
    11    18643.77   64.83    1.090  0.30( 0.30) 1.00   20347.2   11111.00
    12    18601.49   65.66    1.086  0.30( 0.30) 1.00   20563.7   11201.00
    13    18514.96   67.03    1.078  0.30( 0.30) 1.00   20855.8   10500.00
    14    18268.54   71.37    1.054  0.30( 0.30) 1.00   21714.9   10710.00
    15    18070.77   73.57    1.042  0.30( 0.30) 1.00   22065.3   10410.00
    16    17837.43   78.16    1.016  0.30( 0.30) 1.00   22740.5   10700.00
    17    17517.46   84.69    0.980  0.30( 0.30) 1.00   23632.5   10400.00
    18    17330.56   87.21    0.966  0.30( 0.30) 1.00   23921.0   10200.00
    19    16826.61   93.29    0.939  0.30( 0.30) 1.00   24515.3   10300.00
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    20    16328.75   98.01    0.922  0.30( 0.30) 1.00   24705.2   10210.00
    21    14203.45  125.45    0.832  0.30( 0.30) 1.00   25412.4   10100.00
  TOTAL AREA(ACRES) =     25412.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    19706.61  Tc(MIN.) =   47.457
 EFFECTIVE AREA(ACRES) =  15496.53  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =    25412.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

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 FLOW PROCESS FROM NODE  11520.00 TO NODE  11540.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    593.37  DOWNSTREAM(FEET) =    577.77
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1515.75   CHANNEL SLOPE =  0.0103
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.80
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.249
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      100.60      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   19749.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.49
 AVERAGE FLOW DEPTH(FEET) =   9.79   TRAVEL TIME(MIN.) =   1.74
 Tc(MIN.) =   49.20
 SUBAREA AREA(ACRES) =   100.60       SUBAREA RUNOFF(CFS) =   85.97
 EFFECTIVE AREA(ACRES) =  15597.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    25513.0         PEAK FLOW RATE(CFS) =   19706.61
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.78

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.78   FLOW VELOCITY(FEET/SEC.) =  14.49
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11540.00 =   74743.79 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    16064.83   21.35    2.024  0.30( 0.30) 1.00    5661.7   11500.00
     2    17191.95   30.75    1.573  0.30( 0.30) 1.00    8271.5   11000.00
     3    18984.35   42.12    1.359  0.30( 0.30) 1.00   12629.9   11330.00
     4    19164.55   43.31    1.341  0.30( 0.30) 1.00   13121.1   10850.00
     5    19286.39   44.15    1.328  0.30( 0.30) 1.00   13472.9   11350.00
     6    19478.39   46.33    1.294  0.30( 0.30) 1.00   14438.1   10900.00
     7    19588.87   47.56    1.275  0.30( 0.30) 1.00   14945.1   11300.00
     8    19706.61   49.20    1.249  0.30( 0.30) 1.00   15597.1   11130.00
     9    19647.62   49.85    1.239  0.30( 0.30) 1.00   15786.1   11220.00
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    10    18903.90   61.66    1.108  0.30( 0.30) 1.00   19070.3   10600.00
    11    18643.77   66.60    1.080  0.30( 0.30) 1.00   20447.8   11111.00
    12    18601.49   67.44    1.076  0.30( 0.30) 1.00   20664.3   11201.00
    13    18514.96   68.81    1.068  0.30( 0.30) 1.00   20956.4   10500.00
    14    18268.54   73.16    1.044  0.30( 0.30) 1.00   21815.5   10710.00
    15    18070.77   75.36    1.032  0.30( 0.30) 1.00   22165.9   10410.00
    16    17837.43   79.96    1.007  0.30( 0.30) 1.00   22841.1   10700.00
    17    17517.46   86.50    0.970  0.30( 0.30) 1.00   23733.1   10400.00
    18    17330.56   89.03    0.956  0.30( 0.30) 1.00   24021.6   10200.00
    19    16826.61   95.12    0.933  0.30( 0.30) 1.00   24615.9   10300.00
    20    16328.75   99.85    0.916  0.30( 0.30) 1.00   24805.8   10210.00
    21    14203.45  127.38    0.828  0.30( 0.30) 1.00   25513.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   19706.61  Tc(MIN.) =   49.20
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =   15597.13

****************************************************************************
  FLOW PROCESS FROM NODE  11520.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   49.20
  RAINFALL INTENSITY(INCH/HR) =   1.25
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   15597.13
  TOTAL STREAM AREA(ACRES) =   25512.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   19706.61

****************************************************************************
  FLOW PROCESS FROM NODE  11530.00 TO NODE  11531.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   278.68
  ELEVATION DATA: UPSTREAM(FEET) =   1593.31  DOWNSTREAM(FEET) =   1523.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.844
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.835
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        1.18      0.30     1.000     0    8.84
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.75
  TOTAL AREA(ACRES) =      1.18   PEAK FLOW RATE(CFS) =      3.75

****************************************************************************
  FLOW PROCESS FROM NODE  11531.00 TO NODE  11532.00 IS CODE =  56
----------------------------------------------------------------------------
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1523.14  DOWNSTREAM(FEET) =   1297.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =   698.37   CHANNEL SLOPE =  0.3230
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.242
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.32      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.50
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   2.12
  Tc(MIN.) =   10.96
  SUBAREA AREA(ACRES) =     8.32       SUBAREA RUNOFF(CFS) =   22.03
  EFFECTIVE AREA(ACRES) =      9.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.5         PEAK FLOW RATE(CFS) =      25.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   6.64
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11532.00 =     977.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11532.00 TO NODE  11533.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1297.56  DOWNSTREAM(FEET) =   1134.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.17   CHANNEL SLOPE =  0.1693
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.842
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       18.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.74
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   2.38
  Tc(MIN.) =   13.34
  SUBAREA AREA(ACRES) =    18.50       SUBAREA RUNOFF(CFS) =   42.33
  EFFECTIVE AREA(ACRES) =     28.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.0         PEAK FLOW RATE(CFS) =      64.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   7.57
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11533.00 =    1939.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11533.00 TO NODE  11534.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1134.68  DOWNSTREAM(FEET) =   1002.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.78   CHANNEL SLOPE =  0.1379
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.40
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.564
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     164.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.62
  AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   1.66
  Tc(MIN.) =   15.00
  SUBAREA AREA(ACRES) =    98.44       SUBAREA RUNOFF(CFS) =  200.56
  EFFECTIVE AREA(ACRES) =    126.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      126.4         PEAK FLOW RATE(CFS) =     257.61
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.73   FLOW VELOCITY(FEET/SEC.) =  11.02
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11534.00 =    2896.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11534.00 TO NODE  11535.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1002.72  DOWNSTREAM(FEET) =    816.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2160.78   CHANNEL SLOPE =  0.0863
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.48
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.243
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     375.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.46
  AVERAGE FLOW DEPTH(FEET) =   2.42   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   18.44
  SUBAREA AREA(ACRES) =   134.87       SUBAREA RUNOFF(CFS) =  235.87
  EFFECTIVE AREA(ACRES) =    261.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      261.3         PEAK FLOW RATE(CFS) =     456.99
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.69   FLOW VELOCITY(FEET/SEC.) =  11.05
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11535.00 =    5056.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    816.20  DOWNSTREAM(FEET) =    577.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3109.20   CHANNEL SLOPE =  0.0767
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.98
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.923
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     514.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.96
  AVERAGE FLOW DEPTH(FEET) =   2.95   TRAVEL TIME(MIN.) =   4.73
  Tc(MIN.) =   23.17
  SUBAREA AREA(ACRES) =    78.24       SUBAREA RUNOFF(CFS) =  114.31
  EFFECTIVE AREA(ACRES) =    339.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      339.5         PEAK FLOW RATE(CFS) =     496.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.89   FLOW VELOCITY(FEET/SEC.) =  10.86
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11540.00 =    8165.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 23.17
RAINFALL INTENSITY(INCH/HR) = 1.92
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 339.55
TOTAL STREAM AREA(ACRES) = 339.55
PEAK FLOW RATE(CFS) AT CONFLUENCE = 496.08

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16064.83	21.35	2.024	0.30(0.30)	1.00	5661.7	11500.00
1	17191.95	30.75	1.573	0.30(0.30)	1.00	8271.5	11000.00
1	18984.35	42.12	1.359	0.30(0.30)	1.00	12629.9	11330.00
1	19164.55	43.31	1.341	0.30(0.30)	1.00	13121.1	10850.00
1	19286.39	44.15	1.328	0.30(0.30)	1.00	13472.9	11350.00
1	19478.39	46.33	1.294	0.30(0.30)	1.00	14438.1	10900.00
1	19588.87	47.56	1.275	0.30(0.30)	1.00	14945.1	11300.00
1	19706.61	49.20	1.249	0.30(0.30)	1.00	15597.1	11130.00
1	19647.62	49.85	1.239	0.30(0.30)	1.00	15786.1	11220.00
1	18903.90	61.66	1.108	0.30(0.30)	1.00	19070.3	10600.00
1	18643.77	66.60	1.080	0.30(0.30)	1.00	20447.8	11111.00
1	18601.49	67.44	1.076	0.30(0.30)	1.00	20664.3	11201.00
1	18514.96	68.81	1.068	0.30(0.30)	1.00	20956.4	10500.00
1	18268.54	73.16	1.044	0.30(0.30)	1.00	21815.5	10710.00
1	18070.77	75.36	1.032	0.30(0.30)	1.00	22165.9	10410.00
1	17837.43	79.96	1.007	0.30(0.30)	1.00	22841.1	10700.00
1	17517.46	86.50	0.970	0.30(0.30)	1.00	23733.1	10400.00
1	17330.56	89.03	0.956	0.30(0.30)	1.00	24021.6	10200.00
1	16826.61	95.12	0.933	0.30(0.30)	1.00	24615.9	10300.00
1	16328.75	99.85	0.916	0.30(0.30)	1.00	24805.8	10210.00
1	14203.45	127.38	0.828	0.30(0.30)	1.00	25513.0	10100.00
2	496.08	23.17	1.923	0.30(0.30)	1.00	339.5	11530.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16550.24	21.35	2.024	0.30(0.30)	1.00	5974.6	11500.00
2	16778.92	23.17	1.923	0.30(0.30)	1.00	6506.0	11530.00
3	17581.08	30.75	1.573	0.30(0.30)	1.00	8611.0	11000.00
4	19308.04	42.12	1.359	0.30(0.30)	1.00	12969.4	11330.00
5	19482.60	43.31	1.341	0.30(0.30)	1.00	13460.6	10850.00
6	19600.48	44.15	1.328	0.30(0.30)	1.00	13812.4	11350.00
7	19782.13	46.33	1.294	0.30(0.30)	1.00	14777.7	10900.00
8	19886.80	47.56	1.275	0.30(0.30)	1.00	15284.7	11300.00
9	19996.76	49.20	1.249	0.30(0.30)	1.00	15936.7	11130.00
10	19934.67	49.85	1.239	0.30(0.30)	1.00	16125.6	11220.00
11	19150.79	61.66	1.108	0.30(0.30)	1.00	19409.8	10600.00
12	18882.29	66.60	1.080	0.30(0.30)	1.00	20787.4	11111.00
13	18838.61	67.44	1.076	0.30(0.30)	1.00	21003.9	11201.00
14	18749.76	68.81	1.068	0.30(0.30)	1.00	21295.9	10500.00
15	18495.98	73.16	1.044	0.30(0.30)	1.00	22155.0	10710.00
16	18294.49	75.36	1.032	0.30(0.30)	1.00	22505.5	10410.00

17	18053.37	79.96	1.007	0.30(0.30)	1.00	23180.6	10700.00
18	17722.34	86.50	0.970	0.30(0.30)	1.00	24072.7	10400.00
19	17531.17	89.03	0.956	0.30(0.30)	1.00	24361.2	10200.00
20	17019.99	95.12	0.933	0.30(0.30)	1.00	24955.5	10300.00
21	16516.97	99.85	0.916	0.30(0.30)	1.00	25145.4	10210.00
22	14364.83	127.38	0.828	0.30(0.30)	1.00	25852.5	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 19996.76 Tc(MIN.) = 49.20
EFFECTIVE AREA(ACRES) = 15936.68 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25852.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

****
FLOW PROCESS FROM NODE 11540.00 TO NODE 11541.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 577.77 DOWNSTREAM(FEET) = 556.39
CHANNEL LENGTH THRU SUBAREA(FEET) = 2053.36 CHANNEL SLOPE = 0.0104
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.89
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.219
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	389.46	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20157.77
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.64
AVERAGE FLOW DEPTH(FEET) = 9.87 TRAVEL TIME(MIN.) = 2.34
Tc(MIN.) = 51.54
SUBAREA AREA(ACRES) = 389.46 SUBAREA RUNOFF(CFS) = 321.99
EFFECTIVE AREA(ACRES) = 16326.14 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 26242.0 PEAK FLOW RATE(CFS) = 19996.76
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.83 FLOW VELOCITY(FEET/SEC.) = 14.60
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11541.00 = 76797.15 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16550.24	23.82	1.887	0.30(0.30)	1.00	6364.1	11500.00
2	16778.92	25.63	1.793	0.30(0.30)	1.00	6895.5	11530.00
3	17581.08	33.18	1.526	0.30(0.30)	1.00	9000.5	11000.00
4	19308.04	44.48	1.323	0.30(0.30)	1.00	13358.9	11330.00
5	19482.60	45.67	1.304	0.30(0.30)	1.00	13850.1	10850.00
6	19600.48	46.50	1.291	0.30(0.30)	1.00	14201.9	11350.00

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      7    19782.13   48.68    1.258  0.30( 0.30) 1.00   15167.1   10900.00
      8    19886.80   49.90    1.239  0.30( 0.30) 1.00   15674.2   11300.00
      9    19996.76   51.54    1.219  0.30( 0.30) 1.00   16326.1   11130.00
     10    19934.67   52.19    1.211  0.30( 0.30) 1.00   16515.1   11220.00
     11    19150.79   64.03    1.095  0.30( 0.30) 1.00   19799.3   10600.00
     12    18882.29   68.98    1.067  0.30( 0.30) 1.00   21176.8   11111.00
     13    18838.61   69.82    1.063  0.30( 0.30) 1.00   21393.3   11201.00
     14    18749.76   71.19    1.055  0.30( 0.30) 1.00   21685.4   10500.00
     15    18495.98   75.55    1.031  0.30( 0.30) 1.00   22544.5   10710.00
     16    18294.49   77.76    1.019  0.30( 0.30) 1.00   22895.0   10410.00
     17    18053.37   82.37    0.993  0.30( 0.30) 1.00   23570.1   10700.00
     18    17722.34   88.93    0.957  0.30( 0.30) 1.00   24462.2   10400.00
     19    17531.17   91.46    0.946  0.30( 0.30) 1.00   24750.6   10200.00
     20    17019.99   97.58    0.924  0.30( 0.30) 1.00   25344.9   10300.00
     21    16516.97  102.33    0.907  0.30( 0.30) 1.00   25534.8   10210.00
     22    14364.83  129.96    0.822  0.30( 0.30) 1.00   26242.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   19996.76  Tc(MIN.) =   51.54
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =   16326.14

****************************************************************************
  FLOW PROCESS FROM NODE  11541.00 TO NODE  11542.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.39  DOWNSTREAM(FEET) =    523.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3267.94   CHANNEL SLOPE =  0.0101
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.95
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.173
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      330.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   20126.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.49
  AVERAGE FLOW DEPTH(FEET) =   9.94   TRAVEL TIME(MIN.) =   3.76
  Tc(MIN.) =   55.29
  SUBAREA AREA(ACRES) =   330.30       SUBAREA RUNOFF(CFS) =  259.68
  EFFECTIVE AREA(ACRES) =  16656.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26572.3         PEAK FLOW RATE(CFS) =   19996.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.90   FLOW VELOCITY(FEET/SEC.) =  14.47
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11542.00 =   80065.09 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16550.24   27.79    1.691  0.30( 0.30) 1.00    6694.4   11500.00
      2    16778.92   29.58    1.608  0.30( 0.30) 1.00    7225.8   11530.00
      3    17581.08   37.08    1.449  0.30( 0.30) 1.00    9330.8   11000.00
      4    19308.04   48.28    1.264  0.30( 0.30) 1.00   13689.2   11330.00
      5    19482.60   49.45    1.245  0.30( 0.30) 1.00   14180.4   10850.00
      6    19600.48   50.28    1.234  0.30( 0.30) 1.00   14532.2   11350.00
      7    19782.13   52.45    1.208  0.30( 0.30) 1.00   15497.4   10900.00
      8    19886.80   53.66    1.193  0.30( 0.30) 1.00   16004.5   11300.00
      9    19996.76   55.29    1.173  0.30( 0.30) 1.00   16656.4   11130.00
     10    19934.67   55.96    1.166  0.30( 0.30) 1.00   16845.4   11220.00
     11    19150.79   67.84    1.074  0.30( 0.30) 1.00   20129.6   10600.00
     12    18882.29   72.81    1.046  0.30( 0.30) 1.00   21507.1   11111.00
     13    18838.61   73.65    1.041  0.30( 0.30) 1.00   21723.6   11201.00
     14    18749.76   75.03    1.034  0.30( 0.30) 1.00   22015.7   10500.00
     15    18495.98   79.40    1.010  0.30( 0.30) 1.00   22874.8   10710.00
     16    18294.49   81.62    0.997  0.30( 0.30) 1.00   23225.3   10410.00
     17    18053.37   86.25    0.972  0.30( 0.30) 1.00   23900.4   10700.00
     18    17722.34   92.83    0.941  0.30( 0.30) 1.00   24792.5   10400.00
     19    17531.17   95.37    0.932  0.30( 0.30) 1.00   25080.9   10200.00
     20    17019.99  101.53    0.910  0.30( 0.30) 1.00   25675.2   10300.00
     21    16516.97  106.32    0.893  0.30( 0.30) 1.00   25865.1   10210.00
     22    14364.83  134.12    0.813  0.30( 0.30) 1.00   26572.3   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   19996.76  Tc(MIN.) =   55.29
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =   16656.44

****************************************************************************
  FLOW PROCESS FROM NODE  11542.00 TO NODE  11543.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    523.29  DOWNSTREAM(FEET) =    493.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2857.94   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.88
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.134
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      285.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   20103.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.62
  AVERAGE FLOW DEPTH(FEET) =   9.86   TRAVEL TIME(MIN.) =   3.26
  Tc(MIN.) =   58.55
  SUBAREA AREA(ACRES) =   285.11       SUBAREA RUNOFF(CFS) =  214.12
  EFFECTIVE AREA(ACRES) =  16941.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26857.4         PEAK FLOW RATE(CFS) =   19996.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.84
```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.84 FLOW VELOCITY(FEET/SEC.) = 14.59
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11543.00 = 82923.02 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16550.24	31.24	1.564	0.30(0.30)	1.00	6979.5	11500.00
2	16778.92	33.02	1.529	0.30(0.30)	1.00	7510.9	11530.00
3	17581.08	40.47	1.385	0.30(0.30)	1.00	9615.9	11000.00
4	19308.04	51.57	1.218	0.30(0.30)	1.00	13974.3	11330.00
5	19482.60	52.74	1.204	0.30(0.30)	1.00	14465.5	10850.00
6	19600.48	53.56	1.194	0.30(0.30)	1.00	14817.3	11350.00
7	19782.13	55.72	1.168	0.30(0.30)	1.00	15782.5	10900.00
8	19886.80	56.93	1.154	0.30(0.30)	1.00	16289.6	11300.00
9	19996.76	58.55	1.134	0.30(0.30)	1.00	16941.5	11130.00
10	19934.67	59.22	1.126	0.30(0.30)	1.00	17130.5	11220.00
11	19150.79	71.14	1.055	0.30(0.30)	1.00	20414.7	10600.00
12	18882.29	76.12	1.028	0.30(0.30)	1.00	21792.3	11111.00
13	18838.61	76.97	1.023	0.30(0.30)	1.00	22008.7	11201.00
14	18749.76	78.35	1.015	0.30(0.30)	1.00	22300.8	10500.00
15	18495.98	82.74	0.991	0.30(0.30)	1.00	23159.9	10710.00
16	18294.49	84.97	0.979	0.30(0.30)	1.00	23510.4	10410.00
17	18053.37	89.61	0.953	0.30(0.30)	1.00	24185.5	10700.00
18	17722.34	96.21	0.929	0.30(0.30)	1.00	25077.6	10400.00
19	17531.17	98.77	0.920	0.30(0.30)	1.00	25366.1	10200.00
20	17019.99	104.95	0.898	0.30(0.30)	1.00	25960.3	10300.00
21	16516.97	109.77	0.880	0.30(0.30)	1.00	26150.2	10210.00
22	14364.83	137.73	0.806	0.30(0.30)	1.00	26857.4	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 19996.76 Tc(MIN.) = 58.55
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 16941.54

****
FLOW PROCESS FROM NODE 11543.00 TO NODE 11544.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 493.61 DOWNSTREAM(FEET) = 480.21
CHANNEL LENGTH THRU SUBAREA(FEET) = 1963.01 CHANNEL SLOPE = 0.0068
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.07
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.111
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	303.63	0.30	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20108.07
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.62
AVERAGE FLOW DEPTH(FEET) = 11.05 TRAVEL TIME(MIN.) = 2.59
Tc(MIN.) = 61.15
SUBAREA AREA(ACRES) = 303.63 SUBAREA RUNOFF(CFS) = 222.61

EFFECTIVE AREA(ACRES) = 17245.18 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 27161.0 PEAK FLOW RATE(CFS) = 19996.76
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.01 FLOW VELOCITY(FEET/SEC.) = 12.60
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11544.00 = 84886.03 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16550.24	33.98	1.510	0.30(0.30)	1.00	7283.1	11500.00
2	16778.92	35.75	1.475	0.30(0.30)	1.00	7814.5	11530.00
3	17581.08	43.16	1.343	0.30(0.30)	1.00	9919.5	11000.00
4	19308.04	54.19	1.187	0.30(0.30)	1.00	14277.9	11330.00
5	19482.60	55.35	1.173	0.30(0.30)	1.00	14769.1	10850.00
6	19600.48	56.16	1.163	0.30(0.30)	1.00	15120.9	11350.00
7	19782.13	58.32	1.137	0.30(0.30)	1.00	16086.2	10900.00
8	19886.80	59.53	1.123	0.30(0.30)	1.00	16593.2	11300.00
9	19996.76	61.15	1.111	0.30(0.30)	1.00	17245.2	11130.00
10	19934.67	61.81	1.107	0.30(0.30)	1.00	17434.1	11220.00
11	19150.79	73.77	1.041	0.30(0.30)	1.00	20718.3	10600.00
12	18882.29	78.76	1.013	0.30(0.30)	1.00	22095.9	11111.00
13	18838.61	79.60	1.009	0.30(0.30)	1.00	22312.4	11201.00
14	18749.76	80.99	1.001	0.30(0.30)	1.00	22604.4	10500.00
15	18495.98	85.39	0.977	0.30(0.30)	1.00	23463.5	10710.00
16	18294.49	87.64	0.964	0.30(0.30)	1.00	23814.0	10410.00
17	18053.37	92.29	0.943	0.30(0.30)	1.00	24489.2	10700.00
18	17722.34	98.89	0.919	0.30(0.30)	1.00	25381.2	10400.00
19	17531.17	101.46	0.910	0.30(0.30)	1.00	25669.7	10200.00
20	17019.99	107.67	0.888	0.30(0.30)	1.00	26264.0	10300.00
21	16516.97	112.52	0.871	0.30(0.30)	1.00	26453.9	10210.00
22	14364.83	140.59	0.799	0.30(0.30)	1.00	27161.0	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 19996.76 Tc(MIN.) = 61.15
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 17245.18

****
FLOW PROCESS FROM NODE 11544.00 TO NODE 11545.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 480.21 DOWNSTREAM(FEET) = 456.90
CHANNEL LENGTH THRU SUBAREA(FEET) = 1914.49 CHANNEL SLOPE = 0.0122
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.44
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.099
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	184.16	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20063.00
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.44
AVERAGE FLOW DEPTH(FEET) = 9.43 TRAVEL TIME(MIN.) = 2.07
Tc(MIN.) = 63.21
SUBAREA AREA(ACRES) = 184.16 SUBAREA RUNOFF(CFS) = 132.48
EFFECTIVE AREA(ACRES) = 17429.34 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 27345.2 PEAK FLOW RATE(CFS) = 19996.76
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.42 FLOW VELOCITY(FEET/SEC.) = 15.42
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11545.00 = 86800.52 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16550.24	36.17	1.467	0.30(0.30)	1.00	7467.3	11500.00
2	16778.92	37.93	1.433	0.30(0.30)	1.00	7998.7	11530.00
3	17581.08	45.31	1.310	0.30(0.30)	1.00	10103.7	11000.00
4	19308.04	56.28	1.162	0.30(0.30)	1.00	14462.1	11330.00
5	19482.60	57.43	1.148	0.30(0.30)	1.00	14953.3	10850.00
6	19600.48	58.24	1.138	0.30(0.30)	1.00	15305.1	11350.00
7	19782.13	60.39	1.115	0.30(0.30)	1.00	16270.3	10900.00
8	19886.80	61.60	1.108	0.30(0.30)	1.00	16777.4	11300.00
9	19996.76	63.21	1.099	0.30(0.30)	1.00	17429.3	11130.00
10	19934.67	63.88	1.096	0.30(0.30)	1.00	17618.3	11220.00
11	19150.79	75.86	1.029	0.30(0.30)	1.00	20902.5	10600.00
12	18882.29	80.86	1.002	0.30(0.30)	1.00	22280.0	11111.00
13	18838.61	81.71	0.997	0.30(0.30)	1.00	22496.5	11201.00
14	18749.76	83.10	0.989	0.30(0.30)	1.00	22788.6	10500.00
15	18495.98	87.51	0.965	0.30(0.30)	1.00	23647.7	10710.00
16	18294.49	89.76	0.952	0.30(0.30)	1.00	23998.2	10410.00
17	18053.37	94.42	0.935	0.30(0.30)	1.00	24673.3	10700.00
18	17722.34	101.04	0.912	0.30(0.30)	1.00	25565.4	10400.00
19	17531.17	103.61	0.902	0.30(0.30)	1.00	25853.8	10200.00
20	17019.99	109.84	0.880	0.30(0.30)	1.00	26448.1	10300.00
21	16516.97	114.71	0.863	0.30(0.30)	1.00	26638.0	10210.00
22	14364.83	142.88	0.794	0.30(0.30)	1.00	27345.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 19996.76 Tc(MIN.) = 63.21
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 17429.34

****
FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 456.90 DOWNSTREAM(FEET) = 436.21
CHANNEL LENGTH THRU SUBAREA(FEET) = 2322.79 CHANNEL SLOPE = 0.0089
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.28
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.084
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	151.95	0.30	0.844	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.844
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20053.56
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.85
AVERAGE FLOW DEPTH(FEET) = 10.27 TRAVEL TIME(MIN.) = 2.80
Tc(MIN.) = 66.01
SUBAREA AREA(ACRES) = 151.95 SUBAREA RUNOFF(CFS) = 113.59
EFFECTIVE AREA(ACRES) = 17581.29 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 27497.1 PEAK FLOW RATE(CFS) = 19996.76
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.25 FLOW VELOCITY(FEET/SEC.) = 13.83
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16550.24	39.13	1.409	0.30(0.30)	1.00	7619.2	11500.00
2	16778.92	40.87	1.378	0.30(0.30)	1.00	8150.7	11530.00
3	17581.08	48.21	1.265	0.30(0.30)	1.00	10255.6	11000.00
4	19308.04	59.10	1.128	0.30(0.30)	1.00	14614.1	11330.00
5	19482.60	60.25	1.116	0.30(0.30)	1.00	15105.3	10850.00
6	19600.48	61.06	1.111	0.30(0.30)	1.00	15457.0	11350.00
7	19782.13	63.20	1.099	0.30(0.30)	1.00	16422.3	10900.00
8	19886.80	64.40	1.093	0.30(0.30)	1.00	16929.3	11300.00
9	19996.76	66.01	1.084	0.30(0.30)	1.00	17581.3	11130.00
10	19934.67	66.68	1.080	0.30(0.30)	1.00	17770.2	11220.00
11	19150.79	78.69	1.014	0.30(0.30)	1.00	21054.4	10600.00
12	18882.29	83.71	0.986	0.30(0.30)	1.00	22432.0	11111.00
13	18838.61	84.56	0.981	0.30(0.30)	1.00	22648.5	11201.00
14	18749.76	85.95	0.973	0.30(0.30)	1.00	22940.5	10500.00
15	18495.98	90.37	0.950	0.30(0.30)	1.00	23799.6	10710.00
16	18294.49	92.63	0.942	0.30(0.30)	1.00	24150.1	10410.00
17	18053.37	97.31	0.925	0.30(0.30)	1.00	24825.3	10700.00
18	17722.34	103.94	0.901	0.30(0.30)	1.00	25717.3	10400.00
19	17531.17	106.52	0.892	0.30(0.30)	1.00	26005.8	10200.00
20	17019.99	112.78	0.870	0.30(0.30)	1.00	26600.1	10300.00
21	16516.97	117.68	0.852	0.30(0.30)	1.00	26790.0	10210.00
22	14364.83	145.98	0.788	0.30(0.30)	1.00	27497.1	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 19996.76 Tc(MIN.) = 66.01
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 17581.29

==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 27497.1 TC(MIN.) = 66.01

EFFECTIVE AREA(ACRES) = 17581.29 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997
PEAK FLOW RATE(CFS) = 19996.76

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16550.24	39.13	1.409	0.30(0.30)	1.00	7619.2	11500.00
2	16778.92	40.87	1.378	0.30(0.30)	1.00	8150.7	11530.00
3	17581.08	48.21	1.265	0.30(0.30)	1.00	10255.6	11000.00
4	19308.04	59.10	1.128	0.30(0.30)	1.00	14614.1	11330.00
5	19482.60	60.25	1.116	0.30(0.30)	1.00	15105.3	10850.00
6	19600.48	61.06	1.111	0.30(0.30)	1.00	15457.0	11350.00
7	19782.13	63.20	1.099	0.30(0.30)	1.00	16422.3	10900.00
8	19886.80	64.40	1.093	0.30(0.30)	1.00	16929.3	11300.00
9	19996.76	66.01	1.084	0.30(0.30)	1.00	17581.3	11130.00
10	19934.67	66.68	1.080	0.30(0.30)	1.00	17770.2	11220.00
11	19150.79	78.69	1.014	0.30(0.30)	1.00	21054.4	10600.00
12	18882.29	83.71	0.986	0.30(0.30)	1.00	22432.0	11111.00
13	18838.61	84.56	0.981	0.30(0.30)	1.00	22648.5	11201.00
14	18749.76	85.95	0.973	0.30(0.30)	1.00	22940.5	10500.00
15	18495.98	90.37	0.950	0.30(0.30)	1.00	23799.6	10710.00
16	18294.49	92.63	0.942	0.30(0.30)	1.00	24150.1	10410.00
17	18053.37	97.31	0.925	0.30(0.30)	1.00	24825.3	10700.00
18	17722.34	103.94	0.901	0.30(0.30)	1.00	25717.3	10400.00
19	17531.17	106.52	0.892	0.30(0.30)	1.00	26005.8	10200.00
20	17019.99	112.78	0.870	0.30(0.30)	1.00	26600.1	10300.00
21	16516.97	117.68	0.852	0.30(0.30)	1.00	26790.0	10210.00
22	14364.83	145.98	0.788	0.30(0.30)	1.00	27497.1	10100.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S16.DAT
  TIME/DATE OF STUDY: 10:16 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.268
   2)   10.00;  3.404
   3)   15.00;  2.563
   4)   20.00;  2.098
   5)   25.00;  1.822
   6)   30.00;  1.588
   7)   40.00;  1.392
   8)   50.00;  1.237
   9)   60.00;  1.117
  10)   90.00;  0.951
  11)  120.00;  0.844
  12)  180.00;  0.714
  13)  360.00;  0.539
  14) 1440.00;  0.240
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11600.00 TO NODE  11601.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.21
  ELEVATION DATA: UPSTREAM(FEET) =   3061.08  DOWNSTREAM(FEET) =   2962.88

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.120
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.384
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        1.79      0.30     1.000     0   10.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.97
  TOTAL AREA(ACRES) =      1.79   PEAK FLOW RATE(CFS) =      4.97

************************************************************************
  FLOW PROCESS FROM NODE  11601.00 TO NODE  11602.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.88  DOWNSTREAM(FEET) =   2839.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =   548.33   CHANNEL SLOPE =  0.2252
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.033
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        4.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.38
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   2.09
  Tc(MIN.) =   12.21
  SUBAREA AREA(ACRES) =     4.88       SUBAREA RUNOFF(CFS) =   12.00
  EFFECTIVE AREA(ACRES) =      6.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =      16.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.30   FLOW VELOCITY(FEET/SEC.) =   5.12
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11602.00 =     938.54 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11602.00 TO NODE  11603.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2839.39  DOWNSTREAM(FEET) =   2697.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.87   CHANNEL SLOPE =  0.1452
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.614
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.54
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   14.70
  SUBAREA AREA(ACRES) =    31.42       SUBAREA RUNOFF(CFS) =   65.44
  EFFECTIVE AREA(ACRES) =     38.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.1         PEAK FLOW RATE(CFS) =      79.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   7.72
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11603.00 =    1915.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11603.00 TO NODE  11604.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2697.55  DOWNSTREAM(FEET) =   2598.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1887.15   CHANNEL SLOPE =  0.0523
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.143
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.03      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     139.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.53
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   4.81
  Tc(MIN.) =   19.51
  SUBAREA AREA(ACRES) =    72.03       SUBAREA RUNOFF(CFS) =  119.51
  EFFECTIVE AREA(ACRES) =    110.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =     182.71
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.87   FLOW VELOCITY(FEET/SEC.) =   7.09
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11604.00 =    3802.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11604.00 TO NODE  11605.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2598.90  DOWNSTREAM(FEET) =   2464.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2488.89   CHANNEL SLOPE =  0.0541
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.26
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.834
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     249.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.87
  AVERAGE FLOW DEPTH(FEET) =   2.20   TRAVEL TIME(MIN.) =   5.27
  Tc(MIN.) =   24.78
  SUBAREA AREA(ACRES) =    96.28       SUBAREA RUNOFF(CFS) =  132.94
  EFFECTIVE AREA(ACRES) =    206.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.4         PEAK FLOW RATE(CFS) =     284.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.36   FLOW VELOCITY(FEET/SEC.) =   8.19
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11605.00 =    6291.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11605.00 TO NODE  11606.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.25  DOWNSTREAM(FEET) =   2359.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1936.71   CHANNEL SLOPE =  0.0538
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.09
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.670
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      266.26      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     449.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.29
  AVERAGE FLOW DEPTH(FEET) =   3.02   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   28.26
  SUBAREA AREA(ACRES) =   266.26       SUBAREA RUNOFF(CFS) =  328.23
  EFFECTIVE AREA(ACRES) =    472.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      472.7         PEAK FLOW RATE(CFS) =     582.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.45   FLOW VELOCITY(FEET/SEC.) =   9.99
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11606.00 =    8228.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11606.00 TO NODE  11607.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2359.99  DOWNSTREAM(FEET) =   1905.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3829.49   CHANNEL SLOPE =  0.1188
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.531
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     656.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.74
  AVERAGE FLOW DEPTH(FEET) =   2.99   TRAVEL TIME(MIN.) =   4.64
  Tc(MIN.) =   32.90
  SUBAREA AREA(ACRES) =   132.44       SUBAREA RUNOFF(CFS) =  146.76
  EFFECTIVE AREA(ACRES) =    605.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      605.1         PEAK FLOW RATE(CFS) =     670.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.02   FLOW VELOCITY(FEET/SEC.) =  13.82
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11607.00 =   12057.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11607.00 TO NODE  11608.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   1905.15  DOWNSTREAM(FEET) =   1717.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1095.02   CHANNEL SLOPE =  0.1710
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.84
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.509
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       76.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     712.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.03
  AVERAGE FLOW DEPTH(FEET) =   2.84   TRAVEL TIME(MIN.) =   1.14
  Tc(MIN.) =   34.04
  SUBAREA AREA(ACRES) =    76.91       SUBAREA RUNOFF(CFS) =   83.68
  EFFECTIVE AREA(ACRES) =    682.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      682.0         PEAK FLOW RATE(CFS) =     742.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.90   FLOW VELOCITY(FEET/SEC.) =  16.22
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11608.00 =   13152.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11608.00 TO NODE  11609.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1717.92  DOWNSTREAM(FEET) =   1516.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1480.24   CHANNEL SLOPE =  0.1362
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.478
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     916.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.85
  AVERAGE FLOW DEPTH(FEET) =   3.43   TRAVEL TIME(MIN.) =   1.56
  Tc(MIN.) =   35.59
  SUBAREA AREA(ACRES) =   328.91       SUBAREA RUNOFF(CFS) =  348.83
  EFFECTIVE AREA(ACRES) =   1010.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1010.9         PEAK FLOW RATE(CFS) =    1072.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.72
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.72   FLOW VELOCITY(FEET/SEC.) =  16.54
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11609.00 =   14632.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11609.00 TO NODE  11610.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1516.24  DOWNSTREAM(FEET) =   1332.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.38   CHANNEL SLOPE =  0.0957
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.41
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.437
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      355.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1253.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.17
  AVERAGE FLOW DEPTH(FEET) =   4.40   TRAVEL TIME(MIN.) =   2.12
  Tc(MIN.) =   37.71
  SUBAREA AREA(ACRES) =   355.16       SUBAREA RUNOFF(CFS) =  363.42
  EFFECTIVE AREA(ACRES) =   1366.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1366.1          PEAK FLOW RATE(CFS) =    1397.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.64   FLOW VELOCITY(FEET/SEC.) =  15.62
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11610.00 =   16558.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11610.00 TO NODE  11611.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1332.01  DOWNSTREAM(FEET) =   1105.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2901.03   CHANNEL SLOPE =  0.0781
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.08
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.377
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      234.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1511.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.80
```



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  AVERAGE FLOW DEPTH(FEET) =   5.07   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   40.98
  SUBAREA AREA(ACRES) =   234.59       SUBAREA RUNOFF(CFS) =  227.37
  EFFECTIVE AREA(ACRES) =   1600.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1600.7          PEAK FLOW RATE(CFS) =    1551.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.14   FLOW VELOCITY(FEET/SEC.) =  14.89
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11611.00 =   19459.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11611.00 TO NODE  11612.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.34  DOWNSTREAM(FEET) =   1030.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1982.46   CHANNEL SLOPE =  0.0378
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.31
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.333
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1650.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.58
  AVERAGE FLOW DEPTH(FEET) =   6.30   TRAVEL TIME(MIN.) =   2.85
  Tc(MIN.) =   43.83
  SUBAREA AREA(ACRES) =   212.67       SUBAREA RUNOFF(CFS) =  197.66
  EFFECTIVE AREA(ACRES) =   1813.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1813.3          PEAK FLOW RATE(CFS) =    1685.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.37   FLOW VELOCITY(FEET/SEC.) =  11.64
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11612.00 =   21441.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.47  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3051.86   CHANNEL SLOPE =  0.0525
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.24
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.274
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      465.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1889.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.55
  AVERAGE FLOW DEPTH(FEET) =   6.22   TRAVEL TIME(MIN.) =   3.75
  Tc(MIN.) =   47.58
  SUBAREA AREA(ACRES) =   465.36       SUBAREA RUNOFF(CFS) =  408.15
  EFFECTIVE AREA(ACRES) =   2278.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2278.7         PEAK FLOW RATE(CFS) =    1998.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.38   FLOW VELOCITY(FEET/SEC.) =  13.75
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   47.58
  RAINFALL INTENSITY(INCH/HR) =   1.27
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2278.70
  TOTAL STREAM AREA(ACRES) =    2278.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1998.58

****************************************************************************
  FLOW PROCESS FROM NODE  11620.00 TO NODE  11621.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   266.64
  ELEVATION DATA: UPSTREAM(FEET) =   2567.03  DOWNSTREAM(FEET) =   2486.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.387
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.005
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        0.69      0.30     1.000     0    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.30
  TOTAL AREA(ACRES) =      0.69   PEAK FLOW RATE(CFS) =      2.30

****************************************************************************
  FLOW PROCESS FROM NODE  11621.00 TO NODE  11622.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2486.90  DOWNSTREAM(FEET) =   2424.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   712.48   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.928
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.67
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   4.44
  Tc(MIN.) =   12.83
  SUBAREA AREA(ACRES) =     3.63       SUBAREA RUNOFF(CFS) =    8.59
  EFFECTIVE AREA(ACRES) =      4.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.3         PEAK FLOW RATE(CFS) =      10.22
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.30   FLOW VELOCITY(FEET/SEC.) =   3.19
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11622.00 =     979.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11622.00 TO NODE  11623.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2424.91  DOWNSTREAM(FEET) =   2351.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.46   CHANNEL SLOPE =  0.0751
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.391
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.05
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  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   4.02
  Tc(MIN.) =   16.85
  SUBAREA AREA(ACRES) =    13.42       SUBAREA RUNOFF(CFS) =   25.25
  EFFECTIVE AREA(ACRES) =     17.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.7         PEAK FLOW RATE(CFS) =      33.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   4.64
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11623.00 =    1956.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11623.00 TO NODE  11624.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2351.48  DOWNSTREAM(FEET) =   2317.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.96   CHANNEL SLOPE =  0.0355
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.055
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.03
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   3.92
  Tc(MIN.) =   20.77
  SUBAREA AREA(ACRES) =    16.02       SUBAREA RUNOFF(CFS) =   25.31
  EFFECTIVE AREA(ACRES) =     33.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.8         PEAK FLOW RATE(CFS) =      53.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =   4.23
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.00 =    2904.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.00 TO NODE  11624.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2317.87  DOWNSTREAM(FEET) =   2292.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   758.23   CHANNEL SLOPE =  0.0337
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



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  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.906
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.93      0.30     0.984     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.67
  AVERAGE FLOW DEPTH(FEET) =   1.31   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   23.48
  SUBAREA AREA(ACRES) =    32.93       SUBAREA RUNOFF(CFS) =   47.74
  EFFECTIVE AREA(ACRES) =     66.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =      96.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   5.01
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.50 =    3662.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.50 TO NODE  11625.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2292.33  DOWNSTREAM(FEET) =   2256.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1098.98   CHANNEL SLOPE =  0.0325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.734
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       48.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     127.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.40
  AVERAGE FLOW DEPTH(FEET) =   1.75   TRAVEL TIME(MIN.) =   3.39
  Tc(MIN.) =   26.87
  SUBAREA AREA(ACRES) =    48.16       SUBAREA RUNOFF(CFS) =   62.18
  EFFECTIVE AREA(ACRES) =    114.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.9         PEAK FLOW RATE(CFS) =     148.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.90   FLOW VELOCITY(FEET/SEC.) =   5.64
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11625.00 =    4761.75 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11625.00 TO NODE  11626.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2256.59  DOWNSTREAM(FEET) =   2104.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.93   CHANNEL SLOPE =  0.0739
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.575
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.15      0.30     0.950     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.950
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     271.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.01
  AVERAGE FLOW DEPTH(FEET) =   2.12   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   30.68
  SUBAREA AREA(ACRES) =   212.15       SUBAREA RUNOFF(CFS) =  246.27
  EFFECTIVE AREA(ACRES) =    327.00     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      327.0         PEAK FLOW RATE(CFS) =     378.18
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.53   FLOW VELOCITY(FEET/SEC.) =   9.93
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11626.00 =    6818.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11626.00 TO NODE  11627.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2104.66  DOWNSTREAM(FEET) =   1837.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2716.08   CHANNEL SLOPE =  0.0985
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.61
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.498
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     457.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.60
  AVERAGE FLOW DEPTH(FEET) =   2.60   TRAVEL TIME(MIN.) =   3.90
  Tc(MIN.) =   34.58
  SUBAREA AREA(ACRES) =   147.74       SUBAREA RUNOFF(CFS) =  159.34
  EFFECTIVE AREA(ACRES) =    474.74     AREA-AVERAGED Fm(INCH/HR) =   0.29
```



```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      474.7         PEAK FLOW RATE(CFS) =     515.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.76   FLOW VELOCITY(FEET/SEC.) =  12.00
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11627.00 =    9534.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11627.00 TO NODE  11628.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1837.03  DOWNSTREAM(FEET) =   1393.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2077.86   CHANNEL SLOPE =  0.2132
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.49
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.458
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      202.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     620.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.69
  AVERAGE FLOW DEPTH(FEET) =   2.48   TRAVEL TIME(MIN.) =   2.08
  Tc(MIN.) =   36.65
  SUBAREA AREA(ACRES) =   202.44       SUBAREA RUNOFF(CFS) =  210.92
  EFFECTIVE AREA(ACRES) =    677.18     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      677.2         PEAK FLOW RATE(CFS) =     708.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.67   FLOW VELOCITY(FEET/SEC.) =  17.32
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11628.00 =   11612.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11628.00 TO NODE  11629.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1393.93  DOWNSTREAM(FEET) =   1201.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2844.34   CHANNEL SLOPE =  0.0676
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.79
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.381
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      141.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     777.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.75
  AVERAGE FLOW DEPTH(FEET) =   3.77   TRAVEL TIME(MIN.) =   4.03
  Tc(MIN.) =   40.69
  SUBAREA AREA(ACRES) =   141.55       SUBAREA RUNOFF(CFS) =  137.77
  EFFECTIVE AREA(ACRES) =    818.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      818.7         PEAK FLOW RATE(CFS) =     799.85
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.83   FLOW VELOCITY(FEET/SEC.) =  11.84
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11629.00 =   14456.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1201.61  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3807.89   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.307
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      106.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     848.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.19
  AVERAGE FLOW DEPTH(FEET) =   3.70   TRAVEL TIME(MIN.) =   4.81
  Tc(MIN.) =   45.50
  SUBAREA AREA(ACRES) =   106.41       SUBAREA RUNOFF(CFS) =   96.42
  EFFECTIVE AREA(ACRES) =    925.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      925.1         PEAK FLOW RATE(CFS) =     841.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.68   FLOW VELOCITY(FEET/SEC.) =  13.16
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11630.00 =   18264.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   45.50
  RAINFALL INTENSITY(INCH/HR) =   1.31
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     925.14
  TOTAL STREAM AREA(ACRES) =     925.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     841.30

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1998.58   47.58    1.274  0.30( 0.30) 1.00    2278.7   11600.00
      2      841.30   45.50    1.307  0.30( 0.30) 0.99     925.1   11620.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2815.71   45.50    1.307  0.30( 0.30) 1.00    3104.1   11620.00
      2     2813.00   47.58    1.274  0.30( 0.30) 1.00    3203.8   11600.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2815.71    Tc(MIN.) =    45.50
  EFFECTIVE AREA(ACRES) =    3104.09   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3203.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3203.8  TC(MIN.) =     45.50
  EFFECTIVE AREA(ACRES) =   3104.09  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.996
  PEAK FLOW RATE(CFS)   =    2815.71

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2815.71   45.50    1.307  0.30( 0.30) 1.00    3104.1   11620.00
      2     2813.00   47.58    1.274  0.30( 0.30) 1.00    3203.8   11600.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S17.DAT
  TIME/DATE OF STUDY: 10:16 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.268
   2)   10.00;  3.404
   3)   15.00;  2.563
   4)   20.00;  2.098
   5)   25.00;  1.822
   6)   30.00;  1.588
   7)   40.00;  1.392
   8)   50.00;  1.237
   9)   60.00;  1.117
  10)   90.00;  0.951
  11)  120.00;  0.844
  12)  180.00;  0.714
  13)  360.00;  0.539
  14) 1440.00;  0.240
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11701.00 TO NODE  11702.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   291.79
  ELEVATION DATA: UPSTREAM(FEET) =   1581.05  DOWNSTREAM(FEET) =   1496.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.753
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.869
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.72      0.30     1.000     0    8.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.74
  TOTAL AREA(ACRES) =      2.72   PEAK FLOW RATE(CFS) =      8.74

**************************************************************************
  FLOW PROCESS FROM NODE  11702.00 TO NODE  11703.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1496.25  DOWNSTREAM(FEET) =   1254.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   563.54   CHANNEL SLOPE =  0.4293
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.387
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.98
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   1.34
  Tc(MIN.) =   10.10
  SUBAREA AREA(ACRES) =    10.12       SUBAREA RUNOFF(CFS) =   28.12
  EFFECTIVE AREA(ACRES) =     12.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.8          PEAK FLOW RATE(CFS) =      35.68
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   8.27
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11703.00 =     855.33 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11703.00 TO NODE  11704.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1254.33  DOWNSTREAM(FEET) =   1143.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.91   CHANNEL SLOPE =  0.1076
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.939
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      61.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.41
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   2.67
  Tc(MIN.) =   12.76
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   51.12
  EFFECTIVE AREA(ACRES) =     34.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.4         PEAK FLOW RATE(CFS) =      81.61
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   7.03
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11704.00 =    1881.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11704.00 TO NODE  11705.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1143.91  DOWNSTREAM(FEET) =    804.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1952.20   CHANNEL SLOPE =  0.1737
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.457
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     130.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.63
  AVERAGE FLOW DEPTH(FEET) =   1.11   TRAVEL TIME(MIN.) =   3.38
  Tc(MIN.) =   16.14
  SUBAREA AREA(ACRES) =    50.19       SUBAREA RUNOFF(CFS) =   97.43
  EFFECTIVE AREA(ACRES) =     84.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       84.6         PEAK FLOW RATE(CFS) =     164.13
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =  10.39
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11705.00 =    3833.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    804.90  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1056.71   CHANNEL SLOPE =  0.0753
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.252
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     178.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.01
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =   18.34
  SUBAREA AREA(ACRES) =    15.89       SUBAREA RUNOFF(CFS) =   27.92
  EFFECTIVE AREA(ACRES) =    100.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.4         PEAK FLOW RATE(CFS) =     176.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.66   FLOW VELOCITY(FEET/SEC.) =   7.98
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S16.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     2815.71   45.50  0.30( 0.30) 1.00    3104.1   11620.00
```

```
      2     2813.00   47.58  0.30( 0.30) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =     3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2815.71   45.50  0.30( 0.30) 1.00    3104.1   11620.00
      2     2813.00   47.58  0.30( 0.30) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =      3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.22  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3507.54   CHANNEL SLOPE =  0.0413
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.05
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.241
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      213.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2906.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.85
  AVERAGE FLOW DEPTH(FEET) =   8.04   TRAVEL TIME(MIN.) =   4.22
  Tc(MIN.) =   49.72
  SUBAREA AREA(ACRES) =   213.50       SUBAREA RUNOFF(CFS) =  180.89
  EFFECTIVE AREA(ACRES) =   3317.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3417.3         PEAK FLOW RATE(CFS) =    2815.71
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.93   FLOW VELOCITY(FEET/SEC.) =  13.73
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2815.71   49.72    1.241  0.30( 0.30) 1.00    3317.6   11620.00
      2     2818.40   51.81    1.215  0.30( 0.30) 1.00    3417.3   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2818.40  Tc(MIN.) =   51.81
```



```
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3417.34

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2815.71   49.72    1.241  0.30( 0.30) 1.00    3317.6   11620.00
      2     2818.40   51.81    1.215  0.30( 0.30) 1.00    3417.3   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      176.48   18.34    2.252  0.30( 0.30) 1.00     100.4   11701.00
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2329.36   18.34    2.252  0.30( 0.30) 1.00    1324.3   11701.00
      2     2900.81   49.72    1.241  0.30( 0.30) 1.00    3418.0   11620.00
      3     2901.15   51.81    1.215  0.30( 0.30) 1.00    3517.8   11600.00
    TOTAL AREA(ACRES) =      3517.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2901.15  Tc(MIN.) =   51.806
  EFFECTIVE AREA(ACRES) =   3517.78  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3517.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11721.00 TO NODE  11722.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    725.34  DOWNSTREAM(FEET) =    657.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1845.27   CHANNEL SLOPE =  0.0367
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.94
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.175
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      185.10      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2974.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.07
  AVERAGE FLOW DEPTH(FEET) =   2.93   TRAVEL TIME(MIN.) =   3.39
```

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  Tc(MIN.) =   55.20
  SUBAREA AREA(ACRES) =   185.10       SUBAREA RUNOFF(CFS) =  145.72
  EFFECTIVE AREA(ACRES) =   3702.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3702.9         PEAK FLOW RATE(CFS) =    2918.04
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.90   FLOW VELOCITY(FEET/SEC.) =   9.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11722.00 =   29846.45 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2329.36   21.97    1.989  0.30( 0.30) 1.00    1509.4   11701.00
      2     2920.41   53.12    1.200  0.30( 0.30) 1.00    3603.1   11620.00
      3     2918.04   55.20    1.175  0.30( 0.30) 1.00    3702.9   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2920.41  Tc(MIN.) =   53.12
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3603.13

****************************************************************************
  FLOW PROCESS FROM NODE  11722.00 TO NODE  11723.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.70  DOWNSTREAM(FEET) =    609.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1967.44   CHANNEL SLOPE =  0.0245
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.34
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      273.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3024.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.00
  AVERAGE FLOW DEPTH(FEET) =   3.34   TRAVEL TIME(MIN.) =   4.10
  Tc(MIN.) =   57.22
  SUBAREA AREA(ACRES) =   273.16       SUBAREA RUNOFF(CFS) =  209.08
  EFFECTIVE AREA(ACRES) =   3876.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3976.0         PEAK FLOW RATE(CFS) =    2969.94
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.30   FLOW VELOCITY(FEET/SEC.) =   7.95
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11723.00 =   31813.89 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2341.58   26.35    1.759  0.30( 0.30) 1.00    1782.5   11701.00
      2     2969.94   57.22    1.150  0.30( 0.30) 1.00    3876.3   11620.00
      3     2957.05   59.30    1.125  0.30( 0.30) 1.00    3976.0   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2969.94  Tc(MIN.) =   57.22
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3876.29

****************************************************************************
  FLOW PROCESS FROM NODE  11723.00 TO NODE  11724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    609.57  DOWNSTREAM(FEET) =    546.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2808.53   CHANNEL SLOPE =  0.0224
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.099
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      159.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3027.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.77
  AVERAGE FLOW DEPTH(FEET) =   3.43   TRAVEL TIME(MIN.) =   6.03
  Tc(MIN.) =   63.25
  SUBAREA AREA(ACRES) =   159.72       SUBAREA RUNOFF(CFS) =  114.87
  EFFECTIVE AREA(ACRES) =   4036.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4135.8         PEAK FLOW RATE(CFS) =    2969.94
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.39   FLOW VELOCITY(FEET/SEC.) =   7.71
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11724.00 =   34622.42 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2341.58   32.86    1.532  0.30( 0.30) 1.00    1942.2   11701.00
      2     2969.94   63.25    1.099  0.30( 0.30) 1.00    4036.0   11620.00
      3     2957.05   65.33    1.088  0.30( 0.30) 1.00    4135.8   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2969.94  Tc(MIN.) =   63.25
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    4036.01

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  11724.00 TO NODE  11725.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    546.77  DOWNSTREAM(FEET) =    483.75
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2921.33   CHANNEL SLOPE =  0.0216
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.46
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.064
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      134.67      0.30     0.917     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3017.75
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.66
 AVERAGE FLOW DEPTH(FEET) =   3.46   TRAVEL TIME(MIN.) =   6.35
 Tc(MIN.) =   69.60
 SUBAREA AREA(ACRES) =   134.67       SUBAREA RUNOFF(CFS) =   95.61
 EFFECTIVE AREA(ACRES) =   4170.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =     4270.4         PEAK FLOW RATE(CFS) =    2969.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.42

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.42   FLOW VELOCITY(FEET/SEC.) =   7.63
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11725.00 =   37543.75 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2341.58   39.73    1.397  0.30( 0.30) 0.99    2076.9   11701.00
     2     2969.94   69.60    1.064  0.30( 0.30) 0.99    4170.7   11620.00
     3     2957.05   71.68    1.052  0.30( 0.30) 0.99    4270.4   11600.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2969.94  Tc(MIN.) =   69.60
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4170.68

********************************************************************************
 FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    483.75  DOWNSTREAM(FEET) =    436.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2685.66   CHANNEL SLOPE =  0.0177
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.66
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.029
 SUBAREA LOSS RATE DATA(AMC  II):
```



```
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      121.44      0.30     0.986     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3010.03
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.18
 AVERAGE FLOW DEPTH(FEET) =   3.66   TRAVEL TIME(MIN.) =   6.23
 Tc(MIN.) =   75.83
 SUBAREA AREA(ACRES) =   121.44       SUBAREA RUNOFF(CFS) =   80.19
 EFFECTIVE AREA(ACRES) =   4292.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =     4391.9         PEAK FLOW RATE(CFS) =    2969.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.63

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.63   FLOW VELOCITY(FEET/SEC.) =   7.15
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2341.58   46.48    1.292  0.30( 0.30) 0.99    2198.3   11701.00
     2     2969.94   75.83    1.029  0.30( 0.30) 0.99    4292.1   11620.00
     3     2957.05   77.92    1.018  0.30( 0.30) 0.99    4391.9   11600.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2969.94  Tc(MIN.) =   75.83
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4292.12
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     4391.9  TC(MIN.) =     75.83
 EFFECTIVE AREA(ACRES) =   4292.12  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.994
 PEAK FLOW RATE(CFS)   =    2969.94

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2341.58   46.48    1.292  0.30( 0.30) 0.99    2198.3   11701.00
     2     2969.94   75.83    1.029  0.30( 0.30) 0.99    4292.1   11620.00
     3     2957.05   77.92    1.018  0.30( 0.30) 0.99    4391.9   11600.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:
```

FILE NAME: S18.DAT
TIME/DATE OF STUDY: 13:29 04/03/2013

==========

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
USER-DEFINED TABLED RAINFALL USED
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	5.231
2)	10.00;	3.383
3)	15.00;	2.551
4)	20.00;	2.089
5)	25.00;	1.815
6)	30.00;	1.584
7)	40.00;	1.387
8)	50.00;	1.232
9)	60.00;	1.112
10)	90.00;	0.946
11)	120.00;	0.839
12)	180.00;	0.708
13)	360.00;	0.533
14)	1440.00;	0.237

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****

FLOW PROCESS FROM NODE 11801.00 TO NODE 11802.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

==========

INITIAL SUBAREA FLOW-LENGTH(FEET) = 970.31
ELEVATION DATA: UPSTREAM(FEET) = 834.89 DOWNSTREAM(FEET) = 727.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 17.170
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.351
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	7.24	0.30	1.000	0	17.17

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 13.36
TOTAL AREA(ACRES) = 7.24 PEAK FLOW RATE(CFS) = 13.36

****

FLOW PROCESS FROM NODE 11802.00 TO NODE 11803.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 727.50 DOWNSTREAM(FEET) = 674.12
CHANNEL LENGTH THRU SUBAREA(FEET) = 968.10 CHANNEL SLOPE = 0.0551
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.70
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.026
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	22.08	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 30.59
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.05
AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 3.99
Tc(MIN.) = 21.16
SUBAREA AREA(ACRES) = 22.08 SUBAREA RUNOFF(CFS) = 34.29
EFFECTIVE AREA(ACRES) = 29.32 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 45.54
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.84 FLOW VELOCITY(FEET/SEC.) = 4.63
LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11803.00 = 1938.41 FEET.

****

FLOW PROCESS FROM NODE 11803.00 TO NODE 11804.00 IS CODE = 56

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    674.12  DOWNSTREAM(FEET) =    554.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.27   CHANNEL SLOPE =  0.0642
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.736
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      68.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.60
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   5.55
  Tc(MIN.) =   26.70
  SUBAREA AREA(ACRES) =    35.55       SUBAREA RUNOFF(CFS) =   45.96
  EFFECTIVE AREA(ACRES) =     64.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       64.9         PEAK FLOW RATE(CFS) =      83.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.14   FLOW VELOCITY(FEET/SEC.) =   5.98
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11804.00 =    3802.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    554.40  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1767.25   CHANNEL SLOPE =  0.0738
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.563
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     104.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.73
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   4.38
  Tc(MIN.) =   31.08
  SUBAREA AREA(ACRES) =    36.70       SUBAREA RUNOFF(CFS) =   41.71
  EFFECTIVE AREA(ACRES) =    101.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      101.6         PEAK FLOW RATE(CFS) =     115.43
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   6.94
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11821.00 =    5569.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S15.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    16550.24   39.13  0.30( 0.30) 1.00    7619.2   11500.00
      2    16778.92   40.87  0.30( 0.30) 1.00    8150.7   11530.00
      3    17581.08   48.21  0.30( 0.30) 1.00   10255.6   11000.00
      4    19308.04   59.10  0.30( 0.30) 1.00   14614.1   11330.00
      5    19600.48   61.06  0.30( 0.30) 1.00   15457.0   11350.00
      6    19782.13   63.20  0.30( 0.30) 1.00   16422.3   10900.00
      7    19886.80   64.40  0.30( 0.30) 1.00   16929.3   11300.00
      8    19996.76   66.01  0.30( 0.30) 1.00   17581.3   11130.00
      9    19150.79   78.69  0.30( 0.30) 1.00   21054.4   10600.00
     10    18882.29   83.71  0.30( 0.30) 1.00   22432.0   11111.00
     11    18838.61   84.56  0.30( 0.30) 1.00   22648.5   11201.00
     12    18749.76   85.95  0.30( 0.30) 1.00   22940.5   10500.00
     13    18495.98   90.37  0.30( 0.30) 1.00   23799.6   10710.00
     14    18294.49   92.63  0.30( 0.30) 1.00   24150.1   10410.00
     15    18053.37   97.31  0.30( 0.30) 1.00   24825.3   10700.00
     16    17722.34  103.94  0.30( 0.30) 1.00   25717.3   10400.00
     17    17531.17  106.52  0.30( 0.30) 1.00   26005.8   10200.00
     18    17019.99  112.78  0.30( 0.30) 1.00   26600.1   10300.00
     19    16516.97  117.68  0.30( 0.30) 1.00   26790.0   10210.00
     20    14364.83  145.98  0.30( 0.30) 1.00   27497.1   10100.00
    TOTAL AREA(ACRES) =    27497.1

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S17.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2341.58   46.48  0.30( 0.30) 0.99    2198.3   11701.00
      2     2969.94   75.83  0.30( 0.30) 0.99    4292.1   11620.00
      3     2957.05   77.92  0.30( 0.30) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =     4391.9
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     2341.58   46.48  0.30( 0.30) 0.99    2198.3   11701.00
      2     2969.94   75.83  0.30( 0.30) 0.99    4292.1   11620.00
      3     2957.05   77.92  0.30( 0.30) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =      4391.9

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2341.58   46.48    1.287  0.30( 0.30) 0.99    2198.3   11701.00
      2     2969.94   75.83    1.024  0.30( 0.30) 0.99    4292.1   11620.00
      3     2957.05   77.92    1.013  0.30( 0.30) 0.99    4391.9   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16550.24   39.13    1.404  0.30( 0.30) 1.00    7619.2   11500.00
      2    16778.92   40.87    1.373  0.30( 0.30) 1.00    8150.7   11530.00
      3    17581.08   48.21    1.260  0.30( 0.30) 1.00   10255.6   11000.00
      4    19308.04   59.10    1.123  0.30( 0.30) 1.00   14614.1   11330.00
      5    19600.48   61.06    1.106  0.30( 0.30) 1.00   15457.0   11350.00
      6    19782.13   63.20    1.094  0.30( 0.30) 1.00   16422.3   10900.00
      7    19886.80   64.40    1.088  0.30( 0.30) 1.00   16929.3   11300.00
      8    19996.76   66.01    1.079  0.30( 0.30) 1.00   17581.3   11130.00
      9    19150.79   78.69    1.009  0.30( 0.30) 1.00   21054.4   10600.00
     10    18882.29   83.71    0.981  0.30( 0.30) 1.00   22432.0   11111.00
     11    18838.61   84.56    0.976  0.30( 0.30) 1.00   22648.5   11201.00
     12    18749.76   85.95    0.968  0.30( 0.30) 1.00   22940.5   10500.00
     13    18495.98   90.37    0.945  0.30( 0.30) 1.00   23799.6   10710.00
     14    18294.49   92.63    0.937  0.30( 0.30) 1.00   24150.1   10410.00
     15    18053.37   97.31    0.920  0.30( 0.30) 1.00   24825.3   10700.00
     16    17722.34  103.94    0.896  0.30( 0.30) 1.00   25717.3   10400.00
     17    17531.17  106.52    0.887  0.30( 0.30) 1.00   26005.8   10200.00
     18    17019.99  112.78    0.865  0.30( 0.30) 1.00   26600.1   10300.00
     19    16516.97  117.68    0.847  0.30( 0.30) 1.00   26790.0   10210.00
     20    14364.83  145.98    0.782  0.30( 0.30) 1.00   27497.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    18755.89   39.13    1.404  0.30( 0.30) 0.99    9469.9   11500.00
```



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      2    19019.05   40.87    1.373  0.30( 0.30) 0.99   10084.0   11530.00
      3    19732.81   46.48    1.287  0.30( 0.30) 1.00   11955.8   11701.00
      4    19959.84   48.21    1.260  0.30( 0.30) 1.00   12577.9   11000.00
      5    21919.86   59.10    1.123  0.30( 0.30) 1.00   17712.9   11330.00
      6    22254.14   61.06    1.106  0.30( 0.30) 1.00   18695.2   11350.00
      7    22481.60   63.20    1.094  0.30( 0.30) 1.00   19813.1   10900.00
      8    22611.94   64.40    1.088  0.30( 0.30) 1.00   20405.7   11300.00
      9    22756.40   66.01    1.079  0.30( 0.30) 1.00   21172.6   11130.00
     10    22311.44   75.83    1.024  0.30( 0.30) 1.00   24563.6   11620.00
     11    22159.65   77.92    1.013  0.30( 0.30) 1.00   25233.6   11600.00
     12    22090.04   78.69    1.009  0.30( 0.30) 1.00   25446.3   10600.00
     13    21706.73   83.71    0.981  0.30( 0.30) 1.00   26823.9   11111.00
     14    21643.61   84.56    0.976  0.30( 0.30) 1.00   27040.3   11201.00
     15    21522.80   85.95    0.968  0.30( 0.30) 1.00   27332.4   10500.00
     16    21170.88   90.37    0.945  0.30( 0.30) 1.00   28191.5   10710.00
     17    20935.97   92.63    0.937  0.30( 0.30) 1.00   28542.0   10410.00
     18    20625.88   97.31    0.920  0.30( 0.30) 1.00   29217.1   10700.00
     19    20196.92  103.94    0.896  0.30( 0.30) 1.00   30109.2   10400.00
     20    19967.63  106.52    0.887  0.30( 0.30) 1.00   30397.7   10200.00
     21    19364.13  112.78    0.865  0.30( 0.30) 1.00   30992.0   10300.00
     22    18788.84  117.68    0.847  0.30( 0.30) 1.00   31181.8   10210.00
     23    16367.69  145.98    0.782  0.30( 0.30) 1.00   31889.0   10100.00
    TOTAL AREA(ACRES) =     31889.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    22756.40  Tc(MIN.) =   66.008
  EFFECTIVE AREA(ACRES) =  21172.64  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    31889.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11726.00 TO NODE  11821.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.21  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1621.39   CHANNEL SLOPE =  0.0076
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.49
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.068
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       59.69      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22777.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.59
  AVERAGE FLOW DEPTH(FEET) =  11.49   TRAVEL TIME(MIN.) =   1.99
  Tc(MIN.) =   68.00
  SUBAREA AREA(ACRES) =    59.69       SUBAREA RUNOFF(CFS) =   41.25
  EFFECTIVE AREA(ACRES) =  21232.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    31948.7         PEAK FLOW RATE(CFS) =   22756.40
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
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GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.49 FLOW VELOCITY(FEET/SEC.) = 13.58
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18755.89	41.23	1.368	0.30(0.30)	0.99	9529.6	11500.00
2	19019.05	42.97	1.341	0.30(0.30)	0.99	10143.7	11530.00
3	19732.81	48.55	1.254	0.30(0.30)	1.00	12015.5	11701.00
4	19959.84	50.28	1.229	0.30(0.30)	1.00	12637.6	11000.00
5	21919.86	61.11	1.106	0.30(0.30)	1.00	17772.6	11330.00
6	22254.14	63.06	1.095	0.30(0.30)	1.00	18754.9	11350.00
7	22481.60	65.19	1.083	0.30(0.30)	1.00	19872.8	10900.00
8	22611.94	66.39	1.077	0.30(0.30)	1.00	20465.4	11300.00
9	22756.40	68.00	1.068	0.30(0.30)	1.00	21232.3	11130.00
10	22311.44	77.83	1.013	0.30(0.30)	1.00	24623.3	11620.00
11	22159.65	79.92	1.002	0.30(0.30)	1.00	25293.2	11600.00
12	22090.04	80.70	0.997	0.30(0.30)	1.00	25506.0	10600.00
13	21706.73	85.73	0.970	0.30(0.30)	1.00	26883.6	11111.00
14	21643.61	86.57	0.965	0.30(0.30)	1.00	27100.0	11201.00
15	21522.80	87.97	0.957	0.30(0.30)	1.00	27392.1	10500.00
16	21170.88	92.40	0.937	0.30(0.30)	1.00	28251.2	10710.00
17	20935.97	94.67	0.929	0.30(0.30)	1.00	28601.7	10410.00
18	20625.88	99.35	0.913	0.30(0.30)	1.00	29276.8	10700.00
19	20196.92	106.00	0.889	0.30(0.30)	1.00	30168.9	10400.00
20	19967.63	108.59	0.880	0.30(0.30)	1.00	30457.4	10200.00
21	19364.13	114.87	0.857	0.30(0.30)	1.00	31051.7	10300.00
22	18788.84	119.78	0.840	0.30(0.30)	1.00	31241.5	10210.00
23	16367.69	148.17	0.777	0.30(0.30)	1.00	31948.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	115.43	31.08	1.563	0.30(0.30)	1.00	101.6	11801.00

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16828.60	31.08	1.563	0.30(0.30)	0.99	7284.8	11801.00
2	18853.52	41.23	1.368	0.30(0.30)	0.99	9631.1	11500.00
3	19114.21	42.97	1.341	0.30(0.30)	0.99	10245.3	11530.00
4	19820.06	48.55	1.254	0.30(0.30)	1.00	12117.0	11701.00
5	20044.74	50.28	1.229	0.30(0.30)	1.00	12739.1	11000.00
6	21993.53	61.11	1.106	0.30(0.30)	1.00	17874.1	11330.00
7	22326.82	63.06	1.095	0.30(0.30)	1.00	18856.5	11350.00

8	22553.20	65.19	1.083	0.30(0.30)	1.00	19974.4	10900.00
9	22682.95	66.39	1.077	0.30(0.30)	1.00	20567.0	11300.00
10	22826.59	68.00	1.068	0.30(0.30)	1.00	21333.9	11130.00
11	22376.65	77.83	1.013	0.30(0.30)	1.00	24724.8	11620.00
12	22223.81	79.92	1.002	0.30(0.30)	1.00	25394.8	11600.00
13	22153.80	80.70	0.997	0.30(0.30)	1.00	25607.6	10600.00
14	21767.95	85.73	0.970	0.30(0.30)	1.00	26985.1	11111.00
15	21704.40	86.57	0.965	0.30(0.30)	1.00	27201.6	11201.00
16	21582.88	87.97	0.957	0.30(0.30)	1.00	27493.7	10500.00
17	21229.15	92.40	0.937	0.30(0.30)	1.00	28352.8	10710.00
18	20993.50	94.67	0.929	0.30(0.30)	1.00	28703.2	10410.00
19	20681.89	99.35	0.913	0.30(0.30)	1.00	29378.4	10700.00
20	20250.77	106.00	0.889	0.30(0.30)	1.00	30270.4	10400.00
21	20020.62	108.59	0.880	0.30(0.30)	1.00	30558.9	10200.00
22	19415.09	114.87	0.857	0.30(0.30)	1.00	31153.2	10300.00
23	18838.19	119.78	0.840	0.30(0.30)	1.00	31343.1	10210.00
24	16411.35	148.17	0.777	0.30(0.30)	1.00	32050.3	10100.00

TOTAL AREA(ACRES) = 32050.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 22826.59 Tc(MIN.) = 67.997
EFFECTIVE AREA(ACRES) = 21333.90 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32050.3
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 423.93 DOWNSTREAM(FEET) = 402.38
CHANNEL LENGTH THRU SUBAREA(FEET) = 1912.90 CHANNEL SLOPE = 0.0113
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.25
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.055
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.91	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22895.15
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.38
AVERAGE FLOW DEPTH(FEET) = 7.25 TRAVEL TIME(MIN.) = 2.38
Tc(MIN.) = 70.38
SUBAREA AREA(ACRES) = 201.91 SUBAREA RUNOFF(CFS) = 137.13
EFFECTIVE AREA(ACRES) = 21535.81 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32252.2 PEAK FLOW RATE(CFS) = 22826.59
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

```
  DEPTH(FEET) =  7.23   FLOW VELOCITY(FEET/SEC.) =  13.37
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11822.00 =   92657.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    402.38  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2380.10   CHANNEL SLOPE =  0.0091
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.037
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22865.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.46
  AVERAGE FLOW DEPTH(FEET) =   7.70   TRAVEL TIME(MIN.) =   3.18
  Tc(MIN.) =   73.56
  SUBAREA AREA(ACRES) =   116.13       SUBAREA RUNOFF(CFS) =   77.03
  EFFECTIVE AREA(ACRES) =  21651.94     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    32368.3         PEAK FLOW RATE(CFS) =   22826.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.69   FLOW VELOCITY(FEET/SEC.) =  12.44
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   73.56
  RAINFALL INTENSITY(INCH/HR) =   1.04
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   21651.94
  TOTAL STREAM AREA(ACRES) =   32368.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   22826.59

****************************************************************************
  FLOW PROCESS FROM NODE  11831.00 TO NODE  11832.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
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```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.20
  ELEVATION DATA: UPSTREAM(FEET) =   1353.30  DOWNSTREAM(FEET) =   1280.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.179
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.056
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.76      0.30     1.000     0    8.18
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.57
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      2.57

****************************************************************************
  FLOW PROCESS FROM NODE  11832.00 TO NODE  11833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1280.02  DOWNSTREAM(FEET) =   1070.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   686.67   CHANNEL SLOPE =  0.3057
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.281
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.70
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   10.61
  SUBAREA AREA(ACRES) =     5.95       SUBAREA RUNOFF(CFS) =   15.96
  EFFECTIVE AREA(ACRES) =      6.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =      18.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   5.81
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11833.00 =     934.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11833.00 TO NODE  11834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
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```
 ELEVATION DATA: UPSTREAM(FEET) =   1070.08  DOWNSTREAM(FEET) =    913.56
 CHANNEL LENGTH THRU SUBAREA(FEET) =   977.36   CHANNEL SLOPE =  0.1601
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.64
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.866
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       23.21      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.95
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.53
 AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   2.49
 Tc(MIN.) =   13.11
 SUBAREA AREA(ACRES) =    23.21       SUBAREA RUNOFF(CFS) =   53.60
 EFFECTIVE AREA(ACRES) =     29.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       29.9         PEAK FLOW RATE(CFS) =      69.10
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   7.63
 LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11834.00 =    1912.23 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11834.00 TO NODE  11835.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    913.56  DOWNSTREAM(FEET) =    727.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.63   CHANNEL SLOPE =  0.0989
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.43
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.371
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       73.73      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     138.17
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.13
 AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   3.84
 Tc(MIN.) =   16.95
 SUBAREA AREA(ACRES) =    73.73       SUBAREA RUNOFF(CFS) =  137.42
 EFFECTIVE AREA(ACRES) =    103.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      103.7         PEAK FLOW RATE(CFS) =     193.18
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.62
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.62   FLOW VELOCITY(FEET/SEC.) =   9.00
 LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11835.00 =    3787.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11835.00 TO NODE  11836.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    727.99  DOWNSTREAM(FEET) =    611.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.64   CHANNEL SLOPE =  0.0615
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.26
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.050
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       93.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     266.78
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.41
 AVERAGE FLOW DEPTH(FEET) =   2.20   TRAVEL TIME(MIN.) =   3.76
 Tc(MIN.) =   20.71
 SUBAREA AREA(ACRES) =    93.31       SUBAREA RUNOFF(CFS) =  146.98
 EFFECTIVE AREA(ACRES) =    196.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      197.0         PEAK FLOW RATE(CFS) =     310.25
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.39

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.39   FLOW VELOCITY(FEET/SEC.) =   8.78
 LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11836.00 =    5684.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11836.00 TO NODE  11837.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    611.39  DOWNSTREAM(FEET) =    508.59
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2178.15   CHANNEL SLOPE =  0.0472
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.89
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.815
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       98.92      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     377.77
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.45
```

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  AVERAGE FLOW DEPTH(FEET) =   2.85   TRAVEL TIME(MIN.) =   4.30
  Tc(MIN.) =   25.01
  SUBAREA AREA(ACRES) =    98.92       SUBAREA RUNOFF(CFS) =  134.86
  EFFECTIVE AREA(ACRES) =    295.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      295.9         PEAK FLOW RATE(CFS) =     403.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.95   FLOW VELOCITY(FEET/SEC.) =   8.60
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11837.00 =    7862.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11837.00 TO NODE  11838.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    508.59  DOWNSTREAM(FEET) =    448.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1942.91   CHANNEL SLOPE =  0.0309
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.51
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.619
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     450.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.62
  AVERAGE FLOW DEPTH(FEET) =   3.48   TRAVEL TIME(MIN.) =   4.25
  Tc(MIN.) =   29.25
  SUBAREA AREA(ACRES) =    79.71       SUBAREA RUNOFF(CFS) =   94.59
  EFFECTIVE AREA(ACRES) =    375.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      375.6         PEAK FLOW RATE(CFS) =     445.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.47   FLOW VELOCITY(FEET/SEC.) =   7.59
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.00 =    9805.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.00 TO NODE  11838.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    448.50  DOWNSTREAM(FEET) =    420.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =   917.65   CHANNEL SLOPE =  0.0302
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



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  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.57
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.559
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     465.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.62
  AVERAGE FLOW DEPTH(FEET) =   3.57   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =   31.26
  SUBAREA AREA(ACRES) =    34.57       SUBAREA RUNOFF(CFS) =   39.18
  EFFECTIVE AREA(ACRES) =    410.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      410.2         PEAK FLOW RATE(CFS) =     464.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.57   FLOW VELOCITY(FEET/SEC.) =   7.61
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.50 =   10723.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    420.79  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1615.83   CHANNEL SLOPE =  0.0248
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.80
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.485
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.54      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     476.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.14
  AVERAGE FLOW DEPTH(FEET) =   3.79   TRAVEL TIME(MIN.) =   3.77
  Tc(MIN.) =   35.03
  SUBAREA AREA(ACRES) =    21.54       SUBAREA RUNOFF(CFS) =   22.97
  EFFECTIVE AREA(ACRES) =    431.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      431.7         PEAK FLOW RATE(CFS) =     464.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.75   FLOW VELOCITY(FEET/SEC.) =   7.09
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11841.00 =   12339.04 FEET.
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****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   35.03
  RAINFALL INTENSITY(INCH/HR) =   1.48
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     431.70
  TOTAL STREAM AREA(ACRES) =     431.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     464.84

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16828.60   37.25    1.441  0.30( 0.30) 0.99    7602.9   11801.00
      1    18853.52   47.17    1.276  0.30( 0.30) 0.99    9949.2   11500.00
      1    19114.21   48.88    1.249  0.30( 0.30) 1.00   10563.3   11530.00
      1    19820.06   54.39    1.179  0.30( 0.30) 1.00   12435.1   11701.00
      1    20044.74   56.10    1.159  0.30( 0.30) 1.00   13057.2   11000.00
      1    21993.53   66.75    1.075  0.30( 0.30) 1.00   18192.2   11330.00
      1    22326.82   68.67    1.064  0.30( 0.30) 1.00   19174.5   11350.00
      1    22553.20   70.79    1.052  0.30( 0.30) 1.00   20292.4   10900.00
      1    22682.95   71.97    1.046  0.30( 0.30) 1.00   20885.0   11300.00
      1    22826.59   73.56    1.037  0.30( 0.30) 1.00   21651.9   11130.00
      1    22376.65   83.44    0.982  0.30( 0.30) 1.00   25042.9   11620.00
      1    22223.81   85.54    0.971  0.30( 0.30) 1.00   25712.9   11600.00
      1    22153.80   86.33    0.966  0.30( 0.30) 1.00   25925.6   10600.00
      1    21767.95   91.38    0.941  0.30( 0.30) 1.00   27303.2   11111.00
      1    21704.40   92.24    0.938  0.30( 0.30) 1.00   27519.6   11201.00
      1    21582.88   93.65    0.933  0.30( 0.30) 1.00   27811.7   10500.00
      1    21229.15   98.11    0.917  0.30( 0.30) 1.00   28670.8   10710.00
      1    20993.50  100.40    0.909  0.30( 0.30) 1.00   29021.3   10410.00
      1    20681.89  105.11    0.892  0.30( 0.30) 1.00   29696.4   10700.00
      1    20250.77  111.80    0.868  0.30( 0.30) 1.00   30588.5   10400.00
      1    20020.62  114.41    0.859  0.30( 0.30) 1.00   30877.0   10200.00
      1    19415.09  120.75    0.837  0.30( 0.30) 1.00   31471.3   10300.00
      1    18838.19  125.73    0.826  0.30( 0.30) 1.00   31661.1   10210.00
      1    16411.35  154.40    0.764  0.30( 0.30) 1.00   32368.3   10100.00
      2      464.84   35.03    1.485  0.30( 0.30) 1.00     431.7   11831.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    16896.69   35.03    1.485  0.30( 0.30) 1.00    7582.0   11831.00
      2    17276.30   37.25    1.441  0.30( 0.30) 1.00    8034.6   11801.00
      3    19236.37   47.17    1.276  0.30( 0.30) 1.00   10380.9   11500.00
      4    19486.66   48.88    1.249  0.30( 0.30) 1.00   10995.0   11530.00
      5    20165.05   54.39    1.179  0.30( 0.30) 1.00   12866.8   11701.00
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      6    20381.69   56.10    1.159  0.30( 0.30) 1.00   13488.9   11000.00
      7    22297.46   66.75    1.075  0.30( 0.30) 1.00   18623.9   11330.00
      8    22626.58   68.67    1.064  0.30( 0.30) 1.00   19606.2   11350.00
      9    22848.36   70.79    1.052  0.30( 0.30) 1.00   20724.1   10900.00
     10    22975.54   71.97    1.046  0.30( 0.30) 1.00   21316.7   11300.00
     11    23115.72   73.56    1.037  0.30( 0.30) 1.00   22083.6   11130.00
     12    22644.35   83.44    0.982  0.30( 0.30) 1.00   25474.6   11620.00
     13    22486.94   85.54    0.971  0.30( 0.30) 1.00   26144.6   11600.00
     14    22415.23   86.33    0.966  0.30( 0.30) 1.00   26357.3   10600.00
     15    22019.47   91.38    0.941  0.30( 0.30) 1.00   27734.9   11111.00
     16    21954.72   92.24    0.938  0.30( 0.30) 1.00   27951.3   11201.00
     17    21831.23   93.65    0.933  0.30( 0.30) 1.00   28243.4   10500.00
     18    21471.26   98.11    0.917  0.30( 0.30) 1.00   29102.5   10710.00
     19    21232.41  100.40    0.909  0.30( 0.30) 1.00   29453.0   10410.00
     20    20914.20  105.11    0.892  0.30( 0.30) 1.00   30128.1   10700.00
     21    20473.72  111.80    0.868  0.30( 0.30) 1.00   31020.2   10400.00
     22    20239.92  114.41    0.859  0.30( 0.30) 1.00   31308.7   10200.00
     23    19625.92  120.75    0.837  0.30( 0.30) 1.00   31903.0   10300.00
     24    19044.77  125.73    0.826  0.30( 0.30) 1.00   32092.8   10210.00
     25    16593.36  154.40    0.764  0.30( 0.30) 1.00   32800.0   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   23115.72    Tc(MIN.) =    73.56
  EFFECTIVE AREA(ACRES) =   22083.64   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    32800.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  12527.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.74  DOWNSTREAM(FEET) =    347.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2830.43   CHANNEL SLOPE =  0.0118
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.21
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.018
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.59      0.30     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   23153.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.62
  AVERAGE FLOW DEPTH(FEET) =   7.21   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   77.03
  SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =   75.42
  EFFECTIVE AREA(ACRES) =  22200.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    32916.6         PEAK FLOW RATE(CFS) =   23115.72
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.20
```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.20 FLOW VELOCITY(FEET/SEC.) = 13.61
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 77.03
EFFECTIVE AREA(ACRES) = 22200.23 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997
PEAK FLOW RATE(CFS) = 23115.72

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16896.69	38.89	1.409	0.30(0.30)	1.00	7698.5	11831.00
2	17276.30	41.08	1.370	0.30(0.30)	1.00	8151.2	11801.00
3	19236.37	50.86	1.222	0.30(0.30)	1.00	10497.5	11500.00
4	19486.66	52.55	1.201	0.30(0.30)	1.00	11111.6	11530.00
5	20165.05	58.02	1.136	0.30(0.30)	1.00	12983.4	11701.00
6	20381.69	59.71	1.115	0.30(0.30)	1.00	13605.5	11000.00
7	22297.46	70.26	1.055	0.30(0.30)	1.00	18740.5	11330.00
8	22626.58	72.16	1.045	0.30(0.30)	1.00	19722.8	11350.00
9	22848.36	74.26	1.033	0.30(0.30)	1.00	20840.7	10900.00
10	22975.54	75.44	1.027	0.30(0.30)	1.00	21433.3	11300.00
11	23115.72	77.03	1.018	0.30(0.30)	1.00	22200.2	11130.00
12	22644.35	86.93	0.963	0.30(0.30)	1.00	25591.2	11620.00
13	22486.94	89.04	0.951	0.30(0.30)	1.00	26261.1	11600.00
14	22415.23	89.83	0.947	0.30(0.30)	1.00	26473.9	10600.00
15	22019.47	94.90	0.929	0.30(0.30)	1.00	27851.5	11111.00
16	21954.72	95.77	0.925	0.30(0.30)	1.00	28067.9	11201.00
17	21831.23	97.18	0.920	0.30(0.30)	1.00	28360.0	10500.00
18	21471.26	101.66	0.904	0.30(0.30)	1.00	29219.1	10710.00
19	21232.41	103.97	0.896	0.30(0.30)	1.00	29569.6	10410.00
20	20914.20	108.70	0.879	0.30(0.30)	1.00	30244.7	10700.00
21	20473.72	115.41	0.855	0.30(0.30)	1.00	31136.8	10400.00
22	20239.92	118.04	0.846	0.30(0.30)	1.00	31425.3	10200.00
23	19625.92	124.41	0.829	0.30(0.30)	1.00	32019.6	10300.00
24	19044.77	129.43	0.818	0.30(0.30)	1.00	32209.4	10210.00
25	16593.36	158.28	0.755	0.30(0.30)	1.00	32916.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S19.DAT
  TIME/DATE OF STUDY: 09:25 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.002
   2)   10.00;  3.253
   3)   15.00;  2.474
   4)   20.00;  2.039
   5)   25.00;  1.775
   6)   30.00;  1.555
   7)   40.00;  1.356
   8)   50.00;  1.203
   9)   60.00;  1.080
  10)   90.00;  0.912
  11)  120.00;  0.803
  12)  180.00;  0.672
  13)  360.00;  0.500
  14) 1200.00;  0.221
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11900.00 TO NODE  11901.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.79
  ELEVATION DATA: UPSTREAM(FEET) =   2369.48  DOWNSTREAM(FEET) =   2332.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.203
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.231
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"          -        1.62      0.30     0.999     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  SUBAREA RUNOFF(CFS) =      5.73
  TOTAL AREA(ACRES) =      1.62   PEAK FLOW RATE(CFS) =      5.73

**************************************************************************
  FLOW PROCESS FROM NODE  11901.00 TO NODE  11902.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2332.92  DOWNSTREAM(FEET) =   2297.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   664.26   CHANNEL SLOPE =  0.0530
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.53
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.158
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.35      0.30     0.906     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.25
  AVERAGE FLOW DEPTH(FEET) =   0.47   TRAVEL TIME(MIN.) =   3.41
  Tc(MIN.) =   10.61
  SUBAREA AREA(ACRES) =     8.35       SUBAREA RUNOFF(CFS) =   21.69
  EFFECTIVE AREA(ACRES) =      9.97     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =       10.0          PEAK FLOW RATE(CFS) =      25.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   3.76
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.00 =     960.05 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11902.00 TO NODE  11902.50 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2297.70  DOWNSTREAM(FEET) =   2263.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.77   CHANNEL SLOPE =  0.0369
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.21
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.623
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.48      0.30     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.51
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   14.05
  SUBAREA AREA(ACRES) =    34.48       SUBAREA RUNOFF(CFS) =   72.97
  EFFECTIVE AREA(ACRES) =     44.45     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.91
  TOTAL AREA(ACRES) =       44.5         PEAK FLOW RATE(CFS) =      94.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =   5.14
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.50 =    1888.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11902.50 TO NODE  11903.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.40  DOWNSTREAM(FEET) =   2252.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   895.50   CHANNEL SLOPE =  0.0126
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.19
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.210
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.65      0.30     0.958     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.958
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     114.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.75
  AVERAGE FLOW DEPTH(FEET) =   2.14   TRAVEL TIME(MIN.) =   3.98
  Tc(MIN.) =   18.03
  SUBAREA AREA(ACRES) =    23.65       SUBAREA RUNOFF(CFS) =   40.93
  EFFECTIVE AREA(ACRES) =     68.10     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       68.1         PEAK FLOW RATE(CFS) =     118.47
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.18   FLOW VELOCITY(FEET/SEC.) =   3.77
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11903.00 =    2784.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11903.00 TO NODE  11904.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2252.14  DOWNSTREAM(FEET) =   2186.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.35   CHANNEL SLOPE =  0.0343
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.07
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.859
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.53      0.30     0.961     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.961
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     167.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.96
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   5.38
  Tc(MIN.) =   23.41
  SUBAREA AREA(ACRES) =    68.53       SUBAREA RUNOFF(CFS) =   96.87
  EFFECTIVE AREA(ACRES) =    136.63     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      136.6         PEAK FLOW RATE(CFS) =     193.79
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.17   FLOW VELOCITY(FEET/SEC.) =   6.23
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11904.00 =    4708.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11904.00 TO NODE  11905.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2186.04  DOWNSTREAM(FEET) =   1957.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.87   CHANNEL SLOPE =  0.1187
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.73
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.706
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       63.15      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     233.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.17
  AVERAGE FLOW DEPTH(FEET) =   1.71   TRAVEL TIME(MIN.) =   3.16
  Tc(MIN.) =   26.57
  SUBAREA AREA(ACRES) =    63.15       SUBAREA RUNOFF(CFS) =   79.91
  EFFECTIVE AREA(ACRES) =    199.78     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      199.8         PEAK FLOW RATE(CFS) =     254.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.80   FLOW VELOCITY(FEET/SEC.) =  10.44
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11905.00 =    6635.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11905.00 TO NODE  11906.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1957.34  DOWNSTREAM(FEET) =   1244.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2498.96   CHANNEL SLOPE =  0.2854
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.57
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.583
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     303.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.95
  AVERAGE FLOW DEPTH(FEET) =   1.55   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   29.35
  SUBAREA AREA(ACRES) =    84.87       SUBAREA RUNOFF(CFS) =   98.04
  EFFECTIVE AREA(ACRES) =    284.65     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      284.6         PEAK FLOW RATE(CFS) =     330.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.63   FLOW VELOCITY(FEET/SEC.) =  15.33
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11906.00 =    9134.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   1244.16  DOWNSTREAM(FEET) =    873.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3370.75   CHANNEL SLOPE =  0.1098
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.49
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.474
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     436.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.89
  AVERAGE FLOW DEPTH(FEET) =   2.46   TRAVEL TIME(MIN.) =   4.72
  Tc(MIN.) =   34.08
  SUBAREA AREA(ACRES) =   199.43       SUBAREA RUNOFF(CFS) =  210.70
  EFFECTIVE AREA(ACRES) =    484.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      484.1         PEAK FLOW RATE(CFS) =     513.53
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.68   FLOW VELOCITY(FEET/SEC.) =  12.47
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11920.00 =   12505.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.08
  RAINFALL INTENSITY(INCH/HR) =   1.47
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98
  EFFECTIVE STREAM AREA(ACRES) =     484.08
  TOTAL STREAM AREA(ACRES) =     484.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     513.53

****************************************************************************
  FLOW PROCESS FROM NODE  11910.00 TO NODE  11911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   517.62
  ELEVATION DATA: UPSTREAM(FEET) =   2531.88  DOWNSTREAM(FEET) =   2441.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.185
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.913
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        3.46      0.30     1.000     0   12.19
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.14
  TOTAL AREA(ACRES) =      3.46   PEAK FLOW RATE(CFS) =      8.14

****************************************************************************
  FLOW PROCESS FROM NODE  11911.00 TO NODE  11912.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2441.33  DOWNSTREAM(FEET) =   2382.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   397.30   CHANNEL SLOPE =  0.1488
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.669
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        5.79      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.24
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.56
  Tc(MIN.) =   13.75
  SUBAREA AREA(ACRES) =     5.79       SUBAREA RUNOFF(CFS) =   12.35
  EFFECTIVE AREA(ACRES) =      9.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =      19.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   4.77
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11912.00 =     914.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11912.00 TO NODE  11913.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2382.20  DOWNSTREAM(FEET) =   2263.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1891.47   CHANNEL SLOPE =  0.0626
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.076
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       54.30      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.41
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =   5.83
  Tc(MIN.) =   19.58
  SUBAREA AREA(ACRES) =    54.30       SUBAREA RUNOFF(CFS) =   86.79
  EFFECTIVE AREA(ACRES) =     63.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       63.5          PEAK FLOW RATE(CFS) =     101.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.28   FLOW VELOCITY(FEET/SEC.) =   6.29
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11913.00 =    2806.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11913.00 TO NODE  11914.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.77  DOWNSTREAM(FEET) =   1845.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1957.31   CHANNEL SLOPE =  0.2138
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.15
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.902
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       65.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     148.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.79
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   3.02
  Tc(MIN.) =   22.60
  SUBAREA AREA(ACRES) =    65.14       SUBAREA RUNOFF(CFS) =   93.90
  EFFECTIVE AREA(ACRES) =    128.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      128.7          PEAK FLOW RATE(CFS) =     185.51
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.28   FLOW VELOCITY(FEET/SEC.) =  11.57
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11914.00 =    4763.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11914.00 TO NODE  11915.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1845.23  DOWNSTREAM(FEET) =   1557.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1686.78   CHANNEL SLOPE =  0.1708
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.58
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.774
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       78.52      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     237.62
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.60
 AVERAGE FLOW DEPTH(FEET) =   1.56   TRAVEL TIME(MIN.) =   2.42
 Tc(MIN.) =   25.03
 SUBAREA AREA(ACRES) =    78.52       SUBAREA RUNOFF(CFS) =  104.16
 EFFECTIVE AREA(ACRES) =    207.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      207.2          PEAK FLOW RATE(CFS) =     274.88
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.69

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.69   FLOW VELOCITY(FEET/SEC.) =  12.15
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11915.00 =    6450.48 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11915.00 TO NODE  11916.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1557.21  DOWNSTREAM(FEET) =   1403.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.39   CHANNEL SLOPE =  0.0806
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.27
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.630
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       70.48      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     317.07
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.73
 AVERAGE FLOW DEPTH(FEET) =   2.25   TRAVEL TIME(MIN.) =   3.27
 Tc(MIN.) =   28.30
 SUBAREA AREA(ACRES) =    70.48       SUBAREA RUNOFF(CFS) =   84.37
 EFFECTIVE AREA(ACRES) =    277.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      277.7          PEAK FLOW RATE(CFS) =     332.41
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.31
```



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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.31   FLOW VELOCITY(FEET/SEC.) =   9.86
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11916.00 =    8359.87 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11916.00 TO NODE  11917.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1403.38  DOWNSTREAM(FEET) =   1079.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1945.82   CHANNEL SLOPE =  0.1662
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.543
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      232.20      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     462.32
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.02
 AVERAGE FLOW DEPTH(FEET) =   2.27   TRAVEL TIME(MIN.) =   2.31
 Tc(MIN.) =   30.61
 SUBAREA AREA(ACRES) =   232.20       SUBAREA RUNOFF(CFS) =  259.75
 EFFECTIVE AREA(ACRES) =    509.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      509.9          PEAK FLOW RATE(CFS) =     570.39
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.54

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.54   FLOW VELOCITY(FEET/SEC.) =  14.91
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11917.00 =   10305.69 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1079.99  DOWNSTREAM(FEET) =    873.95
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2563.91   CHANNEL SLOPE =  0.0804
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.25
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.471
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      110.82      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     628.79
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.79
```

```
  AVERAGE FLOW DEPTH(FEET) =   3.24   TRAVEL TIME(MIN.) =   3.63
  Tc(MIN.) =   34.23
  SUBAREA AREA(ACRES) =   110.82       SUBAREA RUNOFF(CFS) =  116.77
  EFFECTIVE AREA(ACRES) =    620.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      620.7         PEAK FLOW RATE(CFS) =     654.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.30   FLOW VELOCITY(FEET/SEC.) =  11.94
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.23
  RAINFALL INTENSITY(INCH/HR) =   1.47
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     620.71
  TOTAL STREAM AREA(ACRES) =     620.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     654.06

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      513.53   34.08    1.474  0.30( 0.30) 0.98     484.1   11900.00
      2      654.06   34.23    1.471  0.30( 0.30) 1.00     620.7   11910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1166.34   34.08    1.474  0.30( 0.30) 0.99    1102.0   11900.00
      2     1166.24   34.23    1.471  0.30( 0.30) 0.99    1104.8   11910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1166.34    Tc(MIN.) =    34.08
  EFFECTIVE AREA(ACRES) =    1101.97   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     1104.8
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11920.00 TO NODE  11921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    873.95  DOWNSTREAM(FEET) =    827.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1417.25   CHANNEL SLOPE =  0.0325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.66
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.427
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      107.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1220.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.12
  AVERAGE FLOW DEPTH(FEET) =   5.66   TRAVEL TIME(MIN.) =   2.33
  Tc(MIN.) =   36.41
  SUBAREA AREA(ACRES) =   107.47       SUBAREA RUNOFF(CFS) =  109.05
  EFFECTIVE AREA(ACRES) =   1209.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1212.3         PEAK FLOW RATE(CFS) =    1229.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.68   FLOW VELOCITY(FEET/SEC.) =  10.13
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11921.00 =   14286.85 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1229.34   36.41    1.427  0.30( 0.30) 0.99    1209.4   11900.00
      2     1228.81   36.57    1.424  0.30( 0.30) 0.99    1212.3   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1229.34  Tc(MIN.) =   36.41
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1209.44

****************************************************************************
  FLOW PROCESS FROM NODE  11921.00 TO NODE  11922.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    827.94  DOWNSTREAM(FEET) =    753.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.43   CHANNEL SLOPE =  0.0394
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.78
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.372
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      344.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1395.41
```

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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.27
  AVERAGE FLOW DEPTH(FEET) =   5.76   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   39.20
  SUBAREA AREA(ACRES) =   344.27       SUBAREA RUNOFF(CFS) =  332.13
  EFFECTIVE AREA(ACRES) =   1553.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1556.5         PEAK FLOW RATE(CFS) =    1501.01
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.96   FLOW VELOCITY(FEET/SEC.) =  11.48
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11922.00 =   16173.28 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1501.01   39.20    1.372  0.30( 0.30) 1.00    1553.7   11900.00
      2     1499.37   39.36    1.369  0.30( 0.30) 1.00    1556.5   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1501.01  Tc(MIN.) =   39.20
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1553.71

****************************************************************************
  FLOW PROCESS FROM NODE  11922.00 TO NODE  11923.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    753.55  DOWNSTREAM(FEET) =    641.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.88   CHANNEL SLOPE =  0.0391
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.12
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.305
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.18      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1575.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.59
  AVERAGE FLOW DEPTH(FEET) =   6.11   TRAVEL TIME(MIN.) =   4.11
  Tc(MIN.) =   43.32
  SUBAREA AREA(ACRES) =   165.18       SUBAREA RUNOFF(CFS) =  149.46
  EFFECTIVE AREA(ACRES) =   1718.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1721.7         PEAK FLOW RATE(CFS) =    1557.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.08   FLOW VELOCITY(FEET/SEC.) =  11.57
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11923.00 =   19034.16 FEET.
```



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  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1557.36   43.32    1.305  0.30( 0.30) 1.00    1718.9   11900.00
      2     1556.23   43.47    1.303  0.30( 0.30) 1.00    1721.7   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1557.36  Tc(MIN.) =   43.32
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1718.89

****************************************************************************
  FLOW PROCESS FROM NODE  11923.00 TO NODE  11924.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    641.58  DOWNSTREAM(FEET) =    579.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1844.02   CHANNEL SLOPE =  0.0335
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.68
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.263
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      433.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1745.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.23
  AVERAGE FLOW DEPTH(FEET) =   6.66   TRAVEL TIME(MIN.) =   2.74
  Tc(MIN.) =   46.05
  SUBAREA AREA(ACRES) =   433.73       SUBAREA RUNOFF(CFS) =  376.10
  EFFECTIVE AREA(ACRES) =   2152.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2155.4         PEAK FLOW RATE(CFS) =    1868.68
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.88   FLOW VELOCITY(FEET/SEC.) =  11.43
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11924.00 =   20878.18 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1868.68   46.05    1.263  0.30( 0.30) 1.00    2152.6   11900.00
      2     1866.54   46.21    1.261  0.30( 0.30) 1.00    2155.4   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1868.68  Tc(MIN.) =   46.05
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2152.62

****************************************************************************
  FLOW PROCESS FROM NODE  11924.00 TO NODE  11925.00 IS CODE =  56
----------------------------------------------------------------------------
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    579.89  DOWNSTREAM(FEET) =    494.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2756.15   CHANNEL SLOPE =  0.0311
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.20
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.202
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      265.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1976.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.29
  AVERAGE FLOW DEPTH(FEET) =   7.18   TRAVEL TIME(MIN.) =   4.07
  Tc(MIN.) =   50.12
  SUBAREA AREA(ACRES) =   265.42       SUBAREA RUNOFF(CFS) =  215.37
  EFFECTIVE AREA(ACRES) =   2418.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2420.9         PEAK FLOW RATE(CFS) =    1964.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.16   FLOW VELOCITY(FEET/SEC.) =  11.28
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11925.00 =   23634.33 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1964.19   50.12    1.202  0.30( 0.30) 1.00    2418.0   11900.00
      2     1962.35   50.27    1.200  0.30( 0.30) 1.00    2420.9   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1964.19  Tc(MIN.) =   50.12
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2418.04

****************************************************************************
  FLOW PROCESS FROM NODE  11925.00 TO NODE  11926.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    494.12  DOWNSTREAM(FEET) =    458.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1922.70   CHANNEL SLOPE =  0.0186
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.15
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.159
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       97.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2001.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.35
  AVERAGE FLOW DEPTH(FEET) =   8.14   TRAVEL TIME(MIN.) =   3.43
  Tc(MIN.) =   53.55
  SUBAREA AREA(ACRES) =    97.46       SUBAREA RUNOFF(CFS) =   75.39
  EFFECTIVE AREA(ACRES) =   2515.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2518.3         PEAK FLOW RATE(CFS) =    1964.19
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.07   FLOW VELOCITY(FEET/SEC.) =   9.30
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11926.00 =   25557.03 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1964.19   53.55    1.159  0.30( 0.30) 1.00    2515.5   11900.00
      2     1962.35   53.70    1.157  0.30( 0.30) 1.00    2518.3   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1964.19  Tc(MIN.) =   53.55
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2515.50

****************************************************************************
  FLOW PROCESS FROM NODE  11926.00 TO NODE  11927.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    458.40  DOWNSTREAM(FEET) =    399.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2170.13   CHANNEL SLOPE =  0.0274
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.42
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.118
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1984.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.78
  AVERAGE FLOW DEPTH(FEET) =   7.41   TRAVEL TIME(MIN.) =   3.35
  Tc(MIN.) =   56.90
  SUBAREA AREA(ACRES) =    53.83       SUBAREA RUNOFF(CFS) =   39.64
  EFFECTIVE AREA(ACRES) =   2569.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2572.1         PEAK FLOW RATE(CFS) =    1964.19
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.38
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.38   FLOW VELOCITY(FEET/SEC.) =  10.75
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1964.19   56.90    1.118  0.30( 0.30) 1.00    2569.3   11900.00
      2     1962.35   57.06    1.116  0.30( 0.30) 1.00    2572.1   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1964.19  Tc(MIN.) =   56.90
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2569.33

****************************************************************************
  FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610401W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)         (ACRES)    NODE
      1      871.61   24.84  0.30( 0.30) 1.00     621.4   40120.00
      2      863.20   26.67  0.30( 0.30) 1.00     652.1   40100.00
    TOTAL AREA(ACRES) =      652.1

****************************************************************************
  FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1964.19   56.90    1.118  0.30( 0.30) 1.00    2569.3   11900.00
      2     1962.35   57.06    1.116  0.30( 0.30) 1.00    2572.1   11910.00
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      871.61   24.84    1.783  0.30( 0.30) 1.00     621.4   40120.00
      2      863.20   26.67    1.701  0.30( 0.30) 1.00     652.1   40100.00
  LONGEST FLOWPATH FROM NODE  40100.00 TO NODE  11927.00 =   10245.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2425.59   24.84    1.783  0.30( 0.30) 1.00    1743.1   40120.00
      2     2439.57   26.67    1.701  0.30( 0.30) 1.00    1856.4   40100.00
      3     2468.10   56.90    1.118  0.30( 0.30) 1.00    3221.4   11900.00
      4     2465.09   57.06    1.116  0.30( 0.30) 1.00    3224.2   11910.00
    TOTAL AREA(ACRES) =      3224.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
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  PEAK FLOW RATE(CFS) =     2468.10  Tc(MIN.) =   56.901
  EFFECTIVE AREA(ACRES) =   3221.40  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3224.2
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    399.00  DOWNSTREAM(FEET) =    384.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   986.26   CHANNEL SLOPE =  0.0152
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.37
  CHANNEL FLOW THRU SUBAREA(CFS) =    2468.10
  FLOW VELOCITY(FEET/SEC.) =   9.16   FLOW DEPTH(FEET) =   9.37
  TRAVEL TIME(MIN.) =   1.79   Tc(MIN.) =   58.70
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2425.59   26.65    1.703  0.30( 0.30) 1.00    1743.1   40120.00
      2     2439.57   28.47    1.622  0.30( 0.30) 1.00    1856.4   40100.00
      3     2468.10   58.70    1.096  0.30( 0.30) 1.00    3221.4   11900.00
      4     2465.09   58.85    1.094  0.30( 0.30) 1.00    3224.2   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2468.10  Tc(MIN.) =   58.70
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3221.40

****************************************************************************
  FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610402W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)         (ACRES)    NODE
      1       71.72   13.60  0.30( 0.30) 1.00      33.3   40200.00
    TOTAL AREA(ACRES) =       33.3

****************************************************************************
  FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      2425.59   26.65    1.703  0.30( 0.30) 1.00    1743.1   40120.00
     2      2439.57   28.47    1.622  0.30( 0.30) 1.00    1856.4   40100.00
     3      2468.10   58.70    1.096  0.30( 0.30) 1.00    3221.4   11900.00
     4      2465.09   58.85    1.094  0.30( 0.30) 1.00    3224.2   11910.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       71.72   13.60    2.693  0.30( 0.30) 1.00      33.3   40200.00
 LONGEST FLOWPATH FROM NODE  40200.00 TO NODE  11927.50 =    1999.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      2182.69   13.60    2.693  0.30( 0.30) 1.00     922.7   40200.00
     2      2467.63   26.65    1.703  0.30( 0.30) 1.00    1776.4   40120.00
     3      2479.20   28.47    1.622  0.30( 0.30) 1.00    1889.7   40100.00
     4      2491.96   58.70    1.096  0.30( 0.30) 1.00    3254.7   11900.00
     5      2488.89   58.85    1.094  0.30( 0.30) 1.00    3257.5   11910.00
   TOTAL AREA(ACRES) =      3257.5

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     2491.96  Tc(MIN.) =   58.696
 EFFECTIVE AREA(ACRES) =   3254.71  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3257.5
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11928.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    384.00  DOWNSTREAM(FEET) =    359.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   647.19   CHANNEL SLOPE =  0.0386
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.65
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.086
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -       78.01      0.30     0.984     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2519.72
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.03
 AVERAGE FLOW DEPTH(FEET) =   7.65   TRAVEL TIME(MIN.) =   0.83
 Tc(MIN.) =   59.52
 SUBAREA AREA(ACRES) =    78.01       SUBAREA RUNOFF(CFS) =   55.52
 EFFECTIVE AREA(ACRES) =   3332.72     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3335.5         PEAK FLOW RATE(CFS) =    2491.96
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 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.61

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.61   FLOW VELOCITY(FEET/SEC.) =  12.99
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11928.00 =   29360.61 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      2182.69   14.45    2.560  0.30( 0.30) 1.00    1000.7   40200.00
     2      2467.63   27.47    1.666  0.30( 0.30) 1.00    1854.4   40120.00
     3      2479.20   29.30    1.586  0.30( 0.30) 1.00    1967.7   40100.00
     4      2491.96   59.52    1.086  0.30( 0.30) 1.00    3332.7   11900.00
     5      2488.89   59.68    1.084  0.30( 0.30) 1.00    3335.5   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2491.96  Tc(MIN.) =   59.52
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3332.72

****************************************************************************
 FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    359.00  DOWNSTREAM(FEET) =    341.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1322.66   CHANNEL SLOPE =  0.0131
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.74
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.068
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -       8.18      0.30     0.890     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2494.91
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.69
 AVERAGE FLOW DEPTH(FEET) =   9.74   TRAVEL TIME(MIN.) =   2.54
 Tc(MIN.) =   62.06
 SUBAREA AREA(ACRES) =     8.18       SUBAREA RUNOFF(CFS) =    5.90
 EFFECTIVE AREA(ACRES) =   3340.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3343.7         PEAK FLOW RATE(CFS) =    2491.96
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.73

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.73   FLOW VELOCITY(FEET/SEC.) =   8.69
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11929.00 =   30683.27 FEET.

 ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2182.69	17.07	2.294	0.30(0.30)	1.00	1008.9	40200.00
2	2467.63	30.02	1.555	0.30(0.30)	1.00	1862.6	40120.00
3	2479.20	31.84	1.518	0.30(0.30)	1.00	1975.9	40100.00
4	2491.96	62.06	1.068	0.30(0.30)	1.00	3340.9	11900.00
5	2488.89	62.22	1.068	0.30(0.30)	1.00	3343.7	11910.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 2491.96 Tc(MIN.) = 62.06
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 3340.90

****
FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 10

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 11527.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S18.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16896.69	38.89	0.30(0.30)	1.00	7698.5	11831.00
2	17276.30	41.08	0.30(0.30)	1.00	8151.2	11801.00
3	19486.66	52.55	0.30(0.30)	1.00	11111.6	11530.00
4	20381.69	59.71	0.30(0.30)	1.00	13605.5	11000.00
5	22297.46	70.26	0.30(0.30)	1.00	18740.5	11330.00
6	22626.58	72.16	0.30(0.30)	1.00	19722.8	11350.00
7	22975.54	75.44	0.30(0.30)	1.00	21433.3	11300.00
8	23115.72	77.03	0.30(0.30)	1.00	22200.2	11130.00
9	22644.35	86.93	0.30(0.30)	1.00	25591.2	11620.00
10	22486.94	89.04	0.30(0.30)	1.00	26261.1	11600.00
11	22019.47	94.90	0.30(0.30)	1.00	27851.5	11111.00
12	21831.23	97.18	0.30(0.30)	1.00	28360.0	10500.00
13	21471.26	101.66	0.30(0.30)	1.00	29219.1	10710.00
14	21232.41	103.97	0.30(0.30)	1.00	29569.6	10410.00
15	20914.20	108.70	0.30(0.30)	1.00	30244.7	10700.00
16	20473.72	115.41	0.30(0.30)	1.00	31136.8	10400.00
17	20239.92	118.04	0.30(0.30)	1.00	31425.3	10200.00
18	19625.92	124.41	0.30(0.30)	1.00	32019.6	10300.00
19	19044.77	129.43	0.30(0.30)	1.00	32209.4	10210.00
20	16593.36	158.28	0.30(0.30)	1.00	32916.6	10100.00

TOTAL AREA(ACRES) = 32916.6

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========
MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S25.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5835.52	69.19	0.30(0.30)	0.99	6329.8	12500.00
2	6595.23	83.06	0.30(0.30)	0.99	8310.3	12300.00
3	6683.97	84.55	0.30(0.30)	0.98	8607.3	12330.00
4	6816.67	87.39	0.30(0.30)	0.98	9132.6	12410.00
5	6966.15	91.70	0.30(0.29)	0.98	9854.9	12400.00
6	7051.46	96.73	0.30(0.29)	0.98	10551.6	12211.00
7	7158.36	100.97	0.30(0.29)	0.98	11151.0	12201.00
8	7158.46	105.21	0.30(0.29)	0.98	11623.7	12111.00
9	7111.42	108.20	0.30(0.29)	0.98	11956.9	12231.00
10	7049.93	111.16	0.30(0.29)	0.98	12250.9	12101.10
11	7026.53	112.25	0.30(0.29)	0.98	12348.9	12261.00
12	6566.68	124.37	0.30(0.29)	0.98	13114.4	12010.00
13	6134.11	133.21	0.30(0.29)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 14.0

>>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5835.52	69.19	0.30(0.30)	0.99	6329.8	12500.00
2	6595.23	83.06	0.30(0.30)	0.99	8310.3	12300.00
3	6683.97	84.55	0.30(0.30)	0.98	8607.3	12330.00
4	6816.67	87.39	0.30(0.30)	0.98	9132.6	12410.00
5	6966.15	91.70	0.30(0.29)	0.98	9854.9	12400.00
6	7051.46	96.73	0.30(0.29)	0.98	10551.6	12211.00
7	7158.36	100.97	0.30(0.29)	0.98	11151.0	12201.00
8	7158.46	105.21	0.30(0.29)	0.98	11623.7	12111.00
9	7111.42	108.20	0.30(0.29)	0.98	11956.9	12231.00
10	7049.93	111.16	0.30(0.29)	0.98	12250.9	12101.10
11	7026.53	112.25	0.30(0.29)	0.98	12348.9	12261.00
12	6566.68	124.37	0.30(0.29)	0.98	13114.4	12010.00
13	6134.11	133.21	0.30(0.29)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5835.52	69.19	1.029	0.30(0.30)	0.99	6329.8	12500.00
2	6595.23	83.06	0.951	0.30(0.30)	0.99	8310.3	12300.00
3	6683.97	84.55	0.943	0.30(0.30)	0.98	8607.3	12330.00
4	6816.67	87.39	0.927	0.30(0.30)	0.98	9132.6	12410.00
5	6966.15	91.70	0.906	0.30(0.29)	0.98	9854.9	12400.00
6	7051.46	96.73	0.888	0.30(0.29)	0.98	10551.6	12211.00
7	7158.36	100.97	0.872	0.30(0.29)	0.98	11151.0	12201.00
8	7158.46	105.21	0.857	0.30(0.29)	0.98	11623.7	12111.00
9	7111.42	108.20	0.846	0.30(0.29)	0.98	11956.9	12231.00
10	7049.93	111.16	0.835	0.30(0.29)	0.98	12250.9	12101.10
11	7026.53	112.25	0.831	0.30(0.29)	0.98	12348.9	12261.00
12	6566.68	124.37	0.793	0.30(0.29)	0.98	13114.4	12010.00
13	6134.11	133.21	0.774	0.30(0.29)	0.98	13237.1	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16896.69	38.89	1.378	0.30(0.30)	1.00	7698.5	11831.00
2	17276.30	41.08	1.340	0.30(0.30)	1.00	8151.2	11801.00
3	19486.66	52.55	1.172	0.30(0.30)	1.00	11111.6	11530.00
4	20381.69	59.71	1.084	0.30(0.30)	1.00	13605.5	11000.00
5	22297.46	70.26	1.023	0.30(0.30)	1.00	18740.5	11330.00
6	22626.58	72.16	1.012	0.30(0.30)	1.00	19722.8	11350.00
7	22975.54	75.44	0.994	0.30(0.30)	1.00	21433.3	11300.00
8	23115.72	77.03	0.985	0.30(0.30)	1.00	22200.2	11130.00
9	22644.35	86.93	0.929	0.30(0.30)	1.00	25591.2	11620.00
10	22486.94	89.04	0.917	0.30(0.30)	1.00	26261.1	11600.00
11	22019.47	94.90	0.894	0.30(0.30)	1.00	27851.5	11111.00
12	21831.23	97.18	0.886	0.30(0.30)	1.00	28360.0	10500.00
13	21471.26	101.66	0.870	0.30(0.30)	1.00	29219.1	10710.00
14	21232.41	103.97	0.861	0.30(0.30)	1.00	29569.6	10410.00
15	20914.20	108.70	0.844	0.30(0.30)	1.00	30244.7	10700.00
16	20473.72	115.41	0.820	0.30(0.30)	1.00	31136.8	10400.00
17	20239.92	118.04	0.810	0.30(0.30)	1.00	31425.3	10200.00
18	19625.92	124.41	0.793	0.30(0.30)	1.00	32019.6	10300.00
19	19044.77	129.43	0.782	0.30(0.30)	1.00	32209.4	10210.00
20	16593.36	158.28	0.719	0.30(0.30)	1.00	32916.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21741.58	38.89	1.378	0.30(0.30)	0.99	11256.0	11831.00
2	22211.46	41.08	1.340	0.30(0.30)	0.99	11909.1	11801.00
3	24784.57	52.55	1.172	0.30(0.30)	0.99	15919.4	11530.00
4	25795.96	59.71	1.084	0.30(0.30)	0.99	19068.1	11000.00
5	27939.46	69.19	1.029	0.30(0.30)	0.99	24551.6	12500.00
6	28191.31	70.26	1.023	0.30(0.30)	0.99	25222.3	11330.00
7	28624.61	72.16	1.012	0.30(0.30)	0.99	26476.3	11350.00
8	29153.41	75.44	0.994	0.30(0.30)	0.99	28655.6	11300.00
9	29380.62	77.03	0.985	0.30(0.30)	0.99	29649.4	11130.00
10	29423.76	83.06	0.951	0.30(0.30)	0.99	32576.6	12300.00
11	29441.34	84.55	0.943	0.30(0.30)	0.99	33385.4	12330.00
12	29439.51	86.93	0.929	0.30(0.30)	0.99	34638.6	11620.00

13	29426.80	87.39	0.927	0.30(0.30)	0.99	34869.4	12410.00
14	29360.90	89.04	0.917	0.30(0.30)	0.99	35670.6	11600.00
15	29241.13	91.70	0.906	0.30(0.30)	0.99	36837.1	12400.00
16	29039.95	94.90	0.894	0.30(0.30)	0.99	38150.0	11111.00
17	28919.77	96.73	0.888	0.30(0.30)	0.99	38811.4	12211.00
18	28894.01	97.18	0.886	0.30(0.30)	0.99	38975.0	10500.00
19	28684.71	100.97	0.872	0.30(0.30)	0.99	40238.6	12201.00
20	28629.64	101.66	0.870	0.30(0.30)	0.99	40446.5	10710.00
21	28390.84	103.97	0.861	0.30(0.30)	0.99	41054.6	10410.00
22	28307.29	105.21	0.857	0.30(0.30)	0.99	41370.6	12111.00
23	28058.85	108.20	0.846	0.30(0.30)	0.99	42131.2	12231.00
24	28015.33	108.70	0.844	0.30(0.30)	0.99	42250.8	10700.00
25	27802.82	111.16	0.835	0.30(0.30)	0.99	42822.3	12101.10
26	27707.59	112.25	0.831	0.30(0.30)	0.99	43065.7	12261.00
27	27380.37	115.41	0.820	0.30(0.30)	0.99	43685.2	10400.00
28	27046.91	118.04	0.810	0.30(0.30)	0.99	44139.6	10200.00
29	26196.22	124.37	0.793	0.30(0.30)	0.99	45130.4	12010.00
30	26190.77	124.41	0.793	0.30(0.30)	0.99	45134.5	10300.00
31	25363.96	129.43	0.782	0.30(0.30)	0.99	45394.0	10210.00
32	24857.80	133.21	0.774	0.30(0.30)	0.99	45539.1	12000.00
33	22028.48	158.28	0.719	0.30(0.30)	0.99	46153.7	10100.00

TOTAL AREA(ACRES) = 46153.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 29441.34 Tc(MIN.) = 84.553
EFFECTIVE AREA(ACRES) = 33385.42 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46153.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

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FLOW PROCESS FROM NODE 12527.00 TO NODE 11929.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 347.47 DOWNSTREAM(FEET) = 341.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 532.38 CHANNEL SLOPE = 0.0110
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.43
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.939
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.37	0.30	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29445.50
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.43
AVERAGE FLOW DEPTH(FEET) = 8.43 TRAVEL TIME(MIN.) = 0.61
Tc(MIN.) = 85.17
SUBAREA AREA(ACRES) = 14.37 SUBAREA RUNOFF(CFS) = 8.32
EFFECTIVE AREA(ACRES) = 33399.79 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46168.0 PEAK FLOW RATE(CFS) = 29441.34
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.43 FLOW VELOCITY(FEET/SEC.) = 14.43
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21741.58	39.57	1.365	0.30(0.30)	0.99	11270.4	11831.00
2	22211.46	41.75	1.329	0.30(0.30)	0.99	11923.5	11801.00
3	24784.57	53.20	1.164	0.30(0.30)	0.99	15933.8	11530.00
4	25795.96	60.35	1.078	0.30(0.30)	0.99	19082.5	11000.00
5	27939.46	69.82	1.025	0.30(0.30)	0.99	24565.9	12500.00
6	28191.31	70.88	1.019	0.30(0.30)	0.99	25236.7	11330.00
7	28624.61	72.78	1.008	0.30(0.30)	0.99	26490.7	11350.00
8	29153.41	76.06	0.990	0.30(0.30)	0.99	28670.0	11300.00
9	29380.62	77.64	0.981	0.30(0.30)	0.99	29663.8	11130.00
10	29423.76	83.67	0.947	0.30(0.30)	0.99	32590.9	12300.00
11	29441.34	85.17	0.939	0.30(0.30)	0.99	33399.8	12330.00
12	29439.51	87.54	0.926	0.30(0.30)	0.99	34653.0	11620.00
13	29426.80	88.00	0.923	0.30(0.30)	0.99	34883.8	12410.00
14	29360.90	89.65	0.914	0.30(0.30)	0.99	35685.0	11600.00
15	29241.13	92.31	0.904	0.30(0.30)	0.99	36851.5	12400.00
16	29039.95	95.52	0.892	0.30(0.30)	0.99	38164.4	11111.00
17	28919.77	97.35	0.885	0.30(0.30)	0.99	38825.8	12211.00
18	28894.01	97.80	0.884	0.30(0.30)	0.99	38989.4	10500.00
19	28684.71	101.59	0.870	0.30(0.30)	0.99	40253.0	12201.00
20	28629.64	102.28	0.867	0.30(0.30)	0.99	40460.9	10710.00
21	28390.84	104.59	0.859	0.30(0.30)	0.99	41068.9	10410.00
22	28307.29	105.83	0.854	0.30(0.30)	0.99	41384.9	12111.00
23	28058.85	108.83	0.844	0.30(0.30)	0.99	42145.5	12231.00
24	28015.33	109.32	0.842	0.30(0.30)	0.99	42265.2	10700.00
25	27802.82	111.78	0.833	0.30(0.30)	0.99	42836.7	12101.10
26	27707.59	112.88	0.829	0.30(0.30)	0.99	43080.1	12261.00
27	27380.37	116.04	0.817	0.30(0.30)	0.99	43699.6	10400.00
28	27046.91	118.67	0.808	0.30(0.30)	0.99	44154.0	10200.00
29	26196.22	125.01	0.792	0.30(0.30)	0.99	45144.8	12010.00
30	26190.77	125.05	0.792	0.30(0.30)	0.99	45148.8	10300.00
31	25363.96	130.07	0.781	0.30(0.30)	0.99	45408.4	10210.00
32	24857.80	133.86	0.773	0.30(0.30)	0.99	45553.5	12000.00
33	22028.48	158.96	0.718	0.30(0.30)	0.99	46168.0	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 29441.34 Tc(MIN.) = 85.17
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33399.79

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FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21741.58	39.57	1.365	0.30(0.30)	0.99	11270.4	11831.00

2	22211.46	41.75	1.329	0.30(0.30)	0.99	11923.5	11801.00
3	24784.57	53.20	1.164	0.30(0.30)	0.99	15933.8	11530.00
4	25795.96	60.35	1.078	0.30(0.30)	0.99	19082.5	11000.00
5	27939.46	69.82	1.025	0.30(0.30)	0.99	24565.9	12500.00
6	28191.31	70.88	1.019	0.30(0.30)	0.99	25236.7	11330.00
7	28624.61	72.78	1.008	0.30(0.30)	0.99	26490.7	11350.00
8	29153.41	76.06	0.990	0.30(0.30)	0.99	28670.0	11300.00
9	29380.62	77.64	0.981	0.30(0.30)	0.99	29663.8	11130.00
10	29423.76	83.67	0.947	0.30(0.30)	0.99	32590.9	12300.00
11	29441.34	85.17	0.939	0.30(0.30)	0.99	33399.8	12330.00
12	29439.51	87.54	0.926	0.30(0.30)	0.99	34653.0	11620.00
13	29426.80	88.00	0.923	0.30(0.30)	0.99	34883.8	12410.00
14	29360.90	89.65	0.914	0.30(0.30)	0.99	35685.0	11600.00
15	29241.13	92.31	0.904	0.30(0.30)	0.99	36851.5	12400.00
16	29039.95	95.52	0.892	0.30(0.30)	0.99	38164.4	11111.00
17	28919.77	97.35	0.885	0.30(0.30)	0.99	38825.8	12211.00
18	28894.01	97.80	0.884	0.30(0.30)	0.99	38989.4	10500.00
19	28684.71	101.59	0.870	0.30(0.30)	0.99	40253.0	12201.00
20	28629.64	102.28	0.867	0.30(0.30)	0.99	40460.9	10710.00
21	28390.84	104.59	0.859	0.30(0.30)	0.99	41068.9	10410.00
22	28307.29	105.83	0.854	0.30(0.30)	0.99	41384.9	12111.00
23	28058.85	108.83	0.844	0.30(0.30)	0.99	42145.5	12231.00
24	28015.33	109.32	0.842	0.30(0.30)	0.99	42265.2	10700.00
25	27802.82	111.78	0.833	0.30(0.30)	0.99	42836.7	12101.10
26	27707.59	112.88	0.829	0.30(0.30)	0.99	43080.1	12261.00
27	27380.37	116.04	0.817	0.30(0.30)	0.99	43699.6	10400.00
28	27046.91	118.67	0.808	0.30(0.30)	0.99	44154.0	10200.00
29	26196.22	125.01	0.792	0.30(0.30)	0.99	45144.8	12010.00
30	26190.77	125.05	0.792	0.30(0.30)	0.99	45148.8	10300.00
31	25363.96	130.07	0.781	0.30(0.30)	0.99	45408.4	10210.00
32	24857.80	133.86	0.773	0.30(0.30)	0.99	45553.5	12000.00
33	22028.48	158.96	0.718	0.30(0.30)	0.99	46168.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2182.69	17.07	2.294	0.30(0.30)	1.00	1008.9	40200.00
2	2467.63	30.02	1.555	0.30(0.30)	1.00	1862.6	40120.00
3	2479.20	31.84	1.518	0.30(0.30)	1.00	1975.9	40100.00
4	2491.96	62.06	1.068	0.30(0.30)	1.00	3340.9	11900.00
5	2488.89	62.22	1.068	0.30(0.30)	1.00	3343.7	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19731.89	17.07	2.294	0.30(0.30)	0.99	5870.7	40200.00
2	21899.53	30.02	1.555	0.30(0.30)	0.99	10412.6	40120.00
3	22495.68	31.84	1.518	0.30(0.30)	0.99	11044.5	40100.00
4	24224.04	39.57	1.365	0.30(0.30)	0.99	13595.4	11831.00
5	24694.85	41.75	1.329	0.30(0.30)	0.99	14347.3	11801.00
6	27272.79	53.20	1.164	0.30(0.30)	0.99	18874.7	11530.00
7	28287.20	60.35	1.078	0.30(0.30)	0.99	22346.4	11000.00
8	28674.29	62.06	1.068	0.30(0.30)	0.99	23411.8	11900.00
9	28706.92	62.22	1.068	0.30(0.30)	0.99	23506.0	11910.00
10	30290.55	69.82	1.025	0.30(0.30)	0.99	27909.7	12500.00
11	30523.12	70.88	1.019	0.30(0.30)	0.99	28580.4	11330.00

12	30921.98	72.78	1.008	0.30(0.30)	0.99	29834.4	11350.00
13	31391.31	76.06	0.990	0.30(0.30)	0.99	32013.7	11300.00
14	31589.73	77.64	0.981	0.30(0.30)	0.99	33007.5	11130.00
15	31523.52	83.67	0.947	0.30(0.30)	0.99	35934.6	12300.00
16	31514.01	85.17	0.939	0.30(0.30)	0.99	36743.5	12330.00
17	31469.13	87.54	0.926	0.30(0.30)	0.99	37996.7	11620.00
18	31448.09	88.00	0.923	0.30(0.30)	0.99	38227.5	12410.00
19	31352.21	89.65	0.914	0.30(0.30)	0.99	39028.7	11600.00
20	31198.94	92.31	0.904	0.30(0.30)	0.99	40195.2	12400.00
21	30960.00	95.52	0.892	0.30(0.30)	0.99	41508.1	11111.00
22	30818.30	97.35	0.885	0.30(0.30)	0.99	42169.5	12211.00
23	30787.25	97.80	0.884	0.30(0.30)	0.99	42333.1	10500.00
24	30533.32	101.59	0.870	0.30(0.30)	0.99	43596.7	12201.00
25	30470.19	102.28	0.867	0.30(0.30)	0.99	43804.6	10710.00
26	30204.21	104.59	0.859	0.30(0.30)	0.99	44412.7	10410.00
27	30106.04	105.83	0.854	0.30(0.30)	0.99	44728.6	12111.00
28	29822.34	108.83	0.844	0.30(0.30)	0.99	45489.2	12231.00
29	29773.02	109.32	0.842	0.30(0.30)	0.99	45608.9	10700.00
30	29531.56	111.78	0.833	0.30(0.30)	0.99	46180.4	12101.10
31	29423.44	112.88	0.829	0.30(0.30)	0.99	46423.8	12261.00
32	29059.00	116.04	0.817	0.30(0.30)	0.99	47043.3	10400.00
33	28694.61	118.67	0.808	0.30(0.30)	0.99	47497.7	10200.00
34	27792.82	125.01	0.792	0.30(0.30)	0.99	48488.5	12010.00
35	27787.11	125.05	0.792	0.30(0.30)	0.99	48492.6	10300.00
36	26924.78	130.07	0.781	0.30(0.30)	0.99	48752.1	10210.00
37	26391.86	133.86	0.773	0.30(0.30)	0.99	48897.2	12000.00
38	23385.06	158.96	0.718	0.30(0.30)	0.99	49511.8	10100.00

TOTAL AREA(ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 31589.73 Tc(MIN.) = 77.644
EFFECTIVE AREA(ACRES) = 33007.49 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49511.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 49511.8 TC(MIN.) = 77.64
EFFECTIVE AREA(ACRES) = 33007.49 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994
PEAK FLOW RATE(CFS) = 31589.73

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19731.89	17.07	2.294	0.30(0.30)	0.99	5870.7	40200.00
2	21899.53	30.02	1.555	0.30(0.30)	0.99	10412.6	40120.00
3	22495.68	31.84	1.518	0.30(0.30)	0.99	11044.5	40100.00
4	24224.04	39.57	1.365	0.30(0.30)	0.99	13595.4	11831.00
5	24694.85	41.75	1.329	0.30(0.30)	0.99	14347.3	11801.00
6	27272.79	53.20	1.164	0.30(0.30)	0.99	18874.7	11530.00
7	28287.20	60.35	1.078	0.30(0.30)	0.99	22346.4	11000.00
8	28674.29	62.06	1.068	0.30(0.30)	0.99	23411.8	11900.00
9	28706.92	62.22	1.068	0.30(0.30)	0.99	23506.0	11910.00
10	30290.55	69.82	1.025	0.30(0.30)	0.99	27909.7	12500.00
11	30523.12	70.88	1.019	0.30(0.30)	0.99	28580.4	11330.00
12	30921.98	72.78	1.008	0.30(0.30)	0.99	29834.4	11350.00
13	31391.31	76.06	0.990	0.30(0.30)	0.99	32013.7	11300.00

14	31589.73	77.64	0.981	0.30(0.30)	0.99	33007.5	11130.00
15	31523.52	83.67	0.947	0.30(0.30)	0.99	35934.6	12300.00
16	31514.01	85.17	0.939	0.30(0.30)	0.99	36743.5	12330.00
17	31469.13	87.54	0.926	0.30(0.30)	0.99	37996.7	11620.00
18	31448.09	88.00	0.923	0.30(0.30)	0.99	38227.5	12410.00
19	31352.21	89.65	0.914	0.30(0.30)	0.99	39028.7	11600.00
20	31198.94	92.31	0.904	0.30(0.30)	0.99	40195.2	12400.00
21	30960.00	95.52	0.892	0.30(0.30)	0.99	41508.1	11111.00
22	30818.30	97.35	0.885	0.30(0.30)	0.99	42169.5	12211.00
23	30787.25	97.80	0.884	0.30(0.30)	0.99	42333.1	10500.00
24	30533.32	101.59	0.870	0.30(0.30)	0.99	43596.7	12201.00
25	30470.19	102.28	0.867	0.30(0.30)	0.99	43804.6	10710.00
26	30204.21	104.59	0.859	0.30(0.30)	0.99	44412.7	10410.00
27	30106.04	105.83	0.854	0.30(0.30)	0.99	44728.6	12111.00
28	29822.34	108.83	0.844	0.30(0.30)	0.99	45489.2	12231.00
29	29773.02	109.32	0.842	0.30(0.30)	0.99	45608.9	10700.00
30	29531.56	111.78	0.833	0.30(0.30)	0.99	46180.4	12101.10
31	29423.44	112.88	0.829	0.30(0.30)	0.99	46423.8	12261.00
32	29059.00	116.04	0.817	0.30(0.30)	0.99	47043.3	10400.00
33	28694.61	118.67	0.808	0.30(0.30)	0.99	47497.7	10200.00
34	27792.82	125.01	0.792	0.30(0.30)	0.99	48488.5	12010.00
35	27787.11	125.05	0.792	0.30(0.30)	0.99	48492.6	10300.00
36	26924.78	130.07	0.781	0.30(0.30)	0.99	48752.1	10210.00
37	26391.86	133.86	0.773	0.30(0.30)	0.99	48897.2	12000.00
38	23385.06	158.96	0.718	0.30(0.30)	0.99	49511.8	10100.00

==========

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S20.DAT
  TIME/DATE OF STUDY: 13:29 04/03/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.601
   2)   10.00;  3.025
   3)   15.00;  2.339
   4)   20.00;  1.950
   5)   25.00;  1.705
   6)   30.00;  1.505
   7)   40.00;  1.303
   8)   50.00;  1.152
   9)   60.00;  1.023
  10)   90.00;  0.852
  11)  120.00;  0.739
  12)  180.00;  0.611
  13)  360.00;  0.442
  14) 1440.00;  0.191
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  12000.00 TO NODE  12001.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   965.01
  ELEVATION DATA: UPSTREAM(FEET) =   4506.20  DOWNSTREAM(FEET) =   4179.61

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.700
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.517
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        9.03      0.30     1.000     0   13.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     18.02
  TOTAL AREA(ACRES) =      9.03   PEAK FLOW RATE(CFS) =     18.02

****************************************************************************
  FLOW PROCESS FROM NODE  12001.00 TO NODE  12002.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4179.61  DOWNSTREAM(FEET) =   3849.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.60   CHANNEL SLOPE =  0.3380
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.273
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.59
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   15.85
  SUBAREA AREA(ACRES) =    18.82       SUBAREA RUNOFF(CFS) =   33.42
  EFFECTIVE AREA(ACRES) =     27.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.8          PEAK FLOW RATE(CFS) =      49.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   8.69
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12002.00 =    1941.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12002.00 TO NODE  12003.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3849.51  DOWNSTREAM(FEET) =   3265.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1892.03   CHANNEL SLOPE =  0.3086
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.85
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.047
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     103.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.86
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   2.90
  Tc(MIN.) =   18.75
  SUBAREA AREA(ACRES) =    68.96       SUBAREA RUNOFF(CFS) =  108.45
  EFFECTIVE AREA(ACRES) =     96.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       96.8         PEAK FLOW RATE(CFS) =     152.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =  12.32
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12003.00 =    3833.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3265.69  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3118.62   CHANNEL SLOPE =  0.2688
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.849
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     381.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.70
  AVERAGE FLOW DEPTH(FEET) =   1.79   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   22.06
  SUBAREA AREA(ACRES) =   328.28       SUBAREA RUNOFF(CFS) =  457.70
  EFFECTIVE AREA(ACRES) =    425.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      425.1         PEAK FLOW RATE(CFS) =     592.67
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.28   FLOW VELOCITY(FEET/SEC.) =  17.87
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.06
  RAINFALL INTENSITY(INCH/HR) =   1.85
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     425.09
  TOTAL STREAM AREA(ACRES) =     425.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     592.67

****************************************************************************
  FLOW PROCESS FROM NODE  12010.00 TO NODE  12011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   264.80
  ELEVATION DATA: UPSTREAM(FEET) =   4208.12  DOWNSTREAM(FEET) =   4068.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.470
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.822
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.06      0.30     1.000     0    7.47
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.53
  TOTAL AREA(ACRES) =      2.06   PEAK FLOW RATE(CFS) =      6.53

****************************************************************************
  FLOW PROCESS FROM NODE  12011.00 TO NODE  12012.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4068.13  DOWNSTREAM(FEET) =   3694.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.45   CHANNEL SLOPE =  0.5703
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.20
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.256
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.98      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.07
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =    9.27
  SUBAREA AREA(ACRES) =     3.98       SUBAREA RUNOFF(CFS) =   10.59
  EFFECTIVE AREA(ACRES) =      6.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      16.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   6.80
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12012.00 =     919.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12012.00 TO NODE  12013.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3694.92  DOWNSTREAM(FEET) =   3415.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   981.94   CHANNEL SLOPE =  0.2845
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.63
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.866
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.64
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   1.89
  Tc(MIN.) =   11.16
  SUBAREA AREA(ACRES) =    35.56       SUBAREA RUNOFF(CFS) =   82.12
  EFFECTIVE AREA(ACRES) =     41.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.6         PEAK FLOW RATE(CFS) =      96.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =  10.29
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12013.00 =    1901.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12013.00 TO NODE  12014.00 IS CODE =  56
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3415.55  DOWNSTREAM(FEET) =   2756.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.68   CHANNEL SLOPE =  0.3420
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.532
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     168.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.19
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   13.59
  SUBAREA AREA(ACRES) =    72.40       SUBAREA RUNOFF(CFS) =  145.43
  EFFECTIVE AREA(ACRES) =    114.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.0         PEAK FLOW RATE(CFS) =     228.99
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =  14.57
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12014.00 =    3827.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2756.62  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1697.28   CHANNEL SLOPE =  0.1940
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.87
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.285
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      121.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     338.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.49
  AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   2.10
  Tc(MIN.) =   15.69
  SUBAREA AREA(ACRES) =   121.96       SUBAREA RUNOFF(CFS) =  217.91
  EFFECTIVE AREA(ACRES) =    235.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      236.0         PEAK FLOW RATE(CFS) =     421.59
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.07   FLOW VELOCITY(FEET/SEC.) =  14.40
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12020.00 =    5525.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.69
  RAINFALL INTENSITY(INCH/HR) =   2.29
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     235.96
  TOTAL STREAM AREA(ACRES) =     235.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     421.59

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      592.67   22.06    1.849  0.30( 0.30) 1.00     425.1   12000.00
      2      421.59   15.69    2.285  0.30( 0.30) 1.00     236.0   12010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      961.86   15.69    2.285  0.30( 0.30) 1.00     538.3   12010.00
      2      921.66   22.06    1.849  0.30( 0.30) 1.00     661.0   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     961.86    Tc(MIN.) =    15.69
  EFFECTIVE AREA(ACRES) =     538.35   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      661.0
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12020.00 TO NODE  12021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2427.28  DOWNSTREAM(FEET) =   2056.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2698.04   CHANNEL SLOPE =  0.1375
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.09
```



```
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.084
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      376.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1264.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.36
  AVERAGE FLOW DEPTH(FEET) =   4.03   TRAVEL TIME(MIN.) =   2.59
  Tc(MIN.) =   18.28
  SUBAREA AREA(ACRES) =   376.13       SUBAREA RUNOFF(CFS) =  603.81
  EFFECTIVE AREA(ACRES) =    914.48     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1037.2          PEAK FLOW RATE(CFS) =    1468.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.35   FLOW VELOCITY(FEET/SEC.) =  18.07
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12021.00 =    9650.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12021.00 TO NODE  12022.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2056.25  DOWNSTREAM(FEET) =   1864.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2552.86   CHANNEL SLOPE =  0.0750
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.50
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.896
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      347.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1717.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.08
  AVERAGE FLOW DEPTH(FEET) =   5.45   TRAVEL TIME(MIN.) =   2.82
  Tc(MIN.) =   21.10
  SUBAREA AREA(ACRES) =   347.45       SUBAREA RUNOFF(CFS) =  499.07
  EFFECTIVE AREA(ACRES) =   1261.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1384.6          PEAK FLOW RATE(CFS) =    1812.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.60   FLOW VELOCITY(FEET/SEC.) =  15.29
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12022.00 =   12203.16 FEET.

****************************************************************************
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```
 FLOW PROCESS FROM NODE  12022.00 TO NODE  12023.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1864.68  DOWNSTREAM(FEET) =   1710.75
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.57   CHANNEL SLOPE =  0.0816
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.76
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.801
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      280.70      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2002.20
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.20
 AVERAGE FLOW DEPTH(FEET) =   5.75   TRAVEL TIME(MIN.) =   1.94
 Tc(MIN.) =   23.05
 SUBAREA AREA(ACRES) =   280.70       SUBAREA RUNOFF(CFS) =  379.16
 EFFECTIVE AREA(ACRES) =   1542.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1665.3         PEAK FLOW RATE(CFS) =    2083.72
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.86

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.86   FLOW VELOCITY(FEET/SEC.) =  16.36
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12023.00 =   14089.73 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1710.75  DOWNSTREAM(FEET) =   1672.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.87   CHANNEL SLOPE =  0.0196
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.49
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.651
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      248.35      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2234.75
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.82
 AVERAGE FLOW DEPTH(FEET) =   8.46   TRAVEL TIME(MIN.) =   3.30
 Tc(MIN.) =   26.35
 SUBAREA AREA(ACRES) =   248.35       SUBAREA RUNOFF(CFS) =  302.01
 EFFECTIVE AREA(ACRES) =   1790.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1913.7         PEAK FLOW RATE(CFS) =    2177.92
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.36

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.36   FLOW VELOCITY(FEET/SEC.) =   9.75
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12024.00 =   16034.60 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1913.7  TC(MIN.) =     26.35
 EFFECTIVE AREA(ACRES) =   1790.98  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =    2177.92

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2177.92   26.35    1.651  0.30( 0.30) 1.00    1791.0   12010.00
     2     1969.81   33.04    1.444  0.30( 0.30) 1.00    1913.7   12000.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:
```

```
--------------------------------------------------------------------------
  FILE NAME: S21.DAT
  TIME/DATE OF STUDY: 13:29 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.601
   2)   10.00;  3.025
   3)   15.00;  2.339
   4)   20.00;  1.950
   5)   25.00;  1.705
   6)   30.00;  1.505
   7)   40.00;  1.303
   8)   50.00;  1.152
   9)   60.00;  1.023
  10)   90.00;  0.852
  11)  120.00;  0.739
  12)  180.00;  0.611
  13)  360.00;  0.442
  14) 1440.00;  0.191
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S20.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1     2177.92   26.35  0.30( 0.30) 1.00    1791.0   12010.00
      2     1969.81   33.04  0.30( 0.30) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =     1913.7

**************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1     2177.92   26.35  0.30( 0.30) 1.00    1791.0   12010.00
      2     1969.81   33.04  0.30( 0.30) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =      1913.7

**************************************************************************
  FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1672.60  DOWNSTREAM(FEET) =   1636.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   780.49   CHANNEL SLOPE =  0.0458
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.95
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.612
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       93.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2232.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.46
  AVERAGE FLOW DEPTH(FEET) =   6.95   TRAVEL TIME(MIN.) =   0.97
  Tc(MIN.) =   27.31
  SUBAREA AREA(ACRES) =    93.19       SUBAREA RUNOFF(CFS) =  110.08
  EFFECTIVE AREA(ACRES) =   1884.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.9         PEAK FLOW RATE(CFS) =    2225.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.94   FLOW VELOCITY(FEET/SEC.) =  13.44
```

```
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.31
  RAINFALL INTENSITY(INCH/HR) =   1.61
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1884.17
  TOTAL STREAM AREA(ACRES) =    2006.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2225.67

****************************************************************************
  FLOW PROCESS FROM NODE  12101.10 TO NODE  12101.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   847.57
  ELEVATION DATA: UPSTREAM(FEET) =   3435.00  DOWNSTREAM(FEET) =   2774.23

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.008
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.887
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        6.56      0.30     1.000     0   11.01
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     15.27
  TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =     15.27

****************************************************************************
  FLOW PROCESS FROM NODE  12101.20 TO NODE  12101.30 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2774.23  DOWNSTREAM(FEET) =   2097.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1205.19   CHANNEL SLOPE =  0.5619
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.48
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.619
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.30
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   1.95
  Tc(MIN.) =   12.96
  SUBAREA AREA(ACRES) =    34.88       SUBAREA RUNOFF(CFS) =   72.81
  EFFECTIVE AREA(ACRES) =     41.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.4          PEAK FLOW RATE(CFS) =      86.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =  12.39
  LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12101.30 =    2052.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2097.09  DOWNSTREAM(FEET) =   1636.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1553.74   CHANNEL SLOPE =  0.2962
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.01
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.327
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     138.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.76
  AVERAGE FLOW DEPTH(FEET) =   0.98   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =   15.16
  SUBAREA AREA(ACRES) =    56.40       SUBAREA RUNOFF(CFS) =  102.87
  EFFECTIVE AREA(ACRES) =     97.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.8          PEAK FLOW RATE(CFS) =     178.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =  12.83
  LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12102.00 =    3606.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =   15.16
 RAINFALL INTENSITY(INCH/HR) =   2.33
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =      97.84
 TOTAL STREAM AREA(ACRES) =      97.84
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     178.45

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2225.67   27.31    1.612  0.30( 0.30) 1.00    1884.2   12010.00
     1     2029.54   34.03    1.424  0.30( 0.30) 1.00    2006.9   12000.00
     2      178.45   15.16    2.327  0.30( 0.30) 1.00      97.8   12101.10

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2085.88   15.16    2.327  0.30( 0.30) 1.00    1143.6   12101.10
     2     2341.24   27.31    1.612  0.30( 0.30) 1.00    1982.0   12010.00
     3     2128.48   34.03    1.424  0.30( 0.30) 1.00    2104.7   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    2341.24    Tc(MIN.) =    27.31
 EFFECTIVE AREA(ACRES) =    1982.01   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     2104.7
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12102.00 TO NODE  12103.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1636.82  DOWNSTREAM(FEET) =   1558.46
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2049.75   CHANNEL SLOPE =  0.0382
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.51
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.506
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      116.59      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2404.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.82
 AVERAGE FLOW DEPTH(FEET) =   7.50   TRAVEL TIME(MIN.) =   2.67
 Tc(MIN.) =   29.98
 SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =  126.53
 EFFECTIVE AREA(ACRES) =   2098.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     2221.3         PEAK FLOW RATE(CFS) =    2341.24
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.41

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.41   FLOW VELOCITY(FEET/SEC.) =  12.73
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12103.00 =   18864.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12103.00 TO NODE  12104.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1558.46  DOWNSTREAM(FEET) =   1453.87
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1971.34   CHANNEL SLOPE =  0.0531
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.13
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.460
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      355.30      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2526.76
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.66
 AVERAGE FLOW DEPTH(FEET) =   7.11   TRAVEL TIME(MIN.) =   2.24
 Tc(MIN.) =   32.22
 SUBAREA AREA(ACRES) =   355.30       SUBAREA RUNOFF(CFS) =  371.00
 EFFECTIVE AREA(ACRES) =   2453.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2576.6         PEAK FLOW RATE(CFS) =    2562.34
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.16

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.16   FLOW VELOCITY(FEET/SEC.) =  14.72
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12104.00 =   20836.18 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12104.00 TO NODE  12105.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1453.87  DOWNSTREAM(FEET) =   1369.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1885.63   CHANNEL SLOPE =  0.0446
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.59
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.415
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      200.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2662.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.94
  AVERAGE FLOW DEPTH(FEET) =   7.59   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =   34.48
  SUBAREA AREA(ACRES) =   200.37       SUBAREA RUNOFF(CFS) =  201.01
  EFFECTIVE AREA(ACRES) =   2654.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2777.0         PEAK FLOW RATE(CFS) =    2662.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.59   FLOW VELOCITY(FEET/SEC.) =  13.94
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12105.00 =   22721.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12105.00 TO NODE  12106.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1369.72  DOWNSTREAM(FEET) =   1298.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1910.12   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.14
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.366
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      339.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2825.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.26
  AVERAGE FLOW DEPTH(FEET) =   8.12   TRAVEL TIME(MIN.) =   2.40
  Tc(MIN.) =   36.88
  SUBAREA AREA(ACRES) =   339.52       SUBAREA RUNOFF(CFS) =  325.78
  EFFECTIVE AREA(ACRES) =   2993.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3116.5         PEAK FLOW RATE(CFS) =    2872.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.18   FLOW VELOCITY(FEET/SEC.) =  13.31
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12106.00 =   24631.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1298.29  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2982.44   CHANNEL SLOPE =  0.0277
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.88
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.287
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      164.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2945.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.98
  AVERAGE FLOW DEPTH(FEET) =   8.87   TRAVEL TIME(MIN.) =   4.15
  Tc(MIN.) =   41.03
  SUBAREA AREA(ACRES) =   164.97       SUBAREA RUNOFF(CFS) =  146.63
  EFFECTIVE AREA(ACRES) =   3158.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3281.5         PEAK FLOW RATE(CFS) =    2872.65
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.77   FLOW VELOCITY(FEET/SEC.) =  11.90
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.03
  RAINFALL INTENSITY(INCH/HR) =   1.29
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3158.76
  TOTAL STREAM AREA(ACRES) =    3281.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2872.65

****************************************************************************
  FLOW PROCESS FROM NODE  12111.00 TO NODE  12112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   939.51
  ELEVATION DATA: UPSTREAM(FEET) =   3108.05  DOWNSTREAM(FEET) =   2753.95

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.265
```

```
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.577
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,BROADLEAF"       -        8.25      0.30     1.000     0   13.27
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     16.91
 TOTAL AREA(ACRES) =      8.25   PEAK FLOW RATE(CFS) =     16.91

****************************************************************************
 FLOW PROCESS FROM NODE  12112.00 TO NODE  12113.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2753.95  DOWNSTREAM(FEET) =   2458.45
 CHANNEL LENGTH THRU SUBAREA(FEET) =   945.14   CHANNEL SLOPE =  0.3127
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.42
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.303
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       16.51      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.82
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.19
 AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =   2.19
 Tc(MIN.) =   15.46
 SUBAREA AREA(ACRES) =    16.51       SUBAREA RUNOFF(CFS) =   29.77
 EFFECTIVE AREA(ACRES) =     24.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       24.8         PEAK FLOW RATE(CFS) =      44.65
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.50

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   8.14
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12113.00 =    1884.65 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12113.00 TO NODE  12114.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2458.45  DOWNSTREAM(FEET) =   1823.37
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.76   CHANNEL SLOPE =  0.3336
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.77
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.071
 SUBAREA LOSS RATE DATA(AMC  II):
```



```
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       57.98      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      90.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.63
 AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   2.98
 Tc(MIN.) =   18.44
 SUBAREA AREA(ACRES) =    57.98       SUBAREA RUNOFF(CFS) =   92.43
 EFFECTIVE AREA(ACRES) =     82.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       82.7         PEAK FLOW RATE(CFS) =     131.91
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =  12.02
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12114.00 =    3788.41 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12114.00 TO NODE  12115.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1823.37  DOWNSTREAM(FEET) =   1500.53
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.04   CHANNEL SLOPE =  0.1916
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.910
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -      124.07      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     221.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.82
 AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   2.38
 Tc(MIN.) =   20.82
 SUBAREA AREA(ACRES) =   124.07       SUBAREA RUNOFF(CFS) =  179.78
 EFFECTIVE AREA(ACRES) =    206.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      206.8         PEAK FLOW RATE(CFS) =     299.67
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.72

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.72   FLOW VELOCITY(FEET/SEC.) =  12.95
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12115.00 =    5473.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =  56
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1500.53  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.45   CHANNEL SLOPE =  0.1519
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.98
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.787
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     341.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.43
  AVERAGE FLOW DEPTH(FEET) =   1.97   TRAVEL TIME(MIN.) =   2.52
  Tc(MIN.) =   23.33
  SUBAREA AREA(ACRES) =    62.55       SUBAREA RUNOFF(CFS) =   83.70
  EFFECTIVE AREA(ACRES) =    269.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      269.4         PEAK FLOW RATE(CFS) =     360.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.03   FLOW VELOCITY(FEET/SEC.) =  12.61
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12121.00 =    7348.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.33
  RAINFALL INTENSITY(INCH/HR) =   1.79
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     269.36
  TOTAL STREAM AREA(ACRES) =     269.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     360.43

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2736.22   29.08    1.542  0.30( 0.30) 1.00    2320.4   12101.10
      1     2872.65   41.03    1.287  0.30( 0.30) 1.00    3158.8   12010.00
      1     2652.04   48.05    1.181  0.30( 0.30) 1.00    3281.5   12000.00
      2      360.43   23.33    1.787  0.30( 0.30) 1.00     269.4   12111.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2988.78   23.33    1.787  0.30( 0.30) 1.00    2130.8   12111.00
      2     3037.23   29.08    1.542  0.30( 0.30) 1.00    2589.7   12101.10
      3     3112.05   41.03    1.287  0.30( 0.30) 1.00    3428.1   12010.00
      4     2865.75   48.05    1.181  0.30( 0.30) 1.00    3550.8   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    3112.05    Tc(MIN.) =    41.03
  EFFECTIVE AREA(ACRES) =    3428.12   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3550.8
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12121.00 TO NODE  12241.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1215.72  DOWNSTREAM(FEET) =   1122.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3397.13   CHANNEL SLOPE =  0.0275
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.19
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.217
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      136.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3168.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.17
  AVERAGE FLOW DEPTH(FEET) =   9.18   TRAVEL TIME(MIN.) =   4.65
  Tc(MIN.) =   45.68
  SUBAREA AREA(ACRES) =   136.41       SUBAREA RUNOFF(CFS) =  112.61
  EFFECTIVE AREA(ACRES) =   3564.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3687.2         PEAK FLOW RATE(CFS) =    3112.05
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.11   FLOW VELOCITY(FEET/SEC.) =  12.11
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3687.2  TC(MIN.) =     45.68
  EFFECTIVE AREA(ACRES) =   3564.53  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    3112.05

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2988.78	28.02	1.584	0.30(0.30)	1.00	2267.2	12111.00
2	3037.23	33.76	1.429	0.30(0.30)	1.00	2726.1	12101.10
3	3112.05	45.68	1.217	0.30(0.30)	1.00	3564.5	12010.00
4	2865.75	52.80	1.116	0.30(0.30)	1.00	3687.2	12000.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S22.DAT
  TIME/DATE OF STUDY: 13:29 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.601
   2)   10.00;  3.025
   3)   15.00;  2.339
   4)   20.00;  1.950
   5)   25.00;  1.705
   6)   30.00;  1.505
   7)   40.00;  1.303
   8)   50.00;  1.152
   9)   60.00;  1.023
  10)   90.00;  0.852
  11)  120.00;  0.739
  12)  180.00;  0.611
  13)  360.00;  0.442
  14) 1440.00;  0.191
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12201.00 TO NODE  12202.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   926.94
  ELEVATION DATA: UPSTREAM(FEET) =   3077.00  DOWNSTREAM(FEET) =   2740.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.295
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.573
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.74      0.30     1.000     0   13.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.74
  TOTAL AREA(ACRES) =      5.74   PEAK FLOW RATE(CFS) =     11.74

**************************************************************************
  FLOW PROCESS FROM NODE  12202.00 TO NODE  12203.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2740.64  DOWNSTREAM(FEET) =   2551.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   832.53   CHANNEL SLOPE =  0.2271
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.300
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.27
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   2.21
  Tc(MIN.) =   15.51
  SUBAREA AREA(ACRES) =    18.85       SUBAREA RUNOFF(CFS) =   33.92
  EFFECTIVE AREA(ACRES) =     24.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.6          PEAK FLOW RATE(CFS) =      44.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   7.30
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12203.00 =    1759.47 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12203.00 TO NODE  12204.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2551.60  DOWNSTREAM(FEET) =   2151.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.86   CHANNEL SLOPE =  0.1944
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.02
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.019
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     109.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.50
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =   19.12
  SUBAREA AREA(ACRES) =    83.93       SUBAREA RUNOFF(CFS) =  129.83
  EFFECTIVE AREA(ACRES) =    108.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      108.5         PEAK FLOW RATE(CFS) =     167.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.24   FLOW VELOCITY(FEET/SEC.) =  10.86
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12204.00 =    3816.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12204.00 TO NODE  12205.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2151.76  DOWNSTREAM(FEET) =   1788.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2363.99   CHANNEL SLOPE =  0.1538
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.832
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      182.26      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     293.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.95
  AVERAGE FLOW DEPTH(FEET) =   1.81   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   22.41
  SUBAREA AREA(ACRES) =   182.26       SUBAREA RUNOFF(CFS) =  251.26
  EFFECTIVE AREA(ACRES) =    290.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      290.8         PEAK FLOW RATE(CFS) =     400.87
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.15   FLOW VELOCITY(FEET/SEC.) =  13.06
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12205.00 =    6180.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12205.00 TO NODE  12206.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1788.16  DOWNSTREAM(FEET) =   1385.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2825.33   CHANNEL SLOPE =  0.1424
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.48
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.669
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      153.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     495.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.54
  AVERAGE FLOW DEPTH(FEET) =   2.45   TRAVEL TIME(MIN.) =   3.48
  Tc(MIN.) =   25.89
  SUBAREA AREA(ACRES) =   153.05       SUBAREA RUNOFF(CFS) =  188.63
  EFFECTIVE AREA(ACRES) =    443.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      443.8         PEAK FLOW RATE(CFS) =     546.99
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.59   FLOW VELOCITY(FEET/SEC.) =  13.92
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12206.00 =    9005.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1385.78  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3579.23   CHANNEL SLOPE =  0.1061
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.495
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.52      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     618.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.96
  AVERAGE FLOW DEPTH(FEET) =   2.99   TRAVEL TIME(MIN.) =   4.60
  Tc(MIN.) =   30.49
  SUBAREA AREA(ACRES) =   132.52       SUBAREA RUNOFF(CFS) =  142.54
  EFFECTIVE AREA(ACRES) =    576.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      576.4          PEAK FLOW RATE(CFS) =     619.92
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.99   FLOW VELOCITY(FEET/SEC.) =  12.99
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.49
  RAINFALL INTENSITY(INCH/HR) =   1.50
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     576.35
  TOTAL STREAM AREA(ACRES) =     576.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     619.92

****************************************************************************
  FLOW PROCESS FROM NODE  12211.00 TO NODE  12212.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   733.41
  ELEVATION DATA: UPSTREAM(FEET) =   1669.93  DOWNSTREAM(FEET) =   1536.26

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.893
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.491
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        8.90      0.30     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     17.55
  TOTAL AREA(ACRES) =      8.90   PEAK FLOW RATE(CFS) =     17.55

****************************************************************************
  FLOW PROCESS FROM NODE  12212.00 TO NODE  12213.00 IS CODE =  56
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1536.26  DOWNSTREAM(FEET) =   1416.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1253.05   CHANNEL SLOPE =  0.0960
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.096
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.94
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   4.23
  Tc(MIN.) =   18.13
  SUBAREA AREA(ACRES) =    17.91       SUBAREA RUNOFF(CFS) =   28.95
  EFFECTIVE AREA(ACRES) =     26.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       26.8         PEAK FLOW RATE(CFS) =      43.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   5.46
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12213.00 =    1986.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12213.00 TO NODE  12214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1416.02  DOWNSTREAM(FEET) =   1234.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1877.62   CHANNEL SLOPE =  0.0966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.39
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.848
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     130.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.92
  AVERAGE FLOW DEPTH(FEET) =   1.31   TRAVEL TIME(MIN.) =   3.95
  Tc(MIN.) =   22.08
  SUBAREA AREA(ACRES) =   125.19       SUBAREA RUNOFF(CFS) =  174.46
  EFFECTIVE AREA(ACRES) =    152.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      152.0          PEAK FLOW RATE(CFS) =     211.82
```

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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =   9.20
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12214.00 =    3864.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1234.66  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2510.91   CHANNEL SLOPE =  0.0910
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.62
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.670
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.35      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     421.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.02
  AVERAGE FLOW DEPTH(FEET) =   2.54   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   25.87
  SUBAREA AREA(ACRES) =   339.35       SUBAREA RUNOFF(CFS) =  418.45
  EFFECTIVE AREA(ACRES) =    491.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      491.4         PEAK FLOW RATE(CFS) =     605.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.07   FLOW VELOCITY(FEET/SEC.) =  12.22
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12221.00 =    6374.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.87
  RAINFALL INTENSITY(INCH/HR) =   1.67
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     491.35
  TOTAL STREAM AREA(ACRES) =     491.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     605.88
```



```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      619.92   30.49    1.495  0.30( 0.30) 1.00     576.4   12201.00
      2      605.88   25.87    1.670  0.30( 0.30) 1.00     491.4   12211.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1208.91   25.87    1.670  0.30( 0.30) 1.00     980.4   12211.00
      2     1148.41   30.49    1.495  0.30( 0.30) 1.00    1067.7   12201.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1208.91    Tc(MIN.) =    25.87
  EFFECTIVE AREA(ACRES) =     980.39   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1067.7
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1006.12  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.84   CHANNEL SLOPE =  0.0459
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.34
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.535
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.60      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1279.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.65
  AVERAGE FLOW DEPTH(FEET) =   5.32   TRAVEL TIME(MIN.) =   3.38
  Tc(MIN.) =   29.26
  SUBAREA AREA(ACRES) =   127.60       SUBAREA RUNOFF(CFS) =  141.81
  EFFECTIVE AREA(ACRES) =   1107.99     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1195.3         PEAK FLOW RATE(CFS) =    1231.39
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.22   FLOW VELOCITY(FEET/SEC.) =  11.53
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

****************************************************************************
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```
 FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12231.00 TO NODE  12231.50 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   553.71
 ELEVATION DATA: UPSTREAM(FEET) =   2687.04  DOWNSTREAM(FEET) =   2470.68

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.660
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.935
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        3.48      0.30     1.000     0   10.66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      8.25
 TOTAL AREA(ACRES) =      3.48   PEAK FLOW RATE(CFS) =      8.25

****************************************************************************
 FLOW PROCESS FROM NODE  12231.50 TO NODE  12232.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2470.68  DOWNSTREAM(FEET) =   2375.54
 CHANNEL LENGTH THRU SUBAREA(FEET) =   410.38   CHANNEL SLOPE =  0.2318
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.770
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       12.43      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.08
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.70
 AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   1.20
 Tc(MIN.) =   11.86
 SUBAREA AREA(ACRES) =    12.43       SUBAREA RUNOFF(CFS) =   27.63
 EFFECTIVE AREA(ACRES) =     15.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       15.9         PEAK FLOW RATE(CFS) =      35.37
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.48

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  0.48   FLOW VELOCITY(FEET/SEC.) =   6.79
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12232.00 =     964.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12232.00 TO NODE  12233.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2375.54  DOWNSTREAM(FEET) =   2252.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =   939.16   CHANNEL SLOPE =  0.1305
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.73
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.439
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       17.65      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.39
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.50
 AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   2.41
 Tc(MIN.) =   14.27
 SUBAREA AREA(ACRES) =    17.65       SUBAREA RUNOFF(CFS) =   33.98
 EFFECTIVE AREA(ACRES) =     33.56     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       33.6         PEAK FLOW RATE(CFS) =      64.61
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   6.92
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12233.00 =    1903.25 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12233.00 TO NODE  12234.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2252.99  DOWNSTREAM(FEET) =   2163.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =   976.53   CHANNEL SLOPE =  0.0921
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.207
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       19.54      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.39
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.69
 AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   2.43
```

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  Tc(MIN.) =   16.70
  SUBAREA AREA(ACRES) =    19.54       SUBAREA RUNOFF(CFS) =   33.53
  EFFECTIVE AREA(ACRES) =     53.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       53.1         PEAK FLOW RATE(CFS) =      91.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   6.93
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12234.00 =    2879.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12234.00 TO NODE  12235.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2163.07  DOWNSTREAM(FEET) =   2018.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.65   CHANNEL SLOPE =  0.0759
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.896
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     127.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.24
  AVERAGE FLOW DEPTH(FEET) =   1.38   TRAVEL TIME(MIN.) =   4.40
  Tc(MIN.) =   21.10
  SUBAREA AREA(ACRES) =    51.14       SUBAREA RUNOFF(CFS) =   73.47
  EFFECTIVE AREA(ACRES) =    104.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =     149.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =   7.60
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12235.00 =    4789.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12235.00 TO NODE  12236.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2018.08  DOWNSTREAM(FEET) =   1607.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.94   CHANNEL SLOPE =  0.2162
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26
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  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.762
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     180.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.54
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   2.74
  Tc(MIN.) =   23.84
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   62.42
  EFFECTIVE AREA(ACRES) =    151.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =     199.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =  11.91
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12236.00 =    6686.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12236.00 TO NODE  12237.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1607.89  DOWNSTREAM(FEET) =   1326.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2213.20   CHANNEL SLOPE =  0.1273
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.613
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     251.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.67
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   27.30
  SUBAREA AREA(ACRES) =    87.00       SUBAREA RUNOFF(CFS) =  102.83
  EFFECTIVE AREA(ACRES) =    238.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      238.7         PEAK FLOW RATE(CFS) =     282.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.86   FLOW VELOCITY(FEET/SEC.) =  11.02
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12237.00 =    8899.57 FEET.

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 FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1326.23  DOWNSTREAM(FEET) =   1122.29
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2236.51   CHANNEL SLOPE =  0.0912
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.486
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       81.83      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     325.79
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.24
 AVERAGE FLOW DEPTH(FEET) =   2.21   TRAVEL TIME(MIN.) =   3.64
 Tc(MIN.) =   30.94
 SUBAREA AREA(ACRES) =    81.83       SUBAREA RUNOFF(CFS) =   87.36
 EFFECTIVE AREA(ACRES) =    320.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      320.5         PEAK FLOW RATE(CFS) =     342.15
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.27

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.27   FLOW VELOCITY(FEET/SEC.) =  10.37
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S21.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     2988.78   28.02  0.30( 0.30) 1.00    2267.2   12111.00
     2     3037.23   33.76  0.30( 0.30) 1.00    2726.1   12101.10
     3     3112.05   45.68  0.30( 0.30) 1.00    3564.5   12010.00
     4     2865.75   52.80  0.30( 0.30) 1.00    3687.2   12000.00
   TOTAL AREA(ACRES) =     3687.2

****************************************************************************
 FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
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 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     2988.78   28.02  0.30( 0.30) 1.00    2267.2   12111.00
     2     3037.23   33.76  0.30( 0.30) 1.00    2726.1   12101.10
     3     3112.05   45.68  0.30( 0.30) 1.00    3564.5   12010.00
     4     2865.75   52.80  0.30( 0.30) 1.00    3687.2   12000.00
   TOTAL AREA(ACRES) =     3687.2

****************************************************************************
 FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2988.78   28.02    1.584  0.30( 0.30) 1.00    2267.2   12111.00
     2     3037.23   33.76    1.429  0.30( 0.30) 1.00    2726.1   12101.10
     3     3112.05   45.68    1.217  0.30( 0.30) 1.00    3564.5   12010.00
     4     2865.75   52.80    1.116  0.30( 0.30) 1.00    3687.2   12000.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      342.15   30.94    1.486  0.30( 0.30) 1.00     320.5   12231.00
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3324.31   28.02    1.584  0.30( 0.30) 1.00    2557.5   12111.00
     2     3355.54   30.94    1.486  0.30( 0.30) 1.00    2820.9   12231.00
     3     3362.94   33.76    1.429  0.30( 0.30) 1.00    3046.6   12101.10
     4     3376.66   45.68    1.217  0.30( 0.30) 1.00    3885.0   12010.00
     5     3101.12   52.80    1.116  0.30( 0.30) 1.00    4007.7   12000.00
   TOTAL AREA(ACRES) =     4007.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     3376.66  Tc(MIN.) =   45.681
 EFFECTIVE AREA(ACRES) =   3885.04  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4007.7
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12241.00 TO NODE  12242.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1122.29  DOWNSTREAM(FEET) =   1062.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.03   CHANNEL SLOPE =  0.0291
 GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.82
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.176
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      219.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3463.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.47
  AVERAGE FLOW DEPTH(FEET) =   7.80   TRAVEL TIME(MIN.) =   2.74
  Tc(MIN.) =   48.43
  SUBAREA AREA(ACRES) =   219.09       SUBAREA RUNOFF(CFS) =  172.70
  EFFECTIVE AREA(ACRES) =   4104.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4226.8         PEAK FLOW RATE(CFS) =    3376.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.70   FLOW VELOCITY(FEET/SEC.) =  12.38
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12242.00 =   33064.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12242.00 TO NODE  12243.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1062.50  DOWNSTREAM(FEET) =    998.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.30   CHANNEL SLOPE =  0.0331
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.57
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.141
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      249.96      0.30     0.995     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3471.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.07
  AVERAGE FLOW DEPTH(FEET) =   7.56   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   50.89
  SUBAREA AREA(ACRES) =   249.96       SUBAREA RUNOFF(CFS) =  189.44
  EFFECTIVE AREA(ACRES) =   4354.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4476.8         PEAK FLOW RATE(CFS) =    3376.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) =  7.46   FLOW VELOCITY(FEET/SEC.) =  12.97
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12243.00 =   34995.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12243.00 TO NODE  12244.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    998.53  DOWNSTREAM(FEET) =    926.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1863.28   CHANNEL SLOPE =  0.0389
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.23
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.112
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      166.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3437.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.82
  AVERAGE FLOW DEPTH(FEET) =   7.22   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =   53.14
  SUBAREA AREA(ACRES) =   166.97       SUBAREA RUNOFF(CFS) =  121.96
  EFFECTIVE AREA(ACRES) =   4521.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4643.8         PEAK FLOW RATE(CFS) =    3376.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.15   FLOW VELOCITY(FEET/SEC.) =  13.76
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12244.00 =   36859.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12244.00 TO NODE  12251.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    926.00  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1665.37   CHANNEL SLOPE =  0.0170
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.076
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3405.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.19
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  AVERAGE FLOW DEPTH(FEET) =   8.86   TRAVEL TIME(MIN.) =   2.72
  Tc(MIN.) =   55.86
  SUBAREA AREA(ACRES) =    83.41       SUBAREA RUNOFF(CFS) =   58.29
  EFFECTIVE AREA(ACRES) =   4604.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4727.2         PEAK FLOW RATE(CFS) =    3376.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.82   FLOW VELOCITY(FEET/SEC.) =  10.17
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3324.31   38.23    1.339  0.30( 0.30) 1.00    3277.0   12111.00
      2     3355.54   41.12    1.286  0.30( 0.30) 1.00    3540.3   12231.00
      3     3362.94   43.94    1.244  0.30( 0.30) 1.00    3766.1   12101.10
      4     3376.66   55.86    1.076  0.30( 0.30) 1.00    4604.5   12010.00
      5     3101.12   63.22    1.005  0.30( 0.30) 1.00    4727.2   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1231.39   29.26    1.535  0.30( 0.30) 1.00    1108.0   12211.00
      2     1211.14   33.92    1.426  0.30( 0.30) 1.00    1195.3   12201.00
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4255.37   29.26    1.535  0.30( 0.30) 1.00    3615.9   12211.00
      2     4408.00   33.92    1.426  0.30( 0.30) 1.00    4103.3   12201.00
      3     4441.91   38.23    1.339  0.30( 0.30) 1.00    4472.3   12111.00
      4     4416.43   41.12    1.286  0.30( 0.30) 1.00    4735.6   12231.00
      5     4378.00   43.94    1.244  0.30( 0.30) 1.00    4961.4   12101.10
      6     4211.96   55.86    1.076  0.30( 0.30) 1.00    5799.8   12010.00
      7     3859.26   63.22    1.005  0.30( 0.30) 1.00    5922.5   12000.00
    TOTAL AREA(ACRES) =      5922.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4441.91  Tc(MIN.) =   38.227
  EFFECTIVE AREA(ACRES) =   4472.28  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5922.5
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    897.69  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2133.08   CHANNEL SLOPE =  0.0238
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.34
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.287
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       85.79      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4480.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.41
  AVERAGE FLOW DEPTH(FEET) =   9.34   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =   41.09
  SUBAREA AREA(ACRES) =    85.79       SUBAREA RUNOFF(CFS) =   76.18
  EFFECTIVE AREA(ACRES) =   4558.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6008.3         PEAK FLOW RATE(CFS) =    4441.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.30   FLOW VELOCITY(FEET/SEC.) =  12.38
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12281.00 =   40657.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.09
  RAINFALL INTENSITY(INCH/HR) =   1.29
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    4558.07
  TOTAL STREAM AREA(ACRES) =    6008.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    4441.91

****************************************************************************
  FLOW PROCESS FROM NODE  12261.00 TO NODE  12261.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   378.71
  ELEVATION DATA: UPSTREAM(FEET) =   2264.27  DOWNSTREAM(FEET) =   2072.51
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.694
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.437
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.96      0.30     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.36
  TOTAL AREA(ACRES) =      2.96   PEAK FLOW RATE(CFS) =      8.36

****************************************************************************
  FLOW PROCESS FROM NODE  12261.50 TO NODE  12262.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2072.51  DOWNSTREAM(FEET) =   1875.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   609.41   CHANNEL SLOPE =  0.3233
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.17
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   1.65
  Tc(MIN.) =   10.34
  SUBAREA AREA(ACRES) =     9.89       SUBAREA RUNOFF(CFS) =   23.84
  EFFECTIVE AREA(ACRES) =     12.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.9         PEAK FLOW RATE(CFS) =      30.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   7.18
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12262.00 =     988.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12262.00 TO NODE  12263.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1875.51  DOWNSTREAM(FEET) =   1686.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.89   CHANNEL SLOPE =  0.1957
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.683
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.49
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   12.49
  SUBAREA AREA(ACRES) =    22.00       SUBAREA RUNOFF(CFS) =   47.18
  EFFECTIVE AREA(ACRES) =     34.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.8         PEAK FLOW RATE(CFS) =      74.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   8.35
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12263.00 =    1956.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12263.00 TO NODE  12264.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1686.10  DOWNSTREAM(FEET) =   1572.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.28   CHANNEL SLOPE =  0.1198
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.414
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     108.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.03
  AVERAGE FLOW DEPTH(FEET) =   1.11   TRAVEL TIME(MIN.) =   1.96
  Tc(MIN.) =   14.46
  SUBAREA AREA(ACRES) =    35.72       SUBAREA RUNOFF(CFS) =   67.95
  EFFECTIVE AREA(ACRES) =     70.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =     134.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) =   8.61
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12264.00 =    2900.29 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12264.00 TO NODE  12265.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1572.93  DOWNSTREAM(FEET) =   1506.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =   569.03   CHANNEL SLOPE =  0.1169
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.46
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.301
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.21      0.30     0.886     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.886
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     173.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.22
  AVERAGE FLOW DEPTH(FEET) =   1.46   TRAVEL TIME(MIN.) =   1.03
  Tc(MIN.) =   15.48
  SUBAREA AREA(ACRES) =    43.21       SUBAREA RUNOFF(CFS) =   79.16
  EFFECTIVE AREA(ACRES) =    113.78     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      113.8         PEAK FLOW RATE(CFS) =     206.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =   9.73
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12265.00 =    3469.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12265.00 TO NODE  12266.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.41  DOWNSTREAM(FEET) =   1311.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2121.93   CHANNEL SLOPE =  0.0920
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.04
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.020
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.55      0.30     0.710     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.710
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     275.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.77
  AVERAGE FLOW DEPTH(FEET) =   2.01   TRAVEL TIME(MIN.) =   3.62
  Tc(MIN.) =   19.11
  SUBAREA AREA(ACRES) =    84.55       SUBAREA RUNOFF(CFS) =  137.47
  EFFECTIVE AREA(ACRES) =    198.33     AREA-AVERAGED Fm(INCH/HR) =   0.26
```



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  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.85
  TOTAL AREA(ACRES) =      198.3         PEAK FLOW RATE(CFS) =     314.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.16   FLOW VELOCITY(FEET/SEC.) =  10.17
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12266.00 =    5591.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12266.00 TO NODE  12267.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1311.17  DOWNSTREAM(FEET) =   1232.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1555.18   CHANNEL SLOPE =  0.0506
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.04
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.853
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      160.37      0.30     0.633     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.633
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     434.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.02
  AVERAGE FLOW DEPTH(FEET) =   3.01   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   21.98
  SUBAREA AREA(ACRES) =   160.37       SUBAREA RUNOFF(CFS) =  240.04
  EFFECTIVE AREA(ACRES) =    358.70     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.75
  TOTAL AREA(ACRES) =      358.7         PEAK FLOW RATE(CFS) =     525.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.32   FLOW VELOCITY(FEET/SEC.) =   9.49
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12267.00 =    7146.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12267.00 TO NODE  12268.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1232.47  DOWNSTREAM(FEET) =   1141.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2111.19   CHANNEL SLOPE =  0.0430
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.673
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      100.65      0.30     0.970     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.970
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     587.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.23
  AVERAGE FLOW DEPTH(FEET) =   3.67   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   25.79
  SUBAREA AREA(ACRES) =   100.65       SUBAREA RUNOFF(CFS) =  125.22
  EFFECTIVE AREA(ACRES) =    459.35     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      459.4         PEAK FLOW RATE(CFS) =     592.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.69   FLOW VELOCITY(FEET/SEC.) =   9.24
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12268.00 =    9257.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12268.00 TO NODE  12269.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1141.79  DOWNSTREAM(FEET) =   1115.83
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1295.17   CHANNEL SLOPE =  0.0200
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.553
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      103.26      0.30     0.838     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.838
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     652.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.19
  AVERAGE FLOW DEPTH(FEET) =   4.69   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =   28.80
  SUBAREA AREA(ACRES) =   103.26       SUBAREA RUNOFF(CFS) =  120.98
  EFFECTIVE AREA(ACRES) =    562.61     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      562.6         PEAK FLOW RATE(CFS) =     663.70
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.73   FLOW VELOCITY(FEET/SEC.) =   7.22
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.00 =   10552.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.00 TO NODE  12269.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1115.83  DOWNSTREAM(FEET) =   1100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1137.63   CHANNEL SLOPE =  0.0139
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.28
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.469
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.20      0.30     0.708     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.708
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     692.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.38
  AVERAGE FLOW DEPTH(FEET) =   5.28   TRAVEL TIME(MIN.) =   2.97
  Tc(MIN.) =   31.77
  SUBAREA AREA(ACRES) =    50.20       SUBAREA RUNOFF(CFS) =   56.79
  EFFECTIVE AREA(ACRES) =    612.81     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      612.8         PEAK FLOW RATE(CFS) =     678.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.22   FLOW VELOCITY(FEET/SEC.) =   6.35
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.50 =   11690.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.50 TO NODE  12270.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1091.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1219.38   CHANNEL SLOPE =  0.0073
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.389
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.30      0.30     0.583     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.583
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     731.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.11
  AVERAGE FLOW DEPTH(FEET) =   6.32   TRAVEL TIME(MIN.) =   3.98
  Tc(MIN.) =   35.74
  SUBAREA AREA(ACRES) =    98.30       SUBAREA RUNOFF(CFS) =  107.41
  EFFECTIVE AREA(ACRES) =    711.11     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      711.1         PEAK FLOW RATE(CFS) =     741.17
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.36   FLOW VELOCITY(FEET/SEC.) =   5.13
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12270.00 =   12909.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12270.00 TO NODE  12271.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1091.06  DOWNSTREAM(FEET) =    962.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1995.19   CHANNEL SLOPE =  0.0646
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.96
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.332
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.93      0.30     0.746     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.746
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     831.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.77
  AVERAGE FLOW DEPTH(FEET) =   3.95   TRAVEL TIME(MIN.) =   2.83
  Tc(MIN.) =   38.57
  SUBAREA AREA(ACRES) =   181.93       SUBAREA RUNOFF(CFS) =  181.44
  EFFECTIVE AREA(ACRES) =    893.04     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.76
  TOTAL AREA(ACRES) =      893.0         PEAK FLOW RATE(CFS) =     886.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.08   FLOW VELOCITY(FEET/SEC.) =  11.96
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12271.00 =   14904.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12271.00 TO NODE  12272.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    962.23  DOWNSTREAM(FEET) =    917.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1613.85   CHANNEL SLOPE =  0.0278
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.279
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.79      0.30     0.910     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     968.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.99
  AVERAGE FLOW DEPTH(FEET) =   5.25   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   41.56
  SUBAREA AREA(ACRES) =   181.79       SUBAREA RUNOFF(CFS) =  164.67
  EFFECTIVE AREA(ACRES) =   1074.83     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.79
  TOTAL AREA(ACRES) =     1074.8         PEAK FLOW RATE(CFS) =    1008.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.36   FLOW VELOCITY(FEET/SEC.) =   9.08
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12272.00 =   16518.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    917.38  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3182.34   CHANNEL SLOPE =  0.0221
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.76
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.184
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.99      0.30     0.948     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.948
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1041.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.43
  AVERAGE FLOW DEPTH(FEET) =   5.75   TRAVEL TIME(MIN.) =   6.29
  Tc(MIN.) =   47.86
  SUBAREA AREA(ACRES) =    79.99       SUBAREA RUNOFF(CFS) =   64.79
  EFFECTIVE AREA(ACRES) =   1154.82     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     1154.8         PEAK FLOW RATE(CFS) =    1008.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.66   FLOW VELOCITY(FEET/SEC.) =   8.36
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12281.00 =   19701.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 47.86
RAINFALL INTENSITY(INCH/HR) = 1.18
AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.80
EFFECTIVE STREAM AREA(ACRES) = 1154.82
TOTAL STREAM AREA(ACRES) = 1154.82
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1008.59

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4255.37	32.15	1.462	0.30(0.30)	1.00	3701.7	12211.00
1	4408.00	36.79	1.368	0.30(0.30)	1.00	4189.1	12201.00
1	4441.91	41.09	1.287	0.30(0.30)	1.00	4558.1	12111.00
1	4416.43	43.99	1.243	0.30(0.30)	1.00	4821.4	12231.00
1	4378.00	46.82	1.200	0.30(0.30)	1.00	5047.2	12101.10
1	4211.96	58.77	1.039	0.30(0.30)	1.00	5885.6	12010.00
1	3859.26	66.19	0.988	0.30(0.30)	1.00	6008.3	12000.00
2	1008.59	47.86	1.184	0.30(0.24)	0.80	1154.8	12261.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5131.89	32.15	1.462	0.30(0.29)	0.97	4477.6	12211.00
2	5334.05	36.79	1.368	0.30(0.29)	0.96	5076.9	12201.00
3	5401.62	41.09	1.287	0.30(0.29)	0.96	5549.7	12111.00
4	5400.86	43.99	1.243	0.30(0.29)	0.96	5882.9	12231.00
5	5381.09	46.82	1.200	0.30(0.29)	0.96	6176.9	12101.10
6	5372.16	47.86	1.184	0.30(0.29)	0.96	6274.9	12261.00
7	5065.15	58.77	1.039	0.30(0.29)	0.97	7040.4	12010.00
8	4657.78	66.19	0.988	0.30(0.29)	0.97	7163.1	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5401.62 Tc(MIN.) = 41.09
EFFECTIVE AREA(ACRES) = 5549.66 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7163.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

****
FLOW PROCESS FROM NODE 12281.00 TO NODE 12282.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 846.91 DOWNSTREAM(FEET) = 835.60
CHANNEL LENGTH THRU SUBAREA(FEET) = 1561.00 CHANNEL SLOPE = 0.0072
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.77
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.240
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	267.56	0.30	0.867	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5519.61
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.44
AVERAGE FLOW DEPTH(FEET) = 13.76 TRAVEL TIME(MIN.) = 3.08
Tc(MIN.) = 44.17
SUBAREA AREA(ACRES) = 267.56 SUBAREA RUNOFF(CFS) = 235.97
EFFECTIVE AREA(ACRES) = 5817.22 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7430.6 PEAK FLOW RATE(CFS) = 5401.62
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 13.62 FLOW VELOCITY(FEET/SEC.) = 8.40
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12282.00 = 42218.56 FEET.
==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 7430.6 TC(MIN.) = 44.17
EFFECTIVE AREA(ACRES) = 5817.22 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.960
PEAK FLOW RATE(CFS) = 5401.62

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5131.89	35.27	1.399	0.30(0.29)	0.96	4745.1	12211.00
2	5334.05	39.88	1.305	0.30(0.29)	0.96	5344.5	12201.00
3	5401.62	44.17	1.240	0.30(0.29)	0.96	5817.2	12111.00
4	5400.86	47.07	1.196	0.30(0.29)	0.96	6150.5	12231.00
5	5381.09	49.90	1.153	0.30(0.29)	0.96	6444.5	12101.10
6	5372.16	50.94	1.140	0.30(0.29)	0.96	6542.4	12261.00
7	5065.15	61.91	1.012	0.30(0.29)	0.96	7307.9	12010.00
8	4657.78	69.40	0.969	0.30(0.29)	0.96	7430.6	12000.00

==========
==========
END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S23.DAT
  TIME/DATE OF STUDY: 13:29 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.601
   2)   10.00;  3.025
   3)   15.00;  2.339
   4)   20.00;  1.950
   5)   25.00;  1.705
   6)   30.00;  1.505
   7)   40.00;  1.303
   8)   50.00;  1.152
   9)   60.00;  1.023
  10)   90.00;  0.852
  11)  120.00;  0.739
  12)  180.00;  0.611
  13)  360.00;  0.442
  14) 1440.00;  0.191
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12300.00 TO NODE  12301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   924.36
  ELEVATION DATA: UPSTREAM(FEET) =   1712.53  DOWNSTREAM(FEET) =   1490.12

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.417
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.419
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.30     1.000     0   14.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.70
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =     12.70

**************************************************************************
  FLOW PROCESS FROM NODE  12301.00 TO NODE  12302.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1490.12  DOWNSTREAM(FEET) =   1117.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1564.45   CHANNEL SLOPE =  0.2380
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.114
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.51
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   17.89
  SUBAREA AREA(ACRES) =    39.97       SUBAREA RUNOFF(CFS) =   65.26
  EFFECTIVE AREA(ACRES) =     46.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       46.6          PEAK FLOW RATE(CFS) =      76.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   8.92
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12302.00 =    2488.81 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1117.78  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2216.41   CHANNEL SLOPE =  0.1520
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.09
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.847
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     112.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.77
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   4.21
  Tc(MIN.) =   22.10
  SUBAREA AREA(ACRES) =    51.51       SUBAREA RUNOFF(CFS) =   71.71
  EFFECTIVE AREA(ACRES) =     98.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       98.1         PEAK FLOW RATE(CFS) =     136.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.18   FLOW VELOCITY(FEET/SEC.) =   9.37
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S22.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)           (ACRES)     NODE
      1     5131.89   35.27  0.30( 0.29) 0.96    4745.1   12211.00
      2     5334.05   39.88  0.30( 0.29) 0.96    5344.5   12201.00
      3     5401.62   44.17  0.30( 0.29) 0.96    5817.2   12111.00
      4     5400.86   47.07  0.30( 0.29) 0.96    6150.5   12231.00
      5     5381.09   49.90  0.30( 0.29) 0.96    6444.5   12101.10
      6     5372.16   50.94  0.30( 0.29) 0.96    6542.4   12261.00
      7     5065.15   61.91  0.30( 0.29) 0.96    7307.9   12010.00
      8     4657.78   69.40  0.30( 0.29) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)           (ACRES)     NODE
      1     5131.89   35.27  0.30( 0.29) 0.96    4745.1   12211.00
      2     5334.05   39.88  0.30( 0.29) 0.96    5344.5   12201.00
      3     5401.62   44.17  0.30( 0.29) 0.96    5817.2   12111.00
      4     5400.86   47.07  0.30( 0.29) 0.96    6150.5   12231.00
      5     5381.09   49.90  0.30( 0.29) 0.96    6444.5   12101.10
      6     5372.16   50.94  0.30( 0.29) 0.96    6542.4   12261.00
      7     5065.15   61.91  0.30( 0.29) 0.96    7307.9   12010.00
      8     4657.78   69.40  0.30( 0.29) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    835.60  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1568.10   CHANNEL SLOPE =  0.0349
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.53
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.211
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.15      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5422.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.72
  AVERAGE FLOW DEPTH(FEET) =   7.52   TRAVEL TIME(MIN.) =   1.90
  Tc(MIN.) =   46.08
  SUBAREA AREA(ACRES) =    51.15       SUBAREA RUNOFF(CFS) =   41.95
  EFFECTIVE AREA(ACRES) =   5868.37     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     7481.8         PEAK FLOW RATE(CFS) =    5401.62
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.51   FLOW VELOCITY(FEET/SEC.) =  13.69
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      5131.89   37.21    1.359  0.30( 0.29) 0.96    4796.3   12211.00
     2      5334.05   41.79    1.276  0.30( 0.29) 0.96    5395.7   12201.00
     3      5401.62   46.08    1.211  0.30( 0.29) 0.96    5868.4   12111.00
     4      5400.86   48.98    1.167  0.30( 0.29) 0.96    6201.6   12231.00
     5      5381.09   51.81    1.129  0.30( 0.29) 0.96    6495.6   12101.10
     6      5372.16   52.85    1.115  0.30( 0.29) 0.96    6593.6   12261.00
     7      5065.15   63.85    1.001  0.30( 0.29) 0.96    7359.1   12010.00
     8      4657.78   71.38    0.958  0.30( 0.29) 0.96    7481.8   12000.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       136.64   22.10    1.847  0.30( 0.30) 1.00      98.1   12300.00
 LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      4572.61   22.10    1.847  0.30( 0.29) 0.96    2947.7   12300.00
     2      5225.47   37.21    1.359  0.30( 0.29) 0.96    4894.4   12211.00
     3      5420.25   41.79    1.276  0.30( 0.29) 0.96    5493.8   12201.00
     4      5482.11   46.08    1.211  0.30( 0.29) 0.96    5966.5   12111.00
     5      5477.49   48.98    1.167  0.30( 0.29) 0.96    6299.8   12231.00
     6      5454.29   51.81    1.129  0.30( 0.29) 0.96    6593.8   12101.10
     7      5444.17   52.85    1.115  0.30( 0.29) 0.96    6691.7   12261.00
     8      5127.08   63.85    1.001  0.30( 0.29) 0.96    7457.2   12010.00
     9      4715.91   71.38    0.958  0.30( 0.29) 0.96    7579.9   12000.00
   TOTAL AREA(ACRES) =      7579.9

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     5482.11  Tc(MIN.) =   46.078
 EFFECTIVE AREA(ACRES) =   5966.51  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     7579.9
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12320.00 TO NODE  12321.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    780.80  DOWNSTREAM(FEET) =    761.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2102.41   CHANNEL SLOPE =  0.0091
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.63
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.149
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      180.82      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5551.21
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.45
 AVERAGE FLOW DEPTH(FEET) =  10.62   TRAVEL TIME(MIN.) =   4.15
 Tc(MIN.) =   50.22
 SUBAREA AREA(ACRES) =   180.82       SUBAREA RUNOFF(CFS) =  138.20
 EFFECTIVE AREA(ACRES) =   6147.33     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     7760.8          PEAK FLOW RATE(CFS) =    5482.11
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.56

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.56   FLOW VELOCITY(FEET/SEC.) =   8.42
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12321.00 =   45889.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12321.00 TO NODE  12322.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    761.66  DOWNSTREAM(FEET) =    710.30
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.13   CHANNEL SLOPE =  0.0268
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.16
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.116
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      217.17      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5561.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.54
 AVERAGE FLOW DEPTH(FEET) =   8.15   TRAVEL TIME(MIN.) =   2.55
 Tc(MIN.) =   52.77
 SUBAREA AREA(ACRES) =   217.17       SUBAREA RUNOFF(CFS) =  159.56
 EFFECTIVE AREA(ACRES) =   6364.50     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     7977.9          PEAK FLOW RATE(CFS) =    5482.11
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.08

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.08   FLOW VELOCITY(FEET/SEC.) =  12.50
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12322.00 =   47805.20 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    710.30  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1977.07   CHANNEL SLOPE =  0.0162
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.23
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.076
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.67      0.30     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5550.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.44
  AVERAGE FLOW DEPTH(FEET) =   9.22   TRAVEL TIME(MIN.) =   3.16
  Tc(MIN.) =   55.92
  SUBAREA AREA(ACRES) =   194.67       SUBAREA RUNOFF(CFS) =  135.95
  EFFECTIVE AREA(ACRES) =   6559.17     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     8172.6         PEAK FLOW RATE(CFS) =    5482.11
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.16   FLOW VELOCITY(FEET/SEC.) =  10.41
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   55.92
  RAINFALL INTENSITY(INCH/HR) =   1.08
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96
  EFFECTIVE STREAM AREA(ACRES) =    6559.17
  TOTAL STREAM AREA(ACRES) =    8172.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    5482.11

****************************************************************************
  FLOW PROCESS FROM NODE  12330.00 TO NODE  12331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   994.42
  ELEVATION DATA: UPSTREAM(FEET) =   1754.00  DOWNSTREAM(FEET) =   1530.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.046
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.335
```



```
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        3.33      0.30     1.000     0   15.05
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.10
  TOTAL AREA(ACRES) =      3.33   PEAK FLOW RATE(CFS) =      6.10

****************************************************************************
  FLOW PROCESS FROM NODE  12331.00 TO NODE  12332.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1530.30  DOWNSTREAM(FEET) =   1412.81
  CHANNEL LENGTH THRU SUBAREA(FEET) =   946.66   CHANNEL SLOPE =  0.1241
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.098
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.08      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.16
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   18.10
  SUBAREA AREA(ACRES) =    28.08       SUBAREA RUNOFF(CFS) =   45.44
  EFFECTIVE AREA(ACRES) =     31.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.4         PEAK FLOW RATE(CFS) =      50.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   6.30
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12332.00 =    1941.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12332.00 TO NODE  12333.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1412.81  DOWNSTREAM(FEET) =   1235.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.37   CHANNEL SLOPE =  0.0907
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.802
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       44.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.64
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   4.92
  Tc(MIN.) =   23.02
  SUBAREA AREA(ACRES) =    44.96       SUBAREA RUNOFF(CFS) =   60.79
  EFFECTIVE AREA(ACRES) =     76.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.4         PEAK FLOW RATE(CFS) =     103.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.16   FLOW VELOCITY(FEET/SEC.) =   7.19
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12333.00 =    3900.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12333.00 TO NODE  12334.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1235.19  DOWNSTREAM(FEET) =   1013.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1921.81   CHANNEL SLOPE =  0.1151
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.21
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.628
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.21
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   3.90
  Tc(MIN.) =   26.92
  SUBAREA AREA(ACRES) =    30.50       SUBAREA RUNOFF(CFS) =   36.46
  EFFECTIVE AREA(ACRES) =    106.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.9         PEAK FLOW RATE(CFS) =     127.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   8.33
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12334.00 =    5822.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12334.00 TO NODE  12335.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



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  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1013.96  DOWNSTREAM(FEET) =    809.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2029.80   CHANNEL SLOPE =  0.1006
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.493
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     206.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.23
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   3.67
  Tc(MIN.) =   30.59
  SUBAREA AREA(ACRES) =   145.82       SUBAREA RUNOFF(CFS) =  156.59
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =     271.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.95   FLOW VELOCITY(FEET/SEC.) =  10.02
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12335.00 =    7852.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    809.84  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.44   CHANNEL SLOPE =  0.0691
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.422
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     296.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.03
  AVERAGE FLOW DEPTH(FEET) =   2.26   TRAVEL TIME(MIN.) =   3.52
  Tc(MIN.) =   34.10
  SUBAREA AREA(ACRES) =    50.71       SUBAREA RUNOFF(CFS) =   51.22
  EFFECTIVE AREA(ACRES) =    303.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.4         PEAK FLOW RATE(CFS) =     306.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

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 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.30

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.30   FLOW VELOCITY(FEET/SEC.) =   9.12
 LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12340.00 =    9757.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   34.10
 RAINFALL INTENSITY(INCH/HR) =   1.42
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     303.40
 TOTAL STREAM AREA(ACRES) =     303.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     306.43

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     4572.61   32.42    1.456  0.30( 0.29) 0.97    3540.4   12300.00
     1     5225.47   47.17    1.195  0.30( 0.29) 0.97    5487.1   12211.00
     1     5420.25   51.67    1.130  0.30( 0.29) 0.96    6086.5   12201.00
     1     5482.11   55.92    1.076  0.30( 0.29) 0.96    6559.2   12111.00
     1     5477.49   58.83    1.038  0.30( 0.29) 0.96    6892.4   12231.00
     1     5454.29   61.67    1.013  0.30( 0.29) 0.96    7186.4   12101.10
     1     5444.17   62.72    1.007  0.30( 0.29) 0.96    7284.4   12261.00
     1     5127.08   73.88    0.944  0.30( 0.29) 0.97    8049.9   12010.00
     1     4715.91   81.65    0.900  0.30( 0.29) 0.97    8172.6   12000.00
     2      306.43   34.10    1.422  0.30( 0.30) 1.00     303.4   12330.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     4872.73   32.42    1.456  0.30( 0.29) 0.97    3828.8   12300.00
     2     4953.56   34.10    1.422  0.30( 0.29) 0.97    4066.0   12330.00
     3     5469.80   47.17    1.195  0.30( 0.29) 0.97    5790.5   12211.00
     4     5647.03   51.67    1.130  0.30( 0.29) 0.97    6389.9   12201.00
     5     5693.91   55.92    1.076  0.30( 0.29) 0.97    6862.6   12111.00
     6     5679.04   58.83    1.038  0.30( 0.29) 0.97    7195.8   12231.00
     7     5649.13   61.67    1.013  0.30( 0.29) 0.96    7489.8   12101.10
     8     5637.38   62.72    1.007  0.30( 0.29) 0.96    7587.8   12261.00
     9     5302.92   73.88    0.944  0.30( 0.29) 0.97    8353.3   12010.00
    10     4879.66   81.65    0.900  0.30( 0.29) 0.97    8476.0   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    5693.91    Tc(MIN.) =    55.92
 EFFECTIVE AREA(ACRES) =    6862.57   AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
```



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 TOTAL AREA(ACRES) =     8476.0
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12340.00 TO NODE  12341.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    678.19  DOWNSTREAM(FEET) =    630.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2827.23   CHANNEL SLOPE =  0.0170
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.34
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.021
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      317.33      0.30     0.999     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5796.95
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.73
 AVERAGE FLOW DEPTH(FEET) =   9.32   TRAVEL TIME(MIN.) =   4.39
 Tc(MIN.) =   60.31
 SUBAREA AREA(ACRES) =   317.33       SUBAREA RUNOFF(CFS) =  206.08
 EFFECTIVE AREA(ACRES) =   7179.90     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     8793.3         PEAK FLOW RATE(CFS) =    5693.91
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.23

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.23   FLOW VELOCITY(FEET/SEC.) =  10.69
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12341.00 =   52609.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12341.00 TO NODE  12342.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    630.21  DOWNSTREAM(FEET) =    601.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2006.47   CHANNEL SLOPE =  0.0142
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.68
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.002
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      124.13      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5733.14
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.04
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  AVERAGE FLOW DEPTH(FEET) =   9.68   TRAVEL TIME(MIN.) =   3.33
  Tc(MIN.) =   63.65
  SUBAREA AREA(ACRES) =   124.13       SUBAREA RUNOFF(CFS) =   78.46
  EFFECTIVE AREA(ACRES) =   7304.03     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     8917.5         PEAK FLOW RATE(CFS) =    5693.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.64   FLOW VELOCITY(FEET/SEC.) =  10.02
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12342.00 =   54615.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    601.66  DOWNSTREAM(FEET) =    572.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.49   CHANNEL SLOPE =  0.0156
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.46
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.985
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.92      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5723.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.37
  AVERAGE FLOW DEPTH(FEET) =   9.46   TRAVEL TIME(MIN.) =   3.03
  Tc(MIN.) =   66.68
  SUBAREA AREA(ACRES) =    96.92       SUBAREA RUNOFF(CFS) =   59.75
  EFFECTIVE AREA(ACRES) =   7400.95     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     9014.4         PEAK FLOW RATE(CFS) =    5693.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.43   FLOW VELOCITY(FEET/SEC.) =  10.36
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     9014.4  TC(MIN.) =     66.68
  EFFECTIVE AREA(ACRES) =   7400.95  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.968
  PEAK FLOW RATE(CFS)   =    5693.91

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```


NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	4872.73	43.61	1.249	0.30(0.29)	0.97	4367.2	12300.00
2	4953.56	45.24	1.224	0.30(0.29)	0.97	4604.4	12330.00
3	5469.80	58.03	1.048	0.30(0.29)	0.97	6328.9	12211.00
4	5647.03	62.44	1.009	0.30(0.29)	0.97	6928.2	12201.00
5	5693.91	66.68	0.985	0.30(0.29)	0.97	7400.9	12111.00
6	5679.04	69.59	0.968	0.30(0.29)	0.97	7734.2	12231.00
7	5649.13	72.44	0.952	0.30(0.29)	0.97	8028.2	12101.10
8	5637.38	73.50	0.946	0.30(0.29)	0.97	8126.2	12261.00
9	5302.92	84.84	0.881	0.30(0.29)	0.97	8891.7	12010.00
10	4879.66	92.85	0.841	0.30(0.29)	0.97	9014.4	12000.00

```
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S24.DAT
  TIME/DATE OF STUDY: 13:29 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.601
   2)   10.00;  3.025
   3)   15.00;  2.339
   4)   20.00;  1.950
   5)   25.00;  1.705
   6)   30.00;  1.505
   7)   40.00;  1.303
   8)   50.00;  1.152
   9)   60.00;  1.023
  10)   90.00;  0.852
  11)  120.00;  0.739
  12)  180.00;  0.611
  13)  360.00;  0.442
  14) 1440.00;  0.191
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12400.00 TO NODE  12401.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   981.52
  ELEVATION DATA: UPSTREAM(FEET) =   2579.17  DOWNSTREAM(FEET) =   2249.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.811
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.502
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        8.82      0.30     1.000     0   13.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     17.48
  TOTAL AREA(ACRES) =      8.82   PEAK FLOW RATE(CFS) =     17.48

**************************************************************************
  FLOW PROCESS FROM NODE  12401.00 TO NODE  12402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2249.14  DOWNSTREAM(FEET) =   2103.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   975.11   CHANNEL SLOPE =  0.1490
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.76
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.251
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.29      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.99
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   2.33
  Tc(MIN.) =   16.14
  SUBAREA AREA(ACRES) =    46.29       SUBAREA RUNOFF(CFS) =   81.26
  EFFECTIVE AREA(ACRES) =     55.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.1          PEAK FLOW RATE(CFS) =      96.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   8.32
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12402.00 =    1956.63 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12402.00 TO NODE  12403.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2103.89  DOWNSTREAM(FEET) =   1771.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.50   CHANNEL SLOPE =  0.1768
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.17
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.005
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     138.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.91
  AVERAGE FLOW DEPTH(FEET) =   1.14   TRAVEL TIME(MIN.) =   3.16
  Tc(MIN.) =   19.30
  SUBAREA AREA(ACRES) =    54.97       SUBAREA RUNOFF(CFS) =   84.33
  EFFECTIVE AREA(ACRES) =    110.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =     168.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.28   FLOW VELOCITY(FEET/SEC.) =  10.53
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12403.00 =    3837.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12403.00 TO NODE  12404.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1771.34  DOWNSTREAM(FEET) =   1462.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2888.53   CHANNEL SLOPE =  0.1070
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.88
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.748
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     249.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.00
  AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   4.82
  Tc(MIN.) =   24.11
  SUBAREA AREA(ACRES) =   123.02       SUBAREA RUNOFF(CFS) =  160.37
  EFFECTIVE AREA(ACRES) =    233.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      233.1         PEAK FLOW RATE(CFS) =     303.87
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.03   FLOW VELOCITY(FEET/SEC.) =  10.62
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12404.00 =    6725.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12404.00 TO NODE  12405.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1462.30  DOWNSTREAM(FEET) =   1308.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.25   CHANNEL SLOPE =  0.0800
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.621
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      241.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     447.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.70
  AVERAGE FLOW DEPTH(FEET) =   2.71   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =   27.11
  SUBAREA AREA(ACRES) =   241.71       SUBAREA RUNOFF(CFS) =  287.28
  EFFECTIVE AREA(ACRES) =    474.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      474.8         PEAK FLOW RATE(CFS) =     564.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.06   FLOW VELOCITY(FEET/SEC.) =  11.43
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12405.00 =    8650.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12405.00 TO NODE  12406.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.28  DOWNSTREAM(FEET) =   1154.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1923.41   CHANNEL SLOPE =  0.0802
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.515
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.96      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     695.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.13
  AVERAGE FLOW DEPTH(FEET) =   3.41   TRAVEL TIME(MIN.) =   2.64
  Tc(MIN.) =   29.75
  SUBAREA AREA(ACRES) =   238.96       SUBAREA RUNOFF(CFS) =  261.28
  EFFECTIVE AREA(ACRES) =    713.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      713.8         PEAK FLOW RATE(CFS) =     780.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.62   FLOW VELOCITY(FEET/SEC.) =  12.51
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12406.00 =   10574.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1154.02  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1607.69   CHANNEL SLOPE =  0.0503
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.16
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.459
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     810.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.66
  AVERAGE FLOW DEPTH(FEET) =   4.15   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   32.27
  SUBAREA AREA(ACRES) =    58.02       SUBAREA RUNOFF(CFS) =   60.53
  EFFECTIVE AREA(ACRES) =    771.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      771.8         PEAK FLOW RATE(CFS) =     805.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.14   FLOW VELOCITY(FEET/SEC.) =  10.65
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   32.27
  RAINFALL INTENSITY(INCH/HR) =   1.46
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     771.79
  TOTAL STREAM AREA(ACRES) =     771.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     805.24

****************************************************************************
  FLOW PROCESS FROM NODE  12410.00 TO NODE  12411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   966.15
  ELEVATION DATA: UPSTREAM(FEET) =   2215.42  DOWNSTREAM(FEET) =   1909.05

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.886
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.492
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.99      0.30     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     17.73
  TOTAL AREA(ACRES) =      8.99   PEAK FLOW RATE(CFS) =     17.73

****************************************************************************
  FLOW PROCESS FROM NODE  12411.00 TO NODE  12412.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1909.05  DOWNSTREAM(FEET) =   1794.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.59   CHANNEL SLOPE =  0.1215
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.199
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.40
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   2.91
  Tc(MIN.) =   16.80
  SUBAREA AREA(ACRES) =    18.56       SUBAREA RUNOFF(CFS) =   31.73
  EFFECTIVE AREA(ACRES) =     27.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.5         PEAK FLOW RATE(CFS) =      47.09
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   6.08
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12412.00 =    1909.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12412.00 TO NODE  12413.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.38  DOWNSTREAM(FEET) =   1649.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.82   CHANNEL SLOPE =  0.1560
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.031
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.16
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   18.95
  SUBAREA AREA(ACRES) =    16.09       SUBAREA RUNOFF(CFS) =   25.07
  EFFECTIVE AREA(ACRES) =     43.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       43.6         PEAK FLOW RATE(CFS) =      68.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   7.51
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12413.00 =    2836.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12413.00 TO NODE  12414.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1649.76  DOWNSTREAM(FEET) =   1365.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1906.16   CHANNEL SLOPE =  0.1490
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.826
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.14      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     119.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.91
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   3.57
  Tc(MIN.) =   22.52
  SUBAREA AREA(ACRES) =    75.14       SUBAREA RUNOFF(CFS) =  103.23
  EFFECTIVE AREA(ACRES) =    118.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.8          PEAK FLOW RATE(CFS) =     163.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   9.82
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12414.00 =    4742.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1365.78  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3038.90   CHANNEL SLOPE =  0.0963
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.95
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.595
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     251.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.67
  AVERAGE FLOW DEPTH(FEET) =   1.89   TRAVEL TIME(MIN.) =   5.24
  Tc(MIN.) =   27.76
  SUBAREA AREA(ACRES) =   151.43       SUBAREA RUNOFF(CFS) =  176.45
  EFFECTIVE AREA(ACRES) =    270.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      270.2          PEAK FLOW RATE(CFS) =     314.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.13   FLOW VELOCITY(FEET/SEC.) =  10.34
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12420.00 =    7781.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
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 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   27.76
 RAINFALL INTENSITY(INCH/HR) =   1.59
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     270.21
 TOTAL STREAM AREA(ACRES) =     270.21
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     314.86

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      805.24   32.27    1.459  0.30( 0.30) 1.00     771.8   12400.00
     2      314.86   27.76    1.595  0.30( 0.30) 1.00     270.2   12410.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1088.52   27.76    1.595  0.30( 0.30) 1.00     934.2   12410.00
     2     1087.16   32.27    1.459  0.30( 0.30) 1.00    1042.0   12400.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1088.52    Tc(MIN.) =    27.76
 EFFECTIVE AREA(ACRES) =     934.17   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1042.0
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12420.00 TO NODE  12421.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1073.11  DOWNSTREAM(FEET) =   1005.32
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2235.12   CHANNEL SLOPE =  0.0303
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.74
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.474
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      218.57      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1203.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.84
 AVERAGE FLOW DEPTH(FEET) =   5.71   TRAVEL TIME(MIN.) =   3.79
 Tc(MIN.) =   31.55
 SUBAREA AREA(ACRES) =   218.57       SUBAREA RUNOFF(CFS) =  230.91
 EFFECTIVE AREA(ACRES) =   1152.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
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 TOTAL AREA(ACRES) =     1260.6         PEAK FLOW RATE(CFS) =    1217.84
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.74

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.74   FLOW VELOCITY(FEET/SEC.) =   9.87
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12421.00 =   14417.13 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1217.84   31.55    1.474  0.30( 0.30) 1.00    1152.7   12410.00
     2     1228.22   36.06    1.383  0.30( 0.30) 1.00    1260.6   12400.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1228.22  Tc(MIN.) =   36.06
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1260.57

****************************************************************************
 FLOW PROCESS FROM NODE  12421.00 TO NODE  12422.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1005.32  DOWNSTREAM(FEET) =    879.13
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.31   CHANNEL SLOPE =  0.0451
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.48
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.302
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      241.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1337.18
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.71
 AVERAGE FLOW DEPTH(FEET) =   5.46   TRAVEL TIME(MIN.) =   3.99
 Tc(MIN.) =   40.05
 SUBAREA AREA(ACRES) =   241.55       SUBAREA RUNOFF(CFS) =  217.90
 EFFECTIVE AREA(ACRES) =   1502.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1502.1         PEAK FLOW RATE(CFS) =    1355.05
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.50

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.50   FLOW VELOCITY(FEET/SEC.) =  11.74
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12422.00 =   17217.44 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1371.94   35.53    1.393  0.30( 0.30) 1.00    1394.3   12410.00
     2     1355.05   40.05    1.302  0.30( 0.30) 1.00    1502.1   12400.00
```

```
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1371.94  Tc(MIN.) =   35.53
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1394.29

****************************************************************************
 FLOW PROCESS FROM NODE  12422.00 TO NODE  12423.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    879.13  DOWNSTREAM(FEET) =    815.17
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.90   CHANNEL SLOPE =  0.0333
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.10
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.333
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      151.63      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1442.41
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.68
 AVERAGE FLOW DEPTH(FEET) =   6.09   TRAVEL TIME(MIN.) =   3.00
 Tc(MIN.) =   38.53
 SUBAREA AREA(ACRES) =   151.63       SUBAREA RUNOFF(CFS) =  140.94
 EFFECTIVE AREA(ACRES) =   1545.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1653.8         PEAK FLOW RATE(CFS) =    1436.94
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.08

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.08   FLOW VELOCITY(FEET/SEC.) =  10.67
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12423.00 =   19136.34 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1436.94   38.53    1.333  0.30( 0.30) 1.00    1545.9   12410.00
     2     1424.25   43.06    1.257  0.30( 0.30) 1.00    1653.8   12400.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1436.94  Tc(MIN.) =   38.53
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1545.92

****************************************************************************
 FLOW PROCESS FROM NODE  12423.00 TO NODE  12424.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    815.17  DOWNSTREAM(FEET) =    696.54
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2870.82   CHANNEL SLOPE =  0.0413
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
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 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.89
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.263
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      122.40      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1490.00
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.65
 AVERAGE FLOW DEPTH(FEET) =   5.88   TRAVEL TIME(MIN.) =   4.11
 Tc(MIN.) =   42.64
 SUBAREA AREA(ACRES) =   122.40       SUBAREA RUNOFF(CFS) =  106.11
 EFFECTIVE AREA(ACRES) =   1668.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1776.2         PEAK FLOW RATE(CFS) =    1446.35
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.79

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.79   FLOW VELOCITY(FEET/SEC.) =  11.56
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12424.00 =   22007.16 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1446.35   42.64    1.263  0.30( 0.30) 1.00    1668.3   12410.00
     2     1430.25   47.18    1.195  0.30( 0.30) 1.00    1776.2   12400.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1446.35  Tc(MIN.) =   42.64
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1668.32

****************************************************************************
 FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    696.54  DOWNSTREAM(FEET) =    572.29
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3680.45   CHANNEL SLOPE =  0.0338
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.16
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.178
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       96.54      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1484.48
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.81
 AVERAGE FLOW DEPTH(FEET) =   6.15   TRAVEL TIME(MIN.) =   5.67
 Tc(MIN.) =   48.31
 SUBAREA AREA(ACRES) =    96.54       SUBAREA RUNOFF(CFS) =   76.25
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  EFFECTIVE AREA(ACRES) =   1764.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1872.7         PEAK FLOW RATE(CFS) =    1446.35
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.08   FLOW VELOCITY(FEET/SEC.) =  10.74
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12425.00 =   25687.61 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1446.35   48.31    1.178  0.30( 0.30) 1.00    1764.9   12410.00
      2     1430.25   52.87    1.115  0.30( 0.30) 1.00    1872.7   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1446.35  Tc(MIN.) =   48.31
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1764.86
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1872.7  TC(MIN.) =     48.31
  EFFECTIVE AREA(ACRES) =   1764.86  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1446.35

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1446.35   48.31    1.178  0.30( 0.30) 1.00    1764.9   12410.00
      2     1430.25   52.87    1.115  0.30( 0.30) 1.00    1872.7   12400.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S25.DAT
  TIME/DATE OF STUDY: 13:29 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.015
   2)   10.00;  3.260
   3)   15.00;  2.478
   4)   20.00;  2.042
   5)   25.00;  1.778
   6)   30.00;  1.557
   7)   40.00;  1.358
   8)   50.00;  1.204
   9)   60.00;  1.081
  10)   90.00;  0.914
  11)  120.00;  0.805
  12)  180.00;  0.674
  13)  360.00;  0.502
  14) 1440.00;  0.222
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12500.00 TO NODE  12501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   927.04
  ELEVATION DATA: UPSTREAM(FEET) =   1638.22  DOWNSTREAM(FEET) =   1356.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.770
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.671
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        8.89      0.30     1.000     0   13.77
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     18.97
  TOTAL AREA(ACRES) =      8.89   PEAK FLOW RATE(CFS) =     18.97

**************************************************************************
  FLOW PROCESS FROM NODE  12501.00 TO NODE  12502.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1356.00  DOWNSTREAM(FEET) =   1203.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1004.73   CHANNEL SLOPE =  0.1519
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.352
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       24.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.26
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   2.67
  Tc(MIN.) =   16.44
  SUBAREA AREA(ACRES) =    24.30       SUBAREA RUNOFF(CFS) =   44.88
  EFFECTIVE AREA(ACRES) =     33.19     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.2          PEAK FLOW RATE(CFS) =      61.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   7.18
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12502.00 =    1931.77 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12502.00 TO NODE  12503.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1203.37  DOWNSTREAM(FEET) =    987.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.62   CHANNEL SLOPE =  0.1147
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.032
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     132.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.42
  AVERAGE FLOW DEPTH(FEET) =   1.25   TRAVEL TIME(MIN.) =   3.73
  Tc(MIN.) =   20.18
  SUBAREA AREA(ACRES) =    90.42       SUBAREA RUNOFF(CFS) =  140.98
  EFFECTIVE AREA(ACRES) =    123.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      123.6         PEAK FLOW RATE(CFS) =     192.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.55   FLOW VELOCITY(FEET/SEC.) =   9.48
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12503.00 =    3816.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12503.00 TO NODE  12504.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    987.23  DOWNSTREAM(FEET) =    870.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1478.57   CHANNEL SLOPE =  0.0792
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.02
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.889
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     252.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.05
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   2.72
  Tc(MIN.) =   22.90
  SUBAREA AREA(ACRES) =    84.07       SUBAREA RUNOFF(CFS) =  120.21
  EFFECTIVE AREA(ACRES) =    207.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.7         PEAK FLOW RATE(CFS) =     296.95
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.18   FLOW VELOCITY(FEET/SEC.) =   9.49
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12504.00 =    5294.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12504.00 TO NODE  12505.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.07  DOWNSTREAM(FEET) =    729.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1915.52   CHANNEL SLOPE =  0.0736
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.45
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.725
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     348.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.68
  AVERAGE FLOW DEPTH(FEET) =   2.42   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   26.20
  SUBAREA AREA(ACRES) =    79.84       SUBAREA RUNOFF(CFS) =  102.39
  EFFECTIVE AREA(ACRES) =    287.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      287.5         PEAK FLOW RATE(CFS) =     368.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.50   FLOW VELOCITY(FEET/SEC.) =   9.83
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12505.00 =    7210.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    729.02  DOWNSTREAM(FEET) =    549.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2961.35   CHANNEL SLOPE =  0.0605
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.82
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.529
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.77      0.30     1.000     -
```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 412.30
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.46
AVERAGE FLOW DEPTH(FEET) = 2.80 TRAVEL TIME(MIN.) = 5.22
Tc(MIN.) = 31.41
SUBAREA AREA(ACRES) = 78.77 SUBAREA RUNOFF(CFS) = 87.12
EFFECTIVE AREA(ACRES) = 366.29 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 366.3 PEAK FLOW RATE(CFS) = 405.10
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.77 FLOW VELOCITY(FEET/SEC.) = 9.43
LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

****
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 10

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==

****
FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: S23.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4872.73	43.61	0.30(0.29)	0.97	4367.2	12300.00
2	4953.56	45.24	0.30(0.29)	0.97	4604.4	12330.00
3	5469.80	58.03	0.30(0.29)	0.97	6328.9	12211.00
4	5647.03	62.44	0.30(0.29)	0.97	6928.2	12201.00
5	5693.91	66.68	0.30(0.29)	0.97	7400.9	12111.00
6	5679.04	69.59	0.30(0.29)	0.97	7734.2	12231.00
7	5649.13	72.44	0.30(0.29)	0.97	8028.2	12101.10
8	5637.38	73.50	0.30(0.29)	0.97	8126.2	12261.00
9	5302.92	84.84	0.30(0.29)	0.97	8891.7	12010.00
10	4879.66	92.85	0.30(0.29)	0.97	9014.4	12000.00

TOTAL AREA(ACRES) = 9014.4

****
FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: S24.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1446.35	48.31	0.30(0.30)	1.00	1764.9	12410.00
2	1430.25	52.87	0.30(0.30)	1.00	1872.7	12400.00

TOTAL AREA(ACRES) = 1872.7

****
FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 14.0

>>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1446.35	48.31	0.30(0.30)	1.00	1764.9	12410.00
2	1430.25	52.87	0.30(0.30)	1.00	1872.7	12400.00

TOTAL AREA(ACRES) = 1872.7

****
FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1446.35	48.31	1.230	0.30(0.30)	1.00	1764.9	12410.00
2	1430.25	52.87	1.169	0.30(0.30)	1.00	1872.7	12400.00

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4872.73	43.61	1.303	0.30(0.29)	0.97	4367.2	12300.00
2	4953.56	45.24	1.278	0.30(0.29)	0.97	4604.4	12330.00
3	5469.80	58.03	1.106	0.30(0.29)	0.97	6328.9	12211.00
4	5647.03	62.44	1.068	0.30(0.29)	0.97	6928.2	12201.00
5	5693.91	66.68	1.044	0.30(0.29)	0.97	7400.9	12111.00
6	5679.04	69.59	1.028	0.30(0.29)	0.97	7734.2	12231.00
7	5649.13	72.44	1.012	0.30(0.29)	0.97	8028.2	12101.10
8	5637.38	73.50	1.006	0.30(0.29)	0.97	8126.2	12261.00
9	5302.92	84.84	0.943	0.30(0.29)	0.97	8891.7	12010.00
10	4879.66	92.85	0.903	0.30(0.29)	0.97	9014.4	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6279.82	43.61	1.303	0.30(0.29)	0.98	5960.3	12300.00
2	6376.79	45.24	1.278	0.30(0.29)	0.98	6257.3	12330.00
3	6523.64	48.31	1.230	0.30(0.29)	0.98	6782.6	12410.00
4	6691.50	52.87	1.169	0.30(0.29)	0.98	7504.9	12400.00
5	6795.58	58.03	1.106	0.30(0.29)	0.98	8201.6	12211.00
6	6910.58	62.44	1.068	0.30(0.29)	0.98	8800.9	12201.00
7	6918.48	66.68	1.044	0.30(0.29)	0.97	9273.6	12111.00
8	6876.82	69.59	1.028	0.30(0.29)	0.97	9606.9	12231.00
9	6820.61	72.44	1.012	0.30(0.29)	0.97	9900.9	12101.10
10	6799.16	73.50	1.006	0.30(0.29)	0.97	9998.8	12261.00
11	6360.33	84.84	0.943	0.30(0.29)	0.98	10764.4	12010.00
12	5872.52	92.85	0.903	0.30(0.29)	0.98	10887.1	12000.00

TOTAL AREA(ACRES) = 10887.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 6918.48 Tc(MIN.) = 66.675
EFFECTIVE AREA(ACRES) = 9273.64 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 10887.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

****
FLOW PROCESS FROM NODE 12425.00 TO NODE 12520.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 572.29 DOWNSTREAM(FEET) = 549.92
CHANNEL LENGTH THRU SUBAREA(FEET) = 1724.25 CHANNEL SLOPE = 0.0130
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.11
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.028
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.96	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6957.12
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.87
AVERAGE FLOW DEPTH(FEET) = 9.11 TRAVEL TIME(MIN.) = 2.91
Tc(MIN.) = 69.59
SUBAREA AREA(ACRES) = 117.96 SUBAREA RUNOFF(CFS) = 77.28
EFFECTIVE AREA(ACRES) = 9391.60 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 11005.0 PEAK FLOW RATE(CFS) = 6918.48
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.08 FLOW VELOCITY(FEET/SEC.) = 9.86
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6279.82	46.60	1.257	0.30(0.29)	0.98	6078.3	12300.00
2	6376.79	48.22	1.232	0.30(0.29)	0.98	6375.2	12330.00
3	6523.64	51.27	1.189	0.30(0.29)	0.98	6900.5	12410.00
4	6691.50	55.80	1.133	0.30(0.29)	0.98	7622.9	12400.00
5	6795.58	60.96	1.076	0.30(0.29)	0.98	8319.5	12211.00
6	6910.58	65.35	1.052	0.30(0.29)	0.98	8918.9	12201.00
7	6918.48	69.59	1.028	0.30(0.29)	0.97	9391.6	12111.00
8	6876.82	72.50	1.012	0.30(0.29)	0.97	9724.9	12231.00
9	6820.61	75.37	0.996	0.30(0.29)	0.97	10018.9	12101.10
10	6799.16	76.42	0.990	0.30(0.29)	0.97	10116.8	12261.00
11	6360.33	87.82	0.926	0.30(0.29)	0.98	10882.3	12010.00
12	5938.84	95.90	0.892	0.30(0.29)	0.98	11005.0	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 6918.48 Tc(MIN.) = 69.59
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 9391.60

****
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6279.82	46.60	1.257	0.30(0.29)	0.98	6078.3	12300.00
2	6376.79	48.22	1.232	0.30(0.29)	0.98	6375.2	12330.00
3	6523.64	51.27	1.189	0.30(0.29)	0.98	6900.5	12410.00
4	6691.50	55.80	1.133	0.30(0.29)	0.98	7622.9	12400.00
5	6795.58	60.96	1.076	0.30(0.29)	0.98	8319.5	12211.00
6	6910.58	65.35	1.052	0.30(0.29)	0.98	8918.9	12201.00
7	6918.48	69.59	1.028	0.30(0.29)	0.97	9391.6	12111.00
8	6876.82	72.50	1.012	0.30(0.29)	0.97	9724.9	12231.00
9	6820.61	75.37	0.996	0.30(0.29)	0.97	10018.9	12101.10
10	6799.16	76.42	0.990	0.30(0.29)	0.97	10116.8	12261.00
11	6360.33	87.82	0.926	0.30(0.29)	0.98	10882.3	12010.00
12	5938.84	95.90	0.892	0.30(0.29)	0.98	11005.0	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	405.10	31.41	1.529	0.30(0.30)	1.00	366.3	12500.00

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5835.52	31.41	1.529	0.30(0.29)	0.98	4464.0	12500.00
2	6595.23	46.60	1.257	0.30(0.29)	0.98	6444.6	12300.00
3	6683.97	48.22	1.232	0.30(0.29)	0.98	6741.5	12330.00
4	6816.67	51.27	1.189	0.30(0.29)	0.98	7266.8	12410.00
5	6966.15	55.80	1.133	0.30(0.29)	0.98	7989.2	12400.00
6	7051.46	60.96	1.076	0.30(0.29)	0.98	8685.8	12211.00
7	7158.36	65.35	1.052	0.30(0.29)	0.98	9285.2	12201.00
8	7158.46	69.59	1.028	0.30(0.29)	0.98	9757.9	12111.00
9	7111.42	72.50	1.012	0.30(0.29)	0.98	10091.2	12231.00
10	7049.93	75.37	0.996	0.30(0.29)	0.97	10385.1	12101.10
11	7026.53	76.42	0.990	0.30(0.29)	0.97	10483.1	12261.00
12	6566.68	87.82	0.926	0.30(0.29)	0.98	11248.6	12010.00
13	6134.11	95.90	0.892	0.30(0.29)	0.98	11371.3	12000.00

TOTAL AREA(ACRES) = 11371.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 7158.46 Tc(MIN.) = 69.586
EFFECTIVE AREA(ACRES) = 9757.89 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11371.3
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

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****************************************************************************
  FLOW PROCESS FROM NODE  12520.00 TO NODE  12521.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    549.92  DOWNSTREAM(FEET) =    525.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1934.41   CHANNEL SLOPE =  0.0127
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.010
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7185.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.88
  AVERAGE FLOW DEPTH(FEET) =   9.33   TRAVEL TIME(MIN.) =   3.26
  Tc(MIN.) =   72.85
  SUBAREA AREA(ACRES) =    85.91       SUBAREA RUNOFF(CFS) =   54.87
  EFFECTIVE AREA(ACRES) =   9843.80     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    11457.2         PEAK FLOW RATE(CFS) =    7158.46
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.31   FLOW VELOCITY(FEET/SEC.) =   9.87
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12521.00 =   60159.12 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5835.52   34.87    1.460  0.30( 0.29) 0.98    4549.9   12500.00
      2     6595.23   49.94    1.205  0.30( 0.29) 0.98    6530.5   12300.00
      3     6683.97   51.55    1.185  0.30( 0.29) 0.98    6827.4   12330.00
      4     6816.67   54.58    1.148  0.30( 0.29) 0.98    7352.7   12410.00
      5     6966.15   59.09    1.093  0.30( 0.29) 0.98    8075.1   12400.00
      6     7051.46   64.24    1.058  0.30( 0.29) 0.98    8771.7   12211.00
      7     7158.36   68.61    1.033  0.30( 0.29) 0.98    9371.1   12201.00
      8     7158.46   72.85    1.010  0.30( 0.29) 0.98    9843.8   12111.00
      9     7111.42   75.77    0.993  0.30( 0.29) 0.98   10177.1   12231.00
     10     7049.93   78.64    0.977  0.30( 0.29) 0.97   10471.1   12101.10
     11     7026.53   79.71    0.971  0.30( 0.29) 0.97   10569.0   12261.00
     12     6566.68   91.17    0.909  0.30( 0.29) 0.98   11334.5   12010.00
     13     6134.11   99.31    0.880  0.30( 0.29) 0.98   11457.2   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    7158.46  Tc(MIN.) =   72.85
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    9843.80

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  FLOW PROCESS FROM NODE  12521.00 TO NODE  12522.00 IS CODE =  56
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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    525.43  DOWNSTREAM(FEET) =    490.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3335.01   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.95
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.976
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      539.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7322.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.24
  AVERAGE FLOW DEPTH(FEET) =   9.93   TRAVEL TIME(MIN.) =   6.01
  Tc(MIN.) =   78.86
  SUBAREA AREA(ACRES) =   539.82       SUBAREA RUNOFF(CFS) =  328.46
  EFFECTIVE AREA(ACRES) =  10383.62     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    11997.0         PEAK FLOW RATE(CFS) =    7158.46
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.81   FLOW VELOCITY(FEET/SEC.) =   9.19
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12522.00 =   63494.13 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5835.52   41.21    1.340  0.30( 0.30) 0.98    5089.7   12500.00
      2     6595.23   56.08    1.130  0.30( 0.30) 0.98    7070.3   12300.00
      3     6683.97   57.67    1.110  0.30( 0.29) 0.98    7367.2   12330.00
      4     6816.67   60.66    1.078  0.30( 0.29) 0.98    7892.5   12410.00
      5     6966.15   65.14    1.053  0.30( 0.29) 0.98    8614.9   12400.00
      6     7051.46   70.27    1.024  0.30( 0.29) 0.98    9311.5   12211.00
      7     7158.36   74.62    1.000  0.30( 0.29) 0.98    9910.9   12201.00
      8     7158.46   78.86    0.976  0.30( 0.29) 0.98   10383.6   12111.00
      9     7111.42   81.80    0.960  0.30( 0.29) 0.98   10716.9   12231.00
     10     7049.93   84.68    0.943  0.30( 0.29) 0.98   11010.9   12101.10
     11     7026.53   85.75    0.937  0.30( 0.29) 0.98   11108.8   12261.00
     12     6566.68   97.33    0.887  0.30( 0.29) 0.98   11874.3   12010.00
     13     6134.11  105.60    0.857  0.30( 0.29) 0.98   11997.0   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    7158.46  Tc(MIN.) =   78.86
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10383.62

****************************************************************************
  FLOW PROCESS FROM NODE  12522.00 TO NODE  12523.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
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 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    490.87  DOWNSTREAM(FEET) =    467.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1961.26   CHANNEL SLOPE =  0.0118
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.55
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.957
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      321.58      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7253.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.67
 AVERAGE FLOW DEPTH(FEET) =   9.54   TRAVEL TIME(MIN.) =   3.38
 Tc(MIN.) =   82.24
 SUBAREA AREA(ACRES) =   321.58       SUBAREA RUNOFF(CFS) =  190.20
 EFFECTIVE AREA(ACRES) =  10705.20     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =    12318.6         PEAK FLOW RATE(CFS) =    7158.46
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.47

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.47   FLOW VELOCITY(FEET/SEC.) =   9.64
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12523.00 =   65455.39 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5835.52   44.79    1.285  0.30( 0.30) 0.99    5411.3   12500.00
     2     6595.23   59.53    1.087  0.30( 0.30) 0.98    7391.9   12300.00
     3     6683.97   61.11    1.075  0.30( 0.30) 0.98    7688.8   12330.00
     4     6816.67   64.09    1.059  0.30( 0.29) 0.98    8214.1   12410.00
     5     6966.15   68.55    1.034  0.30( 0.29) 0.98    8936.5   12400.00
     6     7051.46   73.66    1.005  0.30( 0.29) 0.98    9633.1   12211.00
     7     7158.36   78.00    0.981  0.30( 0.29) 0.98   10232.5   12201.00
     8     7158.46   82.24    0.957  0.30( 0.29) 0.98   10705.2   12111.00
     9     7111.42   85.18    0.941  0.30( 0.29) 0.98   11038.5   12231.00
    10     7049.93   88.08    0.924  0.30( 0.29) 0.98   11332.5   12101.10
    11     7026.53   89.15    0.918  0.30( 0.29) 0.98   11430.4   12261.00
    12     6566.68  100.79    0.874  0.30( 0.29) 0.98   12195.9   12010.00
    13     6134.11  109.13    0.844  0.30( 0.29) 0.98   12318.6   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    7158.46  Tc(MIN.) =   82.24
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10705.20

****************************************************************************
 FLOW PROCESS FROM NODE  12523.00 TO NODE  12524.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
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 ELEVATION DATA: UPSTREAM(FEET) =    467.63  DOWNSTREAM(FEET) =    436.35
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2841.85   CHANNEL SLOPE =  0.0110
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.72
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.929
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      298.62      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7242.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.42
 AVERAGE FLOW DEPTH(FEET) =   9.72   TRAVEL TIME(MIN.) =   5.03
 Tc(MIN.) =   87.27
 SUBAREA AREA(ACRES) =   298.62       SUBAREA RUNOFF(CFS) =  169.06
 EFFECTIVE AREA(ACRES) =  11003.82     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =    12617.2         PEAK FLOW RATE(CFS) =    7158.46
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.66

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.66   FLOW VELOCITY(FEET/SEC.) =   9.39
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12524.00 =   68297.24 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5835.52   50.11    1.203  0.30( 0.30) 0.99    5709.9   12500.00
     2     6595.23   64.67    1.055  0.30( 0.30) 0.99    7690.5   12300.00
     3     6683.97   66.24    1.047  0.30( 0.30) 0.98    7987.5   12330.00
     4     6816.67   69.18    1.030  0.30( 0.30) 0.98    8512.7   12410.00
     5     6966.15   73.61    1.005  0.30( 0.29) 0.98    9235.1   12400.00
     6     7051.46   78.71    0.977  0.30( 0.29) 0.98    9931.7   12211.00
     7     7158.36   83.03    0.953  0.30( 0.29) 0.98   10531.1   12201.00
     8     7158.46   87.27    0.929  0.30( 0.29) 0.98   11003.8   12111.00
     9     7111.42   90.22    0.913  0.30( 0.29) 0.98   11337.1   12231.00
    10     7049.93   93.13    0.902  0.30( 0.29) 0.98   11631.1   12101.10
    11     7026.53   94.20    0.898  0.30( 0.29) 0.98   11729.0   12261.00
    12     6566.68  105.95    0.856  0.30( 0.29) 0.98   12494.5   12010.00
    13     6134.11  114.39    0.825  0.30( 0.29) 0.98   12617.2   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    7158.46  Tc(MIN.) =   87.27
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   11003.82

****************************************************************************
 FLOW PROCESS FROM NODE  12524.00 TO NODE  12525.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    436.35  DOWNSTREAM(FEET) =    415.23
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2812.14   CHANNEL SLOPE =  0.0075
```

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.73
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.903
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	251.20	0.30	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7226.71
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.21
AVERAGE FLOW DEPTH(FEET) = 10.72 TRAVEL TIME(MIN.) = 5.71
Tc(MIN.) = 92.98
SUBAREA AREA(ACRES) = 251.20 SUBAREA RUNOFF(CFS) = 136.52
EFFECTIVE AREA(ACRES) = 11255.02 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 12868.4 PEAK FLOW RATE(CFS) = 7158.46
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.67 FLOW VELOCITY(FEET/SEC.) = 8.18
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12525.00 = 71109.38 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5835.52	56.15	1.129	0.30(0.30)	0.99	5961.1	12500.00
2	6595.23	70.51	1.023	0.30(0.30)	0.99	7941.7	12300.00
3	6683.97	72.05	1.014	0.30(0.30)	0.99	8238.7	12330.00
4	6816.67	74.97	0.998	0.30(0.30)	0.98	8763.9	12410.00
5	6966.15	79.37	0.973	0.30(0.29)	0.98	9486.3	12400.00
6	7051.46	84.45	0.945	0.30(0.29)	0.98	10182.9	12211.00
7	7158.36	88.74	0.921	0.30(0.29)	0.98	10782.3	12201.00
8	7158.46	92.98	0.903	0.30(0.29)	0.98	11255.0	12111.00
9	7111.42	95.95	0.892	0.30(0.29)	0.98	11588.3	12231.00
10	7049.93	98.87	0.881	0.30(0.29)	0.98	11882.3	12101.10
11	7026.53	99.95	0.878	0.30(0.29)	0.98	11980.2	12261.00
12	6566.68	111.80	0.834	0.30(0.29)	0.98	12745.7	12010.00
13	6134.11	120.35	0.804	0.30(0.29)	0.98	12868.4	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 7158.46 Tc(MIN.) = 92.98
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 11255.02

****
FLOW PROCESS FROM NODE 12525.00 TO NODE 12526.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 415.23 DOWNSTREAM(FEET) = 380.28
CHANNEL LENGTH THRU SUBAREA(FEET) = 2934.09 CHANNEL SLOPE = 0.0119
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

*ESTIMATED CHANNEL HEIGHT(FEET) = 6.75
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.882
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	247.71	0.30	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7223.75
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.43
AVERAGE FLOW DEPTH(FEET) = 6.75 TRAVEL TIME(MIN.) = 5.80
Tc(MIN.) = 98.78
SUBAREA AREA(ACRES) = 247.71 SUBAREA RUNOFF(CFS) = 130.58
EFFECTIVE AREA(ACRES) = 11502.73 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 13116.2 PEAK FLOW RATE(CFS) = 7158.46
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.72 FLOW VELOCITY(FEET/SEC.) = 8.40
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12526.00 = 74043.48 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5835.52	62.33	1.068	0.30(0.30)	0.99	6208.9	12500.00
2	6595.23	76.46	0.989	0.30(0.30)	0.99	8189.4	12300.00
3	6683.97	77.98	0.981	0.30(0.30)	0.99	8486.4	12330.00
4	6816.67	80.86	0.965	0.30(0.30)	0.98	9011.7	12410.00
5	6966.15	85.22	0.940	0.30(0.29)	0.98	9734.0	12400.00
6	7051.46	90.28	0.913	0.30(0.29)	0.98	10430.7	12211.00
7	7158.36	94.54	0.897	0.30(0.29)	0.98	11030.0	12201.00
8	7158.46	98.78	0.882	0.30(0.29)	0.98	11502.7	12111.00
9	7111.42	101.76	0.871	0.30(0.29)	0.98	11836.0	12231.00
10	7049.93	104.69	0.860	0.30(0.29)	0.98	12130.0	12101.10
11	7026.53	105.78	0.856	0.30(0.29)	0.98	12227.9	12261.00
12	6566.68	117.77	0.813	0.30(0.29)	0.98	12993.4	12010.00
13	6134.11	126.45	0.791	0.30(0.29)	0.98	13116.2	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 7158.46 Tc(MIN.) = 98.78
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 11502.73

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 380.28 DOWNSTREAM(FEET) = 347.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 3113.51 CHANNEL SLOPE = 0.0105
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.97
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.858

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	120.94	0.30	0.974	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.974
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7189.27
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.08
AVERAGE FLOW DEPTH(FEET) = 6.96 TRAVEL TIME(MIN.) = 6.43
Tc(MIN.) = 105.21
SUBAREA AREA(ACRES) = 120.94 SUBAREA RUNOFF(CFS) = 61.64
EFFECTIVE AREA(ACRES) = 11623.67 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 13237.1 PEAK FLOW RATE(CFS) = 7158.46
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.95 FLOW VELOCITY(FEET/SEC.) = 8.06
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5835.52	69.19	1.030	0.30(0.30)	0.99	6329.8	12500.00
2	6595.23	83.06	0.953	0.30(0.30)	0.99	8310.3	12300.00
3	6683.97	84.55	0.944	0.30(0.30)	0.98	8607.3	12330.00
4	6816.67	87.39	0.928	0.30(0.30)	0.98	9132.6	12410.00
5	6966.15	91.70	0.908	0.30(0.29)	0.98	9854.9	12400.00
6	7051.46	96.73	0.889	0.30(0.29)	0.98	10551.6	12211.00
7	7158.36	100.97	0.874	0.30(0.29)	0.98	11151.0	12201.00
8	7158.46	105.21	0.858	0.30(0.29)	0.98	11623.7	12111.00
9	7111.42	108.20	0.848	0.30(0.29)	0.98	11956.9	12231.00
10	7049.93	111.16	0.837	0.30(0.29)	0.98	12250.9	12101.10
11	7026.53	112.25	0.833	0.30(0.29)	0.98	12348.9	12261.00
12	6566.68	124.37	0.795	0.30(0.29)	0.98	13114.4	12010.00
13	6134.11	133.21	0.776	0.30(0.29)	0.98	13237.1	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 7158.46 Tc(MIN.) = 105.21
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 11623.67

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 13237.1 TC(MIN.) = 105.21
EFFECTIVE AREA(ACRES) = 11623.67 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.979
PEAK FLOW RATE(CFS) = 7158.46

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5835.52	69.19	1.030	0.30(0.30)	0.99	6329.8	12500.00
2	6595.23	83.06	0.953	0.30(0.30)	0.99	8310.3	12300.00
3	6683.97	84.55	0.944	0.30(0.30)	0.98	8607.3	12330.00
4	6816.67	87.39	0.928	0.30(0.30)	0.98	9132.6	12410.00
5	6966.15	91.70	0.908	0.30(0.29)	0.98	9854.9	12400.00

6	7051.46	96.73	0.889	0.30(0.29)	0.98	10551.6	12211.00
7	7158.36	100.97	0.874	0.30(0.29)	0.98	11151.0	12201.00
8	7158.46	105.21	0.858	0.30(0.29)	0.98	11623.7	12111.00
9	7111.42	108.20	0.848	0.30(0.29)	0.98	11956.9	12231.00
10	7049.93	111.16	0.837	0.30(0.29)	0.98	12250.9	12101.10
11	7026.53	112.25	0.833	0.30(0.29)	0.98	12348.9	12261.00
12	6566.68	124.37	0.795	0.30(0.29)	0.98	13114.4	12010.00
13	6134.11	133.21	0.776	0.30(0.29)	0.98	13237.1	12000.00

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S26.DAT
  TIME/DATE OF STUDY: 09:26 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.984
   2)   10.00;  3.242
   3)   15.00;  2.468
   4)   20.00;  2.035
   5)   25.00;  1.772
   6)   30.00;  1.553
   7)   40.00;  1.354
   8)   50.00;  1.200
   9)   60.00;  1.077
  10)   90.00;  0.909
  11)  120.00;  0.800
  12)  180.00;  0.670
  13)  360.00;  0.498
  14) 1200.00;  0.219
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S19.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    19731.89   17.07  0.30( 0.30) 0.99    5870.7   40200.00
      2    22495.68   31.84  0.30( 0.30) 0.99   11044.5   40100.00
      3    24694.85   41.75  0.30( 0.30) 0.99   14347.3   11801.00
      4    27272.79   53.20  0.30( 0.30) 0.99   18874.7   11530.00
      5    28706.92   62.22  0.30( 0.30) 0.99   23506.0   11910.00
      6    30921.98   72.78  0.30( 0.30) 0.99   29834.4   11350.00
      7    31589.73   77.64  0.30( 0.30) 0.99   33007.5   11130.00
      8    31523.52   83.67  0.30( 0.30) 0.99   35934.6   12300.00
      9    31469.13   87.54  0.30( 0.30) 0.99   37996.7   11620.00
     10    31198.94   92.31  0.30( 0.30) 0.99   40195.2   12400.00
     11    30960.00   95.52  0.30( 0.30) 0.99   41508.1   11111.00
     12    30533.32  101.59  0.30( 0.30) 0.99   43596.7   12201.00
     13    29822.34  108.83  0.30( 0.30) 0.99   45489.2   12231.00
     14    29531.56  111.78  0.30( 0.30) 0.99   46180.4   12101.10
     15    29059.00  116.04  0.30( 0.30) 0.99   47043.3   10400.00
     16    28694.61  118.67  0.30( 0.30) 0.99   47497.7   10200.00
     17    27792.82  125.01  0.30( 0.30) 0.99   48488.5   12010.00
     18    26924.78  130.07  0.30( 0.30) 0.99   48752.1   10210.00
     19    26391.86  133.86  0.30( 0.30) 0.99   48897.2   12000.00
     20    23385.06  158.96  0.30( 0.30) 0.99   49511.8   10100.00
   TOTAL AREA(ACRES) =    49511.8

**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    19731.89   17.07  0.30( 0.30) 0.99    5870.7   40200.00
      2    22495.68   31.84  0.30( 0.30) 0.99   11044.5   40100.00
      3    24694.85   41.75  0.30( 0.30) 0.99   14347.3   11801.00
      4    27272.79   53.20  0.30( 0.30) 0.99   18874.7   11530.00
      5    28706.92   62.22  0.30( 0.30) 0.99   23506.0   11910.00
      6    30921.98   72.78  0.30( 0.30) 0.99   29834.4   11350.00
      7    31589.73   77.64  0.30( 0.30) 0.99   33007.5   11130.00
      8    31523.52   83.67  0.30( 0.30) 0.99   35934.6   12300.00
      9    31469.13   87.54  0.30( 0.30) 0.99   37996.7   11620.00
     10    31198.94   92.31  0.30( 0.30) 0.99   40195.2   12400.00
     11    30960.00   95.52  0.30( 0.30) 0.99   41508.1   11111.00
     12    30533.32  101.59  0.30( 0.30) 0.99   43596.7   12201.00
     13    29822.34  108.83  0.30( 0.30) 0.99   45489.2   12231.00
     14    29531.56  111.78  0.30( 0.30) 0.99   46180.4   12101.10
     15    29059.00  116.04  0.30( 0.30) 0.99   47043.3   10400.00
     16    28694.61  118.67  0.30( 0.30) 0.99   47497.7   10200.00
     17    27792.82  125.01  0.30( 0.30) 0.99   48488.5   12010.00
     18    26924.78  130.07  0.30( 0.30) 0.99   48752.1   10210.00
```

```
    19    26391.86  133.86  0.30( 0.30) 0.99   48897.2   12000.00
    20    23385.06  158.96  0.30( 0.30) 0.99   49511.8   10100.00
   TOTAL AREA(ACRES) =     49511.8

****************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  12601.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    341.63  DOWNSTREAM(FEET) =    325.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1467.93   CHANNEL SLOPE =  0.0113
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.37
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.971
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.11      0.30     0.992     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   31594.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.09
  AVERAGE FLOW DEPTH(FEET) =   7.37   TRAVEL TIME(MIN.) =   1.35
  Tc(MIN.) =   79.00
  SUBAREA AREA(ACRES) =    14.11       SUBAREA RUNOFF(CFS) =    8.55
  EFFECTIVE AREA(ACRES) =  33021.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    49525.9         PEAK FLOW RATE(CFS) =   31589.73
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.37   FLOW VELOCITY(FEET/SEC.) =  18.08
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19731.89   18.66    2.151  0.30( 0.30) 0.99    5884.8   40200.00
      2    22495.68   33.36    1.486  0.30( 0.30) 0.99   11058.7   40100.00
      3    24694.85   43.23    1.304  0.30( 0.30) 0.99   14361.4   11801.00
      4    27272.79   54.63    1.143  0.30( 0.30) 0.99   18888.8   11530.00
      5    28706.92   63.62    1.057  0.30( 0.30) 0.99   23520.1   11910.00
      6    30921.98   74.14    0.998  0.30( 0.30) 0.99   29848.5   11350.00
      7    31589.73   79.00    0.971  0.30( 0.30) 0.99   33021.6   11130.00
      8    31523.52   85.03    0.937  0.30( 0.30) 0.99   35948.8   12300.00
      9    31469.13   88.90    0.915  0.30( 0.30) 0.99   38010.8   11620.00
     10    31198.94   93.67    0.896  0.30( 0.30) 0.99   40209.3   12400.00
     11    30960.00   96.89    0.884  0.30( 0.30) 0.99   41522.2   11111.00
     12    30533.32  102.96    0.862  0.30( 0.30) 0.99   43610.8   12201.00
     13    29822.34  110.21    0.836  0.30( 0.30) 0.99   45503.4   12231.00
     14    29531.56  113.17    0.825  0.30( 0.30) 0.99   46194.5   12101.10
     15    29059.00  117.43    0.809  0.30( 0.30) 0.99   47057.4   10400.00
     16    28694.61  120.07    0.800  0.30( 0.30) 0.99   47511.8   10200.00
```



```
     17    27792.82  126.43    0.786  0.30( 0.30) 0.99   48502.6   12010.00
     18    26924.78  131.50    0.775  0.30( 0.30) 0.99   48766.2   10210.00
     19    26391.86  135.30    0.767  0.30( 0.30) 0.99   48911.3   12000.00
     20    23385.06  160.46    0.712  0.30( 0.30) 0.99   49525.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   31589.73  Tc(MIN.) =   79.00
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   33021.60

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610318W.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      195.70   16.97  0.30( 0.30) 1.00     108.9   31800.00
      2      183.01   20.50  0.30( 0.30) 1.00     119.0   31810.00
    TOTAL AREA(ACRES) =      119.0

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19731.89   18.66    2.151  0.30( 0.30) 0.99    5884.8   40200.00
      2    22495.68   33.36    1.486  0.30( 0.30) 0.99   11058.7   40100.00
      3    24694.85   43.23    1.304  0.30( 0.30) 0.99   14361.4   11801.00
      4    27272.79   54.63    1.143  0.30( 0.30) 0.99   18888.8   11530.00
      5    28706.92   63.62    1.057  0.30( 0.30) 0.99   23520.1   11910.00
      6    30921.98   74.14    0.998  0.30( 0.30) 0.99   29848.5   11350.00
      7    31589.73   79.00    0.971  0.30( 0.30) 0.99   33021.6   11130.00
      8    31523.52   85.03    0.937  0.30( 0.30) 0.99   35948.8   12300.00
      9    31469.13   88.90    0.915  0.30( 0.30) 0.99   38010.8   11620.00
     10    31198.94   93.67    0.896  0.30( 0.30) 0.99   40209.3   12400.00
     11    30960.00   96.89    0.884  0.30( 0.30) 0.99   41522.2   11111.00
     12    30533.32  102.96    0.862  0.30( 0.30) 0.99   43610.8   12201.00
     13    29822.34  110.21    0.836  0.30( 0.30) 0.99   45503.4   12231.00
     14    29531.56  113.17    0.825  0.30( 0.30) 0.99   46194.5   12101.10
     15    29059.00  117.43    0.809  0.30( 0.30) 0.99   47057.4   10400.00
     16    28694.61  120.07    0.800  0.30( 0.30) 0.99   47511.8   10200.00
     17    27792.82  126.43    0.786  0.30( 0.30) 0.99   48502.6   12010.00
     18    26924.78  131.50    0.775  0.30( 0.30) 0.99   48766.2   10210.00
     19    26391.86  135.30    0.767  0.30( 0.30) 0.99   48911.3   12000.00
     20    23385.06  160.46    0.712  0.30( 0.30) 0.99   49525.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      195.70   16.97    2.298  0.30( 0.30) 1.00     108.9   31800.00
      2      183.01   20.50    2.009  0.30( 0.30) 1.00     119.0   31810.00
```

LONGEST FLOWPATH FROM NODE 31810.00 TO NODE 12601.00 = 4599.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19557.47	16.97	2.298	0.30(0.30)	0.99	5460.7	31800.00
2	19921.52	18.66	2.151	0.30(0.30)	0.99	5998.5	40200.00
3	20261.29	20.50	2.009	0.30(0.30)	0.99	6652.3	31810.00
4	22622.74	33.36	1.486	0.30(0.30)	0.99	11177.7	40100.00
5	24802.42	43.23	1.304	0.30(0.30)	0.99	14480.4	11801.00
6	27363.10	54.63	1.143	0.30(0.30)	0.99	19007.9	11530.00
7	28787.98	63.62	1.057	0.30(0.30)	0.99	23639.1	11910.00
8	30996.73	74.14	0.998	0.30(0.30)	0.99	29967.5	11350.00
9	31661.57	79.00	0.971	0.30(0.30)	0.99	33140.6	11130.00
10	31591.73	85.03	0.937	0.30(0.30)	0.99	36067.8	12300.00
11	31535.03	88.90	0.915	0.30(0.30)	0.99	38129.8	11620.00
12	31262.74	93.67	0.896	0.30(0.30)	0.99	40328.4	12400.00
13	31022.56	96.89	0.884	0.30(0.30)	0.99	41641.2	11111.00
14	30593.51	102.96	0.862	0.30(0.30)	0.99	43729.8	12201.00
15	29879.71	110.21	0.836	0.30(0.30)	0.99	45622.4	12231.00
16	29587.78	113.17	0.825	0.30(0.30)	0.99	46313.5	12101.10
17	29113.56	117.43	0.809	0.30(0.30)	0.99	47176.4	10400.00
18	28748.15	120.07	0.800	0.30(0.30)	0.99	47630.8	10200.00
19	27844.89	126.43	0.786	0.30(0.30)	0.99	48621.7	12010.00
20	26975.67	131.50	0.775	0.30(0.30)	0.99	48885.2	10210.00
21	26441.87	135.30	0.767	0.30(0.30)	0.99	49030.4	12000.00
22	23429.23	160.46	0.712	0.30(0.30)	0.99	49644.9	10100.00

TOTAL AREA(ACRES) = 49644.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 31661.57 Tc(MIN.) = 78.997
EFFECTIVE AREA(ACRES) = 33140.62 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49644.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

****
FLOW PROCESS FROM NODE 12601.00 TO NODE 12602.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 325.00 DOWNSTREAM(FEET) = 313.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1377.46 CHANNEL SLOPE = 0.0087
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.96
CHANNEL FLOW THRU SUBAREA(CFS) = 31661.57
FLOW VELOCITY(FEET/SEC.) = 16.58 FLOW DEPTH(FEET) = 7.96
TRAVEL TIME(MIN.) = 1.38 Tc(MIN.) = 80.38
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12602.00 = 101245.91 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19557.47	18.60	2.156	0.30(0.30)	0.99	5460.7	31800.00
2	19921.52	20.28	2.020	0.30(0.30)	0.99	5998.5	40200.00
3	20261.29	22.11	1.924	0.30(0.30)	0.99	6652.3	31810.00
4	22622.74	34.91	1.455	0.30(0.30)	0.99	11177.7	40100.00
5	24802.42	44.73	1.281	0.30(0.30)	0.99	14480.4	11801.00
6	27363.10	56.08	1.125	0.30(0.30)	0.99	19007.9	11530.00
7	28787.98	65.04	1.049	0.30(0.30)	0.99	23639.1	11910.00
8	30996.73	75.54	0.990	0.30(0.30)	0.99	29967.5	11350.00
9	31661.57	80.38	0.963	0.30(0.30)	0.99	33140.6	11130.00
10	31591.73	86.41	0.929	0.30(0.30)	0.99	36067.8	12300.00
11	31535.03	90.28	0.908	0.30(0.30)	0.99	38129.8	11620.00
12	31262.74	95.07	0.891	0.30(0.30)	0.99	40328.4	12400.00
13	31022.56	98.28	0.879	0.30(0.30)	0.99	41641.2	11111.00
14	30593.51	104.36	0.857	0.30(0.30)	0.99	43729.8	12201.00
15	29879.71	111.62	0.830	0.30(0.30)	0.99	45622.4	12231.00
16	29587.78	114.58	0.820	0.30(0.30)	0.99	46313.5	12101.10
17	29113.56	118.86	0.804	0.30(0.30)	0.99	47176.4	10400.00
18	28748.15	121.50	0.797	0.30(0.30)	0.99	47630.8	10200.00
19	27844.89	127.87	0.783	0.30(0.30)	0.99	48621.7	12010.00
20	26975.67	132.96	0.772	0.30(0.30)	0.99	48885.2	10210.00
21	26441.87	136.77	0.764	0.30(0.30)	0.99	49030.4	12000.00
22	23429.23	161.99	0.709	0.30(0.30)	0.99	49644.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 31661.57 Tc(MIN.) = 80.38
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33140.62

****
FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 313.00 DOWNSTREAM(FEET) = 310.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 312.40 CHANNEL SLOPE = 0.0096
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.75
CHANNEL FLOW THRU SUBAREA(CFS) = 31661.57
FLOW VELOCITY(FEET/SEC.) = 17.12 FLOW DEPTH(FEET) = 7.75
TRAVEL TIME(MIN.) = 0.30 Tc(MIN.) = 80.69
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19557.47	18.96	2.125	0.30(0.30)	0.99	5460.7	31800.00
2	19921.52	20.64	2.002	0.30(0.30)	0.99	5998.5	40200.00
3	20261.29	22.47	1.905	0.30(0.30)	0.99	6652.3	31810.00
4	22622.74	35.25	1.449	0.30(0.30)	0.99	11177.7	40100.00
5	24802.42	45.06	1.276	0.30(0.30)	0.99	14480.4	11801.00
6	27363.10	56.40	1.121	0.30(0.30)	0.99	19007.9	11530.00
7	28787.98	65.36	1.047	0.30(0.30)	0.99	23639.1	11910.00
8	30996.73	75.84	0.988	0.30(0.30)	0.99	29967.5	11350.00
9	31661.57	80.69	0.961	0.30(0.30)	0.99	33140.6	11130.00
10	31591.73	86.72	0.927	0.30(0.30)	0.99	36067.8	12300.00
11	31535.03	90.59	0.907	0.30(0.30)	0.99	38129.8	11620.00
12	31262.74	95.37	0.889	0.30(0.30)	0.99	40328.4	12400.00
13	31022.56	98.59	0.878	0.30(0.30)	0.99	41641.2	11111.00
14	30593.51	104.67	0.856	0.30(0.30)	0.99	43729.8	12201.00
15	29879.71	111.93	0.829	0.30(0.30)	0.99	45622.4	12231.00

```
    16    29587.78  114.90    0.819  0.30( 0.30) 0.99   46313.5   12101.10
    17    29113.56  119.17    0.803  0.30( 0.30) 0.99   47176.4   10400.00
    18    28748.15  121.81    0.796  0.30( 0.30) 0.99   47630.8   10200.00
    19    27844.89  128.19    0.782  0.30( 0.30) 0.99   48621.7   12010.00
    20    26975.67  133.28    0.771  0.30( 0.30) 0.99   48885.2   10210.00
    21    26441.87  137.09    0.763  0.30( 0.30) 0.99   49030.4   12000.00
    22    23429.23  162.33    0.708  0.30( 0.30) 0.99   49644.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   31661.57  Tc(MIN.) =   80.69
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   33140.62

****************************************************************************
  FLOW PROCESS FROM NODE  12602.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610317W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      114.59   16.74  0.30( 0.30) 1.00      63.1   31700.00
      2      110.15   20.33  0.30( 0.30) 1.00      71.3   31710.00
    TOTAL AREA(ACRES) =       71.3

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19557.47   18.96    2.125  0.30( 0.30) 0.99    5460.7   31800.00
      2    19921.52   20.64    2.002  0.30( 0.30) 0.99    5998.5   40200.00
      3    20261.29   22.47    1.905  0.30( 0.30) 0.99    6652.3   31810.00
      4    22622.74   35.25    1.449  0.30( 0.30) 0.99   11177.7   40100.00
      5    24802.42   45.06    1.276  0.30( 0.30) 0.99   14480.4   11801.00
      6    27363.10   56.40    1.121  0.30( 0.30) 0.99   19007.9   11530.00
      7    28787.98   65.36    1.047  0.30( 0.30) 0.99   23639.1   11910.00
      8    30996.73   75.84    0.988  0.30( 0.30) 0.99   29967.5   11350.00
      9    31661.57   80.69    0.961  0.30( 0.30) 0.99   33140.6   11130.00
     10    31591.73   86.72    0.927  0.30( 0.30) 0.99   36067.8   12300.00
     11    31535.03   90.59    0.907  0.30( 0.30) 0.99   38129.8   11620.00
     12    31262.74   95.37    0.889  0.30( 0.30) 0.99   40328.4   12400.00
     13    31022.56   98.59    0.878  0.30( 0.30) 0.99   41641.2   11111.00
     14    30593.51  104.67    0.856  0.30( 0.30) 0.99   43729.8   12201.00
     15    29879.71  111.93    0.829  0.30( 0.30) 0.99   45622.4   12231.00
     16    29587.78  114.90    0.819  0.30( 0.30) 0.99   46313.5   12101.10
     17    29113.56  119.17    0.803  0.30( 0.30) 0.99   47176.4   10400.00
     18    28748.15  121.81    0.796  0.30( 0.30) 0.99   47630.8   10200.00
```



```
    19    27844.89  128.19    0.782  0.30( 0.30) 0.99   48621.7   12010.00
    20    26975.67  133.28    0.771  0.30( 0.30) 0.99   48885.2   10210.00
    21    26441.87  137.09    0.763  0.30( 0.30) 0.99   49030.4   12000.00
    22    23429.23  162.33    0.708  0.30( 0.30) 0.99   49644.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      114.59   16.74    2.317  0.30( 0.30) 1.00      63.1   31700.00
      2      110.15   20.33    2.017  0.30( 0.30) 1.00      71.3   31710.00
  LONGEST FLOWPATH FROM NODE  31710.00 TO NODE  12603.00 =    3633.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19199.56   16.74    2.317  0.30( 0.30) 0.99    4885.2   31700.00
      2    19669.32   18.96    2.125  0.30( 0.30) 0.99    5528.8   31800.00
      3    19966.27   20.33    2.017  0.30( 0.30) 0.99    5973.2   31710.00
      4    20030.65   20.64    2.002  0.30( 0.30) 0.99    6069.8   40200.00
      5    20364.25   22.47    1.905  0.30( 0.30) 0.99    6723.5   31810.00
      6    22696.40   35.25    1.449  0.30( 0.30) 0.99   11248.9   40100.00
      7    24865.03   45.06    1.276  0.30( 0.30) 0.99   14551.7   11801.00
      8    27415.78   56.40    1.121  0.30( 0.30) 0.99   19079.1   11530.00
      9    28835.89   65.36    1.047  0.30( 0.30) 0.99   23710.4   11910.00
     10    31040.88   75.84    0.988  0.30( 0.30) 0.99   30038.8   11350.00
     11    31703.97   80.69    0.961  0.30( 0.30) 0.99   33211.9   11130.00
     12    31631.97   86.72    0.927  0.30( 0.30) 0.99   36139.0   12300.00
     13    31573.95   90.59    0.907  0.30( 0.30) 0.99   38201.1   11620.00
     14    31300.55   95.37    0.889  0.30( 0.30) 0.99   40399.6   12400.00
     15    31059.62   98.59    0.878  0.30( 0.30) 0.99   41712.5   11111.00
     16    30629.15  104.67    0.856  0.30( 0.30) 0.99   43801.1   12201.00
     17    29913.66  111.93    0.829  0.30( 0.30) 0.99   45693.7   12231.00
     18    29621.04  114.90    0.819  0.30( 0.30) 0.99   46384.8   12101.10
     19    29145.83  119.17    0.803  0.30( 0.30) 0.99   47247.7   10400.00
     20    28779.97  121.81    0.796  0.30( 0.30) 0.99   47702.1   10200.00
     21    27875.82  128.19    0.782  0.30( 0.30) 0.99   48692.9   12010.00
     22    27005.89  133.28    0.771  0.30( 0.30) 0.99   48956.5   10210.00
     23    26471.57  137.09    0.763  0.30( 0.30) 0.99   49101.6   12000.00
     24    23455.42  162.33    0.708  0.30( 0.30) 0.99   49716.2   10100.00
    TOTAL AREA(ACRES) =     49716.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    31703.97  Tc(MIN.) =   80.686
  EFFECTIVE AREA(ACRES) =  33211.90  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49716.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
```

```
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610403W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1       285.71   19.21  0.30( 0.29) 0.97      175.0   40300.00
    TOTAL AREA(ACRES) =       175.0

********************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     19199.56   16.74    2.317  0.30( 0.30) 0.99    4885.2   31700.00
      2     19669.32   18.96    2.125  0.30( 0.30) 0.99    5528.8   31800.00
      3     19966.27   20.33    2.017  0.30( 0.30) 0.99    5973.2   31710.00
      4     20030.65   20.64    2.002  0.30( 0.30) 0.99    6069.8   40200.00
      5     20364.25   22.47    1.905  0.30( 0.30) 0.99    6723.5   31810.00
      6     22696.40   35.25    1.449  0.30( 0.30) 0.99   11248.9   40100.00
      7     24865.03   45.06    1.276  0.30( 0.30) 0.99   14551.7   11801.00
      8     27415.78   56.40    1.121  0.30( 0.30) 0.99   19079.1   11530.00
      9     28835.89   65.36    1.047  0.30( 0.30) 0.99   23710.4   11910.00
     10     31040.88   75.84    0.988  0.30( 0.30) 0.99   30038.8   11350.00
     11     31703.97   80.69    0.961  0.30( 0.30) 0.99   33211.9   11130.00
     12     31631.97   86.72    0.927  0.30( 0.30) 0.99   36139.0   12300.00
     13     31573.95   90.59    0.907  0.30( 0.30) 0.99   38201.1   11620.00
     14     31300.55   95.37    0.889  0.30( 0.30) 0.99   40399.6   12400.00
     15     31059.62   98.59    0.878  0.30( 0.30) 0.99   41712.5   11111.00
     16     30629.15  104.67    0.856  0.30( 0.30) 0.99   43801.1   12201.00
     17     29913.66  111.93    0.829  0.30( 0.30) 0.99   45693.7   12231.00
     18     29621.04  114.90    0.819  0.30( 0.30) 0.99   46384.8   12101.10
     19     29145.83  119.17    0.803  0.30( 0.30) 0.99   47247.7   10400.00
     20     28779.97  121.81    0.796  0.30( 0.30) 0.99   47702.1   10200.00
     21     27875.82  128.19    0.782  0.30( 0.30) 0.99   48692.9   12010.00
     22     27005.89  133.28    0.771  0.30( 0.30) 0.99   48956.5   10210.00
     23     26471.57  137.09    0.763  0.30( 0.30) 0.99   49101.6   12000.00
     24     23455.42  162.33    0.708  0.30( 0.30) 0.99   49716.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1       285.71   19.21    2.103  0.30( 0.29) 0.97     175.0   40300.00
  LONGEST FLOWPATH FROM NODE  40300.00 TO NODE  12603.00 =    5256.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     19477.90   16.74    2.317  0.30( 0.30) 0.99    5037.7   31700.00
      2     19954.67   18.96    2.125  0.30( 0.30) 0.99    5701.6   31800.00
      3     20009.45   19.21    2.103  0.30( 0.30) 0.99    5785.3   40300.00
      4     20238.44   20.33    2.017  0.30( 0.30) 0.99    6148.2   31710.00
      5     20300.33   20.64    2.002  0.30( 0.30) 0.99    6244.9   40200.00
```



```
      6     20618.75   22.47    1.905  0.30( 0.30) 0.99    6898.6   31810.00
      7     22878.96   35.25    1.449  0.30( 0.30) 0.99   11424.0   40100.00
      8     25020.43   45.06    1.276  0.30( 0.30) 0.99   14726.7   11801.00
      9     27546.79   56.40    1.121  0.30( 0.30) 0.99   19254.2   11530.00
     10     28955.21   65.36    1.047  0.30( 0.30) 0.99   23885.4   11910.00
     11     31150.95   75.84    0.988  0.30( 0.30) 0.99   30213.8   11350.00
     12     31809.77   80.69    0.961  0.30( 0.30) 0.99   33386.9   11130.00
     13     31732.45   86.72    0.927  0.30( 0.30) 0.99   36314.1   12300.00
     14     31671.20   90.59    0.907  0.30( 0.30) 0.99   38376.1   11620.00
     15     31395.06   95.37    0.889  0.30( 0.30) 0.99   40574.7   12400.00
     16     31152.29   98.59    0.878  0.30( 0.30) 0.99   41887.5   11111.00
     17     30718.34  104.67    0.856  0.30( 0.30) 0.99   43976.1   12201.00
     18     29998.70  111.93    0.829  0.30( 0.30) 0.99   45868.7   12231.00
     19     29704.38  114.90    0.819  0.30( 0.30) 0.99   46559.9   12101.10
     20     29226.71  119.17    0.803  0.30( 0.30) 0.99   47422.7   10400.00
     21     28859.76  121.81    0.796  0.30( 0.30) 0.99   47877.1   10200.00
     22     27953.44  128.19    0.782  0.30( 0.30) 0.99   48868.0   12010.00
     23     27081.77  133.28    0.771  0.30( 0.30) 0.99   49131.6   10210.00
     24     26546.15  137.09    0.763  0.30( 0.30) 0.99   49276.7   12000.00
     25     23521.38  162.33    0.708  0.30( 0.30) 0.99   49891.2   10100.00
   TOTAL AREA(ACRES) =     49891.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    31809.77  Tc(MIN.) =   80.686
  EFFECTIVE AREA(ACRES) =  33386.95  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49891.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12604.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    310.00  DOWNSTREAM(FEET) =    307.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.69   CHANNEL SLOPE =  0.0065
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.67
  CHANNEL FLOW THRU SUBAREA(CFS) =   31809.77
  FLOW VELOCITY(FEET/SEC.) =  15.08   FLOW DEPTH(FEET) =   8.67
  TRAVEL TIME(MIN.) =   0.51   Tc(MIN.) =   81.19
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12604.00 =  102017.99 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     19477.90   17.34    2.265  0.30( 0.30) 0.99    5037.7   31700.00
      2     19954.67   19.55    2.074  0.30( 0.30) 0.99    5701.6   31800.00
      3     20009.45   19.80    2.052  0.30( 0.30) 0.99    5785.3   40300.00
      4     20238.44   20.93    1.986  0.30( 0.30) 0.99    6148.2   31710.00
      5     20300.33   21.23    1.971  0.30( 0.30) 0.99    6244.9   40200.00
      6     20618.75   23.05    1.874  0.30( 0.30) 0.99    6898.6   31810.00
      7     22878.96   35.82    1.437  0.30( 0.30) 0.99   11424.0   40100.00
      8     25020.43   45.61    1.268  0.30( 0.30) 0.99   14726.7   11801.00
      9     27546.79   56.93    1.115  0.30( 0.30) 0.99   19254.2   11530.00
     10     28955.21   65.88    1.044  0.30( 0.30) 0.99   23885.4   11910.00
```

11	31150.95	76.35	0.985	0.30(0.30)	0.99	30213.8	11350.00
12	31809.77	81.19	0.958	0.30(0.30)	0.99	33386.9	11130.00
13	31732.45	87.23	0.925	0.30(0.30)	0.99	36314.1	12300.00
14	31671.20	91.10	0.905	0.30(0.30)	0.99	38376.1	11620.00
15	31395.06	95.88	0.888	0.30(0.30)	0.99	40574.7	12400.00
16	31152.29	99.10	0.876	0.30(0.30)	0.99	41887.5	11111.00
17	30718.34	105.19	0.854	0.30(0.30)	0.99	43976.1	12201.00
18	29998.70	112.45	0.827	0.30(0.30)	0.99	45868.7	12231.00
19	29704.38	115.41	0.817	0.30(0.30)	0.99	46559.9	12101.10
20	29226.71	119.69	0.801	0.30(0.30)	0.99	47422.7	10400.00
21	28859.76	122.34	0.795	0.30(0.30)	0.99	47877.1	10200.00
22	27953.44	128.72	0.781	0.30(0.30)	0.99	48868.0	12010.00
23	27081.77	133.82	0.770	0.30(0.30)	0.99	49131.6	10210.00
24	26546.15	137.63	0.762	0.30(0.30)	0.99	49276.7	12000.00
25	23521.38	162.89	0.707	0.30(0.30)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 31809.77 Tc(MIN.) = 81.19
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33386.95

****
FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 307.00 DOWNSTREAM(FEET) = 305.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 427.54 CHANNEL SLOPE = 0.0047
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.53
CHANNEL FLOW THRU SUBAREA(CFS) = 31809.77
FLOW VELOCITY(FEET/SEC.) = 13.48 FLOW DEPTH(FEET) = 9.53
TRAVEL TIME(MIN.) = 0.53 Tc(MIN.) = 81.72
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.00 = 102445.53 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19477.90	17.96	2.211	0.30(0.30)	0.99	5037.7	31700.00
2	19954.67	20.17	2.026	0.30(0.30)	0.99	5701.6	31800.00
3	20009.45	20.42	2.013	0.30(0.30)	0.99	5785.3	40300.00
4	20238.44	21.54	1.954	0.30(0.30)	0.99	6148.2	31710.00
5	20300.33	21.84	1.938	0.30(0.30)	0.99	6244.9	40200.00
6	20618.75	23.66	1.842	0.30(0.30)	0.99	6898.6	31810.00
7	22878.96	36.41	1.426	0.30(0.30)	0.99	11424.0	40100.00
8	25020.43	46.18	1.259	0.30(0.30)	0.99	14726.7	11801.00
9	27546.79	57.49	1.108	0.30(0.30)	0.99	19254.2	11530.00
10	28955.21	66.43	1.041	0.30(0.30)	0.99	23885.4	11910.00
11	31150.95	76.89	0.982	0.30(0.30)	0.99	30213.8	11350.00
12	31809.77	81.72	0.955	0.30(0.30)	0.99	33386.9	11130.00
13	31732.45	87.76	0.922	0.30(0.30)	0.99	36314.1	12300.00

14	31671.20	91.63	0.903	0.30(0.30)	0.99	38376.1	11620.00
15	31395.06	96.41	0.886	0.30(0.30)	0.99	40574.7	12400.00
16	31152.29	99.63	0.874	0.30(0.30)	0.99	41887.5	11111.00
17	30718.34	105.72	0.852	0.30(0.30)	0.99	43976.1	12201.00
18	29998.70	112.99	0.825	0.30(0.30)	0.99	45868.7	12231.00
19	29704.38	115.96	0.815	0.30(0.30)	0.99	46559.9	12101.10
20	29226.71	120.24	0.799	0.30(0.30)	0.99	47422.7	10400.00
21	28859.76	122.88	0.794	0.30(0.30)	0.99	47877.1	10200.00
22	27953.44	129.27	0.780	0.30(0.30)	0.99	48868.0	12010.00
23	27081.77	134.38	0.769	0.30(0.30)	0.99	49131.6	10210.00
24	26546.15	138.19	0.761	0.30(0.30)	0.99	49276.7	12000.00
25	23521.38	163.48	0.706	0.30(0.30)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 31809.77 Tc(MIN.) = 81.72
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33386.95

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========
MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12605.00 TO NODE 12605.30 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 305.00 DOWNSTREAM(FEET) = 302.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 217.28 CHANNEL SLOPE = 0.0138
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 31809.77
FLOW VELOCITY(FEET/SEC.) = 19.34 FLOW DEPTH(FEET) = 7.00
TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 81.91
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19477.90	18.18	2.192	0.30(0.30)	0.99	5037.7	31700.00
2	19954.67	20.39	2.014	0.30(0.30)	0.99	5701.6	31800.00
3	20009.45	20.64	2.001	0.30(0.30)	0.99	5785.3	40300.00
4	20238.44	21.76	1.943	0.30(0.30)	0.99	6148.2	31710.00
5	20300.33	22.06	1.927	0.30(0.30)	0.99	6244.9	40200.00
6	20618.75	23.88	1.831	0.30(0.30)	0.99	6898.6	31810.00
7	22878.96	36.62	1.421	0.30(0.30)	0.99	11424.0	40100.00
8	25020.43	46.38	1.256	0.30(0.30)	0.99	14726.7	11801.00
9	27546.79	57.68	1.105	0.30(0.30)	0.99	19254.2	11530.00
10	28955.21	66.62	1.040	0.30(0.30)	0.99	23885.4	11910.00
11	31150.95	77.07	0.981	0.30(0.30)	0.99	30213.8	11350.00
12	31809.77	81.91	0.954	0.30(0.30)	0.99	33386.9	11130.00
13	31732.45	87.94	0.921	0.30(0.30)	0.99	36314.1	12300.00
14	31671.20	91.81	0.902	0.30(0.30)	0.99	38376.1	11620.00
15	31395.06	96.60	0.885	0.30(0.30)	0.99	40574.7	12400.00

16	31152.29	99.82	0.873	0.30(0.30)	0.99	41887.5	11111.00
17	30718.34	105.91	0.851	0.30(0.30)	0.99	43976.1	12201.00
18	29998.70	113.18	0.825	0.30(0.30)	0.99	45868.7	12231.00
19	29704.38	116.15	0.814	0.30(0.30)	0.99	46559.9	12101.10
20	29226.71	120.43	0.799	0.30(0.30)	0.99	47422.7	10400.00
21	28859.76	123.08	0.793	0.30(0.30)	0.99	47877.1	10200.00
22	27953.44	129.47	0.779	0.30(0.30)	0.99	48868.0	12010.00
23	27081.77	134.58	0.768	0.30(0.30)	0.99	49131.6	10210.00
24	26546.15	138.39	0.760	0.30(0.30)	0.99	49276.7	12000.00
25	23521.38	163.68	0.705	0.30(0.30)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 31809.77 Tc(MIN.) = 81.91
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33386.95

****
FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========
MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610404W.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	678.70	18.08	0.30(0.30)	0.99	396.2	40430.00
2	669.61	18.61	0.30(0.30)	0.99	400.5	40440.00
3	645.94	19.82	0.30(0.30)	0.99	409.4	40400.00
4	641.61	20.00	0.30(0.30)	0.99	410.3	40420.00
5	640.93	20.05	0.30(0.30)	0.99	410.5	40410.00

TOTAL AREA(ACRES) = 410.5

****
FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19477.90	18.18	2.192	0.30(0.30)	0.99	5037.7	31700.00
2	19954.67	20.39	2.014	0.30(0.30)	0.99	5701.6	31800.00
3	20009.45	20.64	2.001	0.30(0.30)	0.99	5785.3	40300.00
4	20238.44	21.76	1.943	0.30(0.30)	0.99	6148.2	31710.00
5	20300.33	22.06	1.927	0.30(0.30)	0.99	6244.9	40200.00
6	20618.75	23.88	1.831	0.30(0.30)	0.99	6898.6	31810.00
7	22878.96	36.62	1.421	0.30(0.30)	0.99	11424.0	40100.00
8	25020.43	46.38	1.256	0.30(0.30)	0.99	14726.7	11801.00
9	27546.79	57.68	1.105	0.30(0.30)	0.99	19254.2	11530.00
10	28955.21	66.62	1.040	0.30(0.30)	0.99	23885.4	11910.00
11	31150.95	77.07	0.981	0.30(0.30)	0.99	30213.8	11350.00

12	31809.77	81.91	0.954	0.30(0.30)	0.99	33386.9	11130.00
13	31732.45	87.94	0.921	0.30(0.30)	0.99	36314.1	12300.00
14	31671.20	91.81	0.902	0.30(0.30)	0.99	38376.1	11620.00
15	31395.06	96.60	0.885	0.30(0.30)	0.99	40574.7	12400.00
16	31152.29	99.82	0.873	0.30(0.30)	0.99	41887.5	11111.00
17	30718.34	105.91	0.851	0.30(0.30)	0.99	43976.1	12201.00
18	29998.70	113.18	0.825	0.30(0.30)	0.99	45868.7	12231.00
19	29704.38	116.15	0.814	0.30(0.30)	0.99	46559.9	12101.10
20	29226.71	120.43	0.799	0.30(0.30)	0.99	47422.7	10400.00
21	28859.76	123.08	0.793	0.30(0.30)	0.99	47877.1	10200.00
22	27953.44	129.47	0.779	0.30(0.30)	0.99	48868.0	12010.00
23	27081.77	134.58	0.768	0.30(0.30)	0.99	49131.6	10210.00
24	26546.15	138.39	0.760	0.30(0.30)	0.99	49276.7	12000.00
25	23521.38	163.68	0.705	0.30(0.30)	0.99	49891.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	678.70	18.08	2.201	0.30(0.30)	0.99	396.2	40430.00
2	669.61	18.61	2.155	0.30(0.30)	0.99	400.5	40440.00
3	645.94	19.82	2.051	0.30(0.30)	0.99	409.4	40400.00
4	641.61	20.00	2.035	0.30(0.30)	0.99	410.3	40420.00
5	640.93	20.05	2.033	0.30(0.30)	0.99	410.5	40410.00

LONGEST FLOWPATH FROM NODE 40400.00 TO NODE 12605.30 = 7428.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20137.52	18.08	2.201	0.30(0.30)	0.99	5405.4	40430.00
2	20154.85	18.18	2.192	0.30(0.30)	0.99	5434.7	31700.00
3	20240.30	18.61	2.155	0.30(0.30)	0.99	5567.5	40440.00
4	20477.46	19.82	2.051	0.30(0.30)	0.99	5939.5	40400.00
5	20511.43	20.00	2.035	0.30(0.30)	0.99	5993.7	40420.00
6	20521.17	20.05	2.033	0.30(0.30)	0.99	6008.4	40410.00
7	20588.91	20.39	2.014	0.30(0.30)	0.99	6112.0	31800.00
8	20638.83	20.64	2.001	0.30(0.30)	0.99	6195.8	40300.00
9	20846.09	21.76	1.943	0.30(0.30)	0.99	6558.7	31710.00
10	20902.17	22.06	1.927	0.30(0.30)	0.99	6655.3	40200.00
11	21185.16	23.88	1.831	0.30(0.30)	0.99	7309.1	31810.00
12	23294.13	36.62	1.421	0.30(0.30)	0.99	11834.5	40100.00
13	25374.40	46.38	1.256	0.30(0.30)	0.99	15137.2	11801.00
14	27845.29	57.68	1.105	0.30(0.30)	0.99	19664.6	11530.00
15	29229.49	66.62	1.040	0.30(0.30)	0.99	24295.9	11910.00
16	31403.61	77.07	0.981	0.30(0.30)	0.99	30624.3	11350.00
17	32052.44	81.91	0.954	0.30(0.30)	0.99	33797.4	11130.00
18	31962.63	87.94	0.921	0.30(0.30)	0.99	36724.6	12300.00
19	31894.70	91.81	0.902	0.30(0.30)	0.99	38786.6	11620.00
20	31612.13	96.60	0.885	0.30(0.30)	0.99	40985.1	12400.00
21	31365.04	99.82	0.873	0.30(0.30)	0.99	42298.0	11111.00
22	30922.92	105.91	0.851	0.30(0.30)	0.99	44386.6	12201.00
23	30193.52	113.18	0.825	0.30(0.30)	0.99	46279.2	12231.00
24	29895.22	116.15	0.814	0.30(0.30)	0.99	46970.3	12101.10
25	29412.04	120.43	0.799	0.30(0.30)	0.99	47833.2	10400.00
26	29042.97	123.08	0.793	0.30(0.30)	0.99	48287.6	10200.00
27	28131.54	129.47	0.779	0.30(0.30)	0.99	49278.4	12010.00
28	27255.78	134.58	0.768	0.30(0.30)	0.99	49542.0	10210.00
29	26717.11	138.39	0.760	0.30(0.30)	0.99	49687.1	12000.00

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    30    23672.10  163.68    0.705  0.30( 0.30) 0.99   50301.7   10100.00
   TOTAL AREA(ACRES) =     50301.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    32052.44  Tc(MIN.) =   81.909
  EFFECTIVE AREA(ACRES) =  33797.41  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    50301.7
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.60 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    302.00  DOWNSTREAM(FEET) =    295.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   738.76   CHANNEL SLOPE =  0.0095
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.83
  CHANNEL FLOW THRU SUBAREA(CFS) =   32052.44
  FLOW VELOCITY(FEET/SEC.) =  17.12   FLOW DEPTH(FEET) =   7.83
  TRAVEL TIME(MIN.) =   0.72   Tc(MIN.) =   82.63
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.60 =  103401.57 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20137.52   18.92    2.128  0.30( 0.30) 0.99    5405.4   40430.00
      2    20154.85   19.03    2.119  0.30( 0.30) 0.99    5434.7   31700.00
      3    20240.30   19.45    2.082  0.30( 0.30) 0.99    5567.5   40440.00
      4    20477.46   20.66    2.000  0.30( 0.30) 0.99    5939.5   40400.00
      5    20511.43   20.83    1.991  0.30( 0.30) 0.99    5993.7   40420.00
      6    20521.17   20.88    1.989  0.30( 0.30) 0.99    6008.4   40410.00
      7    20588.91   21.23    1.971  0.30( 0.30) 0.99    6112.0   31800.00
      8    20638.83   21.48    1.957  0.30( 0.30) 0.99    6195.8   40300.00
      9    20846.09   22.59    1.899  0.30( 0.30) 0.99    6558.7   31710.00
     10    20902.17   22.89    1.883  0.30( 0.30) 0.99    6655.3   40200.00
     11    21185.16   24.71    1.787  0.30( 0.30) 0.99    7309.1   31810.00
     12    23294.13   37.42    1.405  0.30( 0.30) 0.99   11834.5   40100.00
     13    25374.40   47.16    1.244  0.30( 0.30) 0.99   15137.2   11801.00
     14    27845.29   58.44    1.096  0.30( 0.30) 0.99   19664.6   11530.00
     15    29229.49   67.36    1.036  0.30( 0.30) 0.99   24295.9   11910.00
     16    31403.61   77.80    0.977  0.30( 0.30) 0.99   30624.3   11350.00
     17    32052.44   82.63    0.950  0.30( 0.30) 0.99   33797.4   11130.00
     18    31962.63   88.66    0.916  0.30( 0.30) 0.99   36724.6   12300.00
     19    31894.70   92.53    0.900  0.30( 0.30) 0.99   38786.6   11620.00
     20    31612.13   97.32    0.882  0.30( 0.30) 0.99   40985.1   12400.00
     21    31365.04  100.54    0.871  0.30( 0.30) 0.99   42298.0   11111.00
     22    30922.92  106.64    0.849  0.30( 0.30) 0.99   44386.6   12201.00
     23    30193.52  113.91    0.822  0.30( 0.30) 0.99   46279.2   12231.00
     24    29895.22  116.88    0.811  0.30( 0.30) 0.99   46970.3   12101.10
     25    29412.04  121.17    0.797  0.30( 0.30) 0.99   47833.2   10400.00
     26    29042.97  123.82    0.792  0.30( 0.30) 0.99   48287.6   10200.00
     27    28131.54  130.22    0.778  0.30( 0.30) 0.99   49278.4   12010.00
     28    27255.78  135.34    0.767  0.30( 0.30) 0.99   49542.0   10210.00
     29    26717.11  139.15    0.758  0.30( 0.30) 0.99   49687.1   12000.00
```



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    30    23672.10  164.48    0.704  0.30( 0.30) 0.99   50301.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   32052.44  Tc(MIN.) =   82.63
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   33797.41

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610405W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      160.50   14.05  0.30( 0.30) 1.00      77.0   40510.00
      2      155.23   15.56  0.30( 0.30) 1.00      81.4   40500.00
    TOTAL AREA(ACRES) =       81.4

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20137.52   18.92    2.128  0.30( 0.30) 0.99    5405.4   40430.00
      2    20154.85   19.03    2.119  0.30( 0.30) 0.99    5434.7   31700.00
      3    20240.30   19.45    2.082  0.30( 0.30) 0.99    5567.5   40440.00
      4    20477.46   20.66    2.000  0.30( 0.30) 0.99    5939.5   40400.00
      5    20511.43   20.83    1.991  0.30( 0.30) 0.99    5993.7   40420.00
      6    20521.17   20.88    1.989  0.30( 0.30) 0.99    6008.4   40410.00
      7    20588.91   21.23    1.971  0.30( 0.30) 0.99    6112.0   31800.00
      8    20638.83   21.48    1.957  0.30( 0.30) 0.99    6195.8   40300.00
      9    20846.09   22.59    1.899  0.30( 0.30) 0.99    6558.7   31710.00
     10    20902.17   22.89    1.883  0.30( 0.30) 0.99    6655.3   40200.00
     11    21185.16   24.71    1.787  0.30( 0.30) 0.99    7309.1   31810.00
     12    23294.13   37.42    1.405  0.30( 0.30) 0.99   11834.5   40100.00
     13    25374.40   47.16    1.244  0.30( 0.30) 0.99   15137.2   11801.00
     14    27845.29   58.44    1.096  0.30( 0.30) 0.99   19664.6   11530.00
     15    29229.49   67.36    1.036  0.30( 0.30) 0.99   24295.9   11910.00
     16    31403.61   77.80    0.977  0.30( 0.30) 0.99   30624.3   11350.00
     17    32052.44   82.63    0.950  0.30( 0.30) 0.99   33797.4   11130.00
     18    31962.63   88.66    0.916  0.30( 0.30) 0.99   36724.6   12300.00
     19    31894.70   92.53    0.900  0.30( 0.30) 0.99   38786.6   11620.00
     20    31612.13   97.32    0.882  0.30( 0.30) 0.99   40985.1   12400.00
     21    31365.04  100.54    0.871  0.30( 0.30) 0.99   42298.0   11111.00
     22    30922.92  106.64    0.849  0.30( 0.30) 0.99   44386.6   12201.00
     23    30193.52  113.91    0.822  0.30( 0.30) 0.99   46279.2   12231.00
     24    29895.22  116.88    0.811  0.30( 0.30) 0.99   46970.3   12101.10
```

25	29412.04	121.17	0.797	0.30(0.30)	0.99	47833.2	10400.00
26	29042.97	123.82	0.792	0.30(0.30)	0.99	48287.6	10200.00
27	28131.54	130.22	0.778	0.30(0.30)	0.99	49278.4	12010.00
28	27255.78	135.34	0.767	0.30(0.30)	0.99	49542.0	10210.00
29	26717.11	139.15	0.758	0.30(0.30)	0.99	49687.1	12000.00
30	23672.10	164.48	0.704	0.30(0.30)	0.99	50301.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	160.50	14.05	2.615	0.30(0.30)	1.00	77.0	40510.00
2	155.23	15.56	2.419	0.30(0.30)	1.00	81.4	40500.00

LONGEST FLOWPATH FROM NODE 40500.00 TO NODE 12605.60 = 4091.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19088.12	14.05	2.615	0.30(0.30)	0.99	4090.3	40510.00
2	19349.60	15.56	2.419	0.30(0.30)	0.99	4526.8	40500.00
3	20271.43	18.92	2.128	0.30(0.30)	0.99	5486.8	40430.00
4	20288.11	19.03	2.119	0.30(0.30)	0.99	5516.1	31700.00
5	20370.85	19.45	2.082	0.30(0.30)	0.99	5648.8	40440.00
6	20602.02	20.66	2.000	0.30(0.30)	0.99	6020.9	40400.00
7	20635.31	20.83	1.991	0.30(0.30)	0.99	6075.1	40420.00
8	20644.86	20.88	1.989	0.30(0.30)	0.99	6089.8	40410.00
9	20711.29	21.23	1.971	0.30(0.30)	0.99	6193.4	31800.00
10	20760.24	21.48	1.957	0.30(0.30)	0.99	6277.1	40300.00
11	20963.20	22.59	1.899	0.30(0.30)	0.99	6640.1	31710.00
12	21018.13	22.89	1.883	0.30(0.30)	0.99	6736.7	40200.00
13	21294.11	24.71	1.787	0.30(0.30)	0.99	7390.4	31810.00
14	23375.12	37.42	1.405	0.30(0.30)	0.99	11915.8	40100.00
15	25443.55	47.16	1.244	0.30(0.30)	0.99	15218.6	11801.00
16	27903.64	58.44	1.096	0.30(0.30)	0.99	19746.0	11530.00
17	29283.42	67.36	1.036	0.30(0.30)	0.99	24377.2	11910.00
18	31453.26	77.80	0.977	0.30(0.30)	0.99	30705.7	11350.00
19	32100.10	82.63	0.950	0.30(0.30)	0.99	33878.8	11130.00
20	32007.83	88.66	0.916	0.30(0.30)	0.99	36805.9	12300.00
21	31938.66	92.53	0.900	0.30(0.30)	0.99	38868.0	11620.00
22	31654.83	97.32	0.882	0.30(0.30)	0.99	41066.5	12400.00
23	31406.88	100.54	0.871	0.30(0.30)	0.99	42379.4	11111.00
24	30963.13	106.64	0.849	0.30(0.30)	0.99	44468.0	12201.00
25	30231.80	113.91	0.822	0.30(0.30)	0.99	46360.5	12231.00
26	29932.71	116.88	0.811	0.30(0.30)	0.99	47051.7	12101.10
27	29448.52	121.17	0.797	0.30(0.30)	0.99	47914.6	10400.00
28	29079.03	123.82	0.792	0.30(0.30)	0.99	48369.0	10200.00
29	28166.58	130.22	0.778	0.30(0.30)	0.99	49359.8	12010.00
30	27290.01	135.34	0.767	0.30(0.30)	0.99	49623.4	10210.00
31	26750.73	139.15	0.758	0.30(0.30)	0.99	49768.5	12000.00
32	23701.71	164.48	0.704	0.30(0.30)	0.99	50383.1	10100.00

TOTAL AREA(ACRES) = 50383.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 32100.10 Tc(MIN.) = 82.629
EFFECTIVE AREA(ACRES) = 33878.79 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50383.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

****

FLOW PROCESS FROM NODE 12605.60 TO NODE 12606.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 295.00 DOWNSTREAM(FEET) = 286.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1203.43 CHANNEL SLOPE = 0.0075
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.38
CHANNEL FLOW THRU SUBAREA(CFS) = 32100.10
FLOW VELOCITY(FEET/SEC.) = 15.83 FLOW DEPTH(FEET) = 8.38
TRAVEL TIME(MIN.) = 1.27 Tc(MIN.) = 83.90
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19088.12	15.56	2.419	0.30(0.30)	0.99	4090.3	40510.00
2	19349.60	17.07	2.289	0.30(0.30)	0.99	4526.8	40500.00
3	20271.43	20.40	2.014	0.30(0.30)	0.99	5486.8	40430.00
4	20288.11	20.51	2.008	0.30(0.30)	0.99	5516.1	31700.00
5	20370.85	20.93	1.986	0.30(0.30)	0.99	5648.8	40440.00
6	20602.02	22.13	1.923	0.30(0.30)	0.99	6020.9	40400.00
7	20635.31	22.30	1.914	0.30(0.30)	0.99	6075.1	40420.00
8	20644.86	22.35	1.911	0.30(0.30)	0.99	6089.8	40410.00
9	20711.29	22.69	1.893	0.30(0.30)	0.99	6193.4	31800.00
10	20760.24	22.94	1.880	0.30(0.30)	0.99	6277.1	40300.00
11	20963.20	24.05	1.822	0.30(0.30)	0.99	6640.1	31710.00
12	21018.13	24.35	1.806	0.30(0.30)	0.99	6736.7	40200.00
13	21294.11	26.16	1.721	0.30(0.30)	0.99	7390.4	31810.00
14	23375.12	38.83	1.377	0.30(0.30)	0.99	11915.8	40100.00
15	25443.55	48.53	1.223	0.30(0.30)	0.99	15218.6	11801.00
16	27903.64	59.77	1.080	0.30(0.30)	0.99	19746.0	11530.00
17	29283.42	68.67	1.028	0.30(0.30)	0.99	24377.2	11910.00
18	31453.26	79.07	0.970	0.30(0.30)	0.99	30705.7	11350.00
19	32100.10	83.90	0.943	0.30(0.30)	0.99	33878.8	11130.00
20	32007.83	89.93	0.909	0.30(0.30)	0.99	36805.9	12300.00
21	31938.66	93.80	0.895	0.30(0.30)	0.99	38868.0	11620.00
22	31654.83	98.60	0.878	0.30(0.30)	0.99	41066.5	12400.00
23	31406.88	101.82	0.866	0.30(0.30)	0.99	42379.4	11111.00
24	30963.13	107.92	0.844	0.30(0.30)	0.99	44468.0	12201.00
25	30231.80	115.20	0.817	0.30(0.30)	0.99	46360.5	12231.00
26	29932.71	118.18	0.807	0.30(0.30)	0.99	47051.7	12101.10
27	29448.52	122.47	0.795	0.30(0.30)	0.99	47914.6	10400.00
28	29079.03	125.13	0.789	0.30(0.30)	0.99	48369.0	10200.00
29	28166.58	131.54	0.775	0.30(0.30)	0.99	49359.8	12010.00
30	27290.01	136.67	0.764	0.30(0.30)	0.99	49623.4	10210.00
31	26750.73	140.50	0.756	0.30(0.30)	0.99	49768.5	12000.00
32	23701.71	165.88	0.701	0.30(0.30)	0.99	50383.1	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 32100.10 Tc(MIN.) = 83.90
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33878.79

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 FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610406W.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      206.23   20.73  0.30( 0.30) 0.99     135.0   40600.00
   TOTAL AREA(ACRES) =      135.0

****************************************************************************
 FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    19088.12   15.56    2.419  0.30( 0.30) 0.99    4090.3   40510.00
     2    19349.60   17.07    2.289  0.30( 0.30) 0.99    4526.8   40500.00
     3    20271.43   20.40    2.014  0.30( 0.30) 0.99    5486.8   40430.00
     4    20288.11   20.51    2.008  0.30( 0.30) 0.99    5516.1   31700.00
     5    20370.85   20.93    1.986  0.30( 0.30) 0.99    5648.8   40440.00
     6    20602.02   22.13    1.923  0.30( 0.30) 0.99    6020.9   40400.00
     7    20635.31   22.30    1.914  0.30( 0.30) 0.99    6075.1   40420.00
     8    20644.86   22.35    1.911  0.30( 0.30) 0.99    6089.8   40410.00
     9    20711.29   22.69    1.893  0.30( 0.30) 0.99    6193.4   31800.00
    10    20760.24   22.94    1.880  0.30( 0.30) 0.99    6277.1   40300.00
    11    20963.20   24.05    1.822  0.30( 0.30) 0.99    6640.1   31710.00
    12    21018.13   24.35    1.806  0.30( 0.30) 0.99    6736.7   40200.00
    13    21294.11   26.16    1.721  0.30( 0.30) 0.99    7390.4   31810.00
    14    23375.12   38.83    1.377  0.30( 0.30) 0.99   11915.8   40100.00
    15    25443.55   48.53    1.223  0.30( 0.30) 0.99   15218.6   11801.00
    16    27903.64   59.77    1.080  0.30( 0.30) 0.99   19746.0   11530.00
    17    29283.42   68.67    1.028  0.30( 0.30) 0.99   24377.2   11910.00
    18    31453.26   79.07    0.970  0.30( 0.30) 0.99   30705.7   11350.00
    19    32100.10   83.90    0.943  0.30( 0.30) 0.99   33878.8   11130.00
    20    32007.83   89.93    0.909  0.30( 0.30) 0.99   36805.9   12300.00
    21    31938.66   93.80    0.895  0.30( 0.30) 0.99   38868.0   11620.00
    22    31654.83   98.60    0.878  0.30( 0.30) 0.99   41066.5   12400.00
    23    31406.88  101.82    0.866  0.30( 0.30) 0.99   42379.4   11111.00
    24    30963.13  107.92    0.844  0.30( 0.30) 0.99   44468.0   12201.00
    25    30231.80  115.20    0.817  0.30( 0.30) 0.99   46360.5   12231.00
    26    29932.71  118.18    0.807  0.30( 0.30) 0.99   47051.7   12101.10
    27    29448.52  122.47    0.795  0.30( 0.30) 0.99   47914.6   10400.00
    28    29079.03  125.13    0.789  0.30( 0.30) 0.99   48369.0   10200.00
    29    28166.58  131.54    0.775  0.30( 0.30) 0.99   49359.8   12010.00
    30    27290.01  136.67    0.764  0.30( 0.30) 0.99   49623.4   10210.00
    31    26750.73  140.50    0.756  0.30( 0.30) 0.99   49768.5   12000.00
    32    23701.71  165.88    0.701  0.30( 0.30) 0.99   50383.1   10100.00
```



```
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      206.23   20.73    1.996  0.30( 0.30) 0.99     135.0   40600.00
 LONGEST FLOWPATH FROM NODE  40600.00 TO NODE  12606.00 =    6107.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    19281.46   15.56    2.419  0.30( 0.30) 0.99    4191.6   40510.00
     2    19548.61   17.07    2.289  0.30( 0.30) 0.99    4637.9   40500.00
     3    20476.46   20.40    2.014  0.30( 0.30) 0.99    5619.6   40430.00
     4    20493.52   20.51    2.008  0.30( 0.30) 0.99    5649.6   31700.00
     5    20538.75   20.73    1.996  0.30( 0.30) 0.99    5722.3   40600.00
     6    20575.82   20.93    1.986  0.30( 0.30) 0.99    5783.8   40440.00
     7    20799.34   22.13    1.923  0.30( 0.30) 0.99    6155.9   40400.00
     8    20831.51   22.30    1.914  0.30( 0.30) 0.99    6210.0   40420.00
     9    20840.76   22.35    1.911  0.30( 0.30) 0.99    6224.7   40410.00
    10    20905.00   22.69    1.893  0.30( 0.30) 0.99    6328.4   31800.00
    11    20952.36   22.94    1.880  0.30( 0.30) 0.99    6412.1   40300.00
    12    21148.23   24.05    1.822  0.30( 0.30) 0.99    6775.0   31710.00
    13    21201.26   24.35    1.806  0.30( 0.30) 0.99    6871.7   40200.00
    14    21466.90   26.16    1.721  0.30( 0.30) 0.99    7525.4   31810.00
    15    23506.17   38.83    1.377  0.30( 0.30) 0.99   12050.8   40100.00
    16    25555.80   48.53    1.223  0.30( 0.30) 0.99   15353.6   11801.00
    17    27998.56   59.77    1.080  0.30( 0.30) 0.99   19881.0   11530.00
    18    29372.09   68.67    1.028  0.30( 0.30) 0.99   24512.2   11910.00
    19    31534.85   79.07    0.970  0.30( 0.30) 0.99   30840.6   11350.00
    20    32178.42   83.90    0.943  0.30( 0.30) 0.99   34013.8   11130.00
    21    32082.04   89.93    0.909  0.30( 0.30) 0.99   36940.9   12300.00
    22    32011.15   93.80    0.895  0.30( 0.30) 0.99   39003.0   11620.00
    23    31725.20   98.60    0.878  0.30( 0.30) 0.99   41201.5   12400.00
    24    31475.83  101.82    0.866  0.30( 0.30) 0.99   42514.3   11111.00
    25    31029.39  107.92    0.844  0.30( 0.30) 0.99   44602.9   12201.00
    26    30294.85  115.20    0.817  0.30( 0.30) 0.99   46495.5   12231.00
    27    29994.44  118.18    0.807  0.30( 0.30) 0.99   47186.7   12101.10
    28    29508.79  122.47    0.795  0.30( 0.30) 0.99   48049.6   10400.00
    29    29138.60  125.13    0.789  0.30( 0.30) 0.99   48503.9   10200.00
    30    28224.47  131.54    0.775  0.30( 0.30) 0.99   49494.8   12010.00
    31    27346.55  136.67    0.764  0.30( 0.30) 0.99   49758.4   10210.00
    32    26806.26  140.50    0.756  0.30( 0.30) 0.99   49903.5   12000.00
    33    23750.56  165.88    0.701  0.30( 0.30) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =     50518.0

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    32178.42  Tc(MIN.) =   83.896
 EFFECTIVE AREA(ACRES) =  34013.76  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    50518.0
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    50518.0  TC(MIN.) =     83.90
 EFFECTIVE AREA(ACRES) =  34013.76  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.994
 PEAK FLOW RATE(CFS)   =   32178.42
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19281.46	15.56	2.419	0.30(0.30)	0.99	4191.6	40510.00
2	19548.61	17.07	2.289	0.30(0.30)	0.99	4637.9	40500.00
3	20476.46	20.40	2.014	0.30(0.30)	0.99	5619.6	40430.00
4	20493.52	20.51	2.008	0.30(0.30)	0.99	5649.6	31700.00
5	20538.75	20.73	1.996	0.30(0.30)	0.99	5722.3	40600.00
6	20575.82	20.93	1.986	0.30(0.30)	0.99	5783.8	40440.00
7	20799.34	22.13	1.923	0.30(0.30)	0.99	6155.9	40400.00
8	20831.51	22.30	1.914	0.30(0.30)	0.99	6210.0	40420.00
9	20840.76	22.35	1.911	0.30(0.30)	0.99	6224.7	40410.00
10	20905.00	22.69	1.893	0.30(0.30)	0.99	6328.4	31800.00
11	20952.36	22.94	1.880	0.30(0.30)	0.99	6412.1	40300.00
12	21148.23	24.05	1.822	0.30(0.30)	0.99	6775.0	31710.00
13	21201.26	24.35	1.806	0.30(0.30)	0.99	6871.7	40200.00
14	21466.90	26.16	1.721	0.30(0.30)	0.99	7525.4	31810.00
15	23506.17	38.83	1.377	0.30(0.30)	0.99	12050.8	40100.00
16	25555.80	48.53	1.223	0.30(0.30)	0.99	15353.6	11801.00
17	27998.56	59.77	1.080	0.30(0.30)	0.99	19881.0	11530.00
18	29372.09	68.67	1.028	0.30(0.30)	0.99	24512.2	11910.00
19	31534.85	79.07	0.970	0.30(0.30)	0.99	30840.6	11350.00
20	32178.42	83.90	0.943	0.30(0.30)	0.99	34013.8	11130.00
21	32082.04	89.93	0.909	0.30(0.30)	0.99	36940.9	12300.00
22	32011.15	93.80	0.895	0.30(0.30)	0.99	39003.0	11620.00
23	31725.20	98.60	0.878	0.30(0.30)	0.99	41201.5	12400.00
24	31475.83	101.82	0.866	0.30(0.30)	0.99	42514.3	11111.00
25	31029.39	107.92	0.844	0.30(0.30)	0.99	44602.9	12201.00
26	30294.85	115.20	0.817	0.30(0.30)	0.99	46495.5	12231.00
27	29994.44	118.18	0.807	0.30(0.30)	0.99	47186.7	12101.10
28	29508.79	122.47	0.795	0.30(0.30)	0.99	48049.6	10400.00
29	29138.60	125.13	0.789	0.30(0.30)	0.99	48503.9	10200.00
30	28224.47	131.54	0.775	0.30(0.30)	0.99	49494.8	12010.00
31	27346.55	136.67	0.764	0.30(0.30)	0.99	49758.4	10210.00
32	26806.26	140.50	0.756	0.30(0.30)	0.99	49903.5	12000.00
33	23750.56	165.88	0.701	0.30(0.30)	0.99	50518.0	10100.00

END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:
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  FILE NAME: S27.DAT
  TIME/DATE OF STUDY: 09:27 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.939
   2)   10.00;  3.217
   3)   15.00;  2.453
   4)   20.00;  2.025
   5)   25.00;  1.764
   6)   30.00;  1.547
   7)   40.00;  1.348
   8)   50.00;  1.195
   9)   60.00;  1.071
  10)   90.00;  0.902
  11)  120.00;  0.793
  12)  180.00;  0.663
  13)  360.00;  0.491
  14) 1200.00;  0.216
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S26.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    19548.61   17.07  0.30( 0.30) 0.99    4637.9   40500.00
      2    20575.82   20.93  0.30( 0.30) 0.99    5783.8   40440.00
      3    21466.90   26.16  0.30( 0.30) 0.99    7525.4   31810.00
      4    23506.17   38.83  0.30( 0.30) 0.99   12050.8   40100.00
      5    25555.80   48.53  0.30( 0.30) 0.99   15353.6   11801.00
      6    27998.56   59.77  0.30( 0.30) 0.99   19881.0   11530.00
      7    29372.09   68.67  0.30( 0.30) 0.99   24512.2   11910.00
      8    31534.85   79.07  0.30( 0.30) 0.99   30840.6   11350.00
      9    32178.42   83.90  0.30( 0.30) 0.99   34013.8   11130.00
     10    32082.04   89.93  0.30( 0.30) 0.99   36940.9   12300.00
     11    32011.15   93.80  0.30( 0.30) 0.99   39003.0   11620.00
     12    31725.20   98.60  0.30( 0.30) 0.99   41201.5   12400.00
     13    31475.83  101.82  0.30( 0.30) 0.99   42514.3   11111.00
     14    31029.39  107.92  0.30( 0.30) 0.99   44602.9   12201.00
     15    30294.85  115.20  0.30( 0.30) 0.99   46495.5   12231.00
     16    29508.79  122.47  0.30( 0.30) 0.99   48049.6   10400.00
     17    28224.47  131.54  0.30( 0.30) 0.99   49494.8   12010.00
     18    27346.55  136.67  0.30( 0.30) 0.99   49758.4   10210.00
     19    26806.26  140.50  0.30( 0.30) 0.99   49903.5   12000.00
     20    23750.56  165.88  0.30( 0.30) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =    50518.0

**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    19548.61   17.07  0.30( 0.30) 0.99    4637.9   40500.00
      2    20575.82   20.93  0.30( 0.30) 0.99    5783.8   40440.00
      3    21466.90   26.16  0.30( 0.30) 0.99    7525.4   31810.00
      4    23506.17   38.83  0.30( 0.30) 0.99   12050.8   40100.00
      5    25555.80   48.53  0.30( 0.30) 0.99   15353.6   11801.00
      6    27998.56   59.77  0.30( 0.30) 0.99   19881.0   11530.00
      7    29372.09   68.67  0.30( 0.30) 0.99   24512.2   11910.00
      8    31534.85   79.07  0.30( 0.30) 0.99   30840.6   11350.00
      9    32178.42   83.90  0.30( 0.30) 0.99   34013.8   11130.00
     10    32082.04   89.93  0.30( 0.30) 0.99   36940.9   12300.00
     11    32011.15   93.80  0.30( 0.30) 0.99   39003.0   11620.00
     12    31725.20   98.60  0.30( 0.30) 0.99   41201.5   12400.00
     13    31475.83  101.82  0.30( 0.30) 0.99   42514.3   11111.00
     14    31029.39  107.92  0.30( 0.30) 0.99   44602.9   12201.00
     15    30294.85  115.20  0.30( 0.30) 0.99   46495.5   12231.00
     16    29508.79  122.47  0.30( 0.30) 0.99   48049.6   10400.00
     17    28224.47  131.54  0.30( 0.30) 0.99   49494.8   12010.00
     18    27346.55  136.67  0.30( 0.30) 0.99   49758.4   10210.00
```

```
    19    26806.26  140.50  0.30( 0.30) 0.99   49903.5   12000.00
    20    23750.56  165.88  0.30( 0.30) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =     50518.0

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12701.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    286.00  DOWNSTREAM(FEET) =    276.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.19   CHANNEL SLOPE =  0.0079
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.929
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.55      0.30     0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   32180.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.16
  AVERAGE FLOW DEPTH(FEET) =   8.25   TRAVEL TIME(MIN.) =   1.30
  Tc(MIN.) =   85.20
  SUBAREA AREA(ACRES) =     7.55       SUBAREA RUNOFF(CFS) =    4.50
  EFFECTIVE AREA(ACRES) =  34021.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50525.6         PEAK FLOW RATE(CFS) =   32178.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.25   FLOW VELOCITY(FEET/SEC.) =  16.16
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12701.00 =  105865.19 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19548.61   18.60    2.144  0.30( 0.30) 0.99    4645.5   40500.00
      2    20575.82   22.44    1.897  0.30( 0.30) 0.99    5791.4   40440.00
      3    21466.90   27.65    1.649  0.30( 0.30) 0.99    7533.0   31810.00
      4    23506.17   40.27    1.344  0.30( 0.30) 0.99   12058.4   40100.00
      5    25555.80   49.94    1.196  0.30( 0.30) 0.99   15361.1   11801.00
      6    27998.56   61.13    1.065  0.30( 0.30) 0.99   19888.5   11530.00
      7    29372.09   70.01    1.015  0.30( 0.30) 0.99   24519.8   11910.00
      8    31534.85   80.38    0.956  0.30( 0.30) 0.99   30848.2   11350.00
      9    32178.42   85.20    0.929  0.30( 0.30) 0.99   34021.3   11130.00
     10    32082.04   91.23    0.898  0.30( 0.30) 0.99   36948.5   12300.00
     11    32011.15   95.10    0.883  0.30( 0.30) 0.99   39010.5   11620.00
     12    31725.20   99.90    0.866  0.30( 0.30) 0.99   41209.0   12400.00
     13    31475.83  103.13    0.854  0.30( 0.30) 0.99   42521.9   11111.00
     14    31029.39  109.24    0.832  0.30( 0.30) 0.99   44610.5   12201.00
     15    30294.85  116.53    0.806  0.30( 0.30) 0.99   46503.1   12231.00
     16    29508.79  123.81    0.785  0.30( 0.30) 0.99   48057.1   10400.00
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     17    28224.47  132.90    0.765  0.30( 0.30) 0.99   49502.3   12010.00
     18    27346.55  138.04    0.754  0.30( 0.30) 0.99   49765.9   10210.00
     19    26806.26  141.88    0.746  0.30( 0.30) 0.99   49911.0   12000.00
     20    23750.56  167.32    0.690  0.30( 0.30) 0.99   50525.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   32178.42  Tc(MIN.) =   85.20
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34021.31

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    276.00  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   147.65   CHANNEL SLOPE =  0.0068
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.63
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.928
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        1.49      0.30     0.972     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.972
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   32178.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.33
  AVERAGE FLOW DEPTH(FEET) =   8.63   TRAVEL TIME(MIN.) =   0.16
  Tc(MIN.) =   85.36
  SUBAREA AREA(ACRES) =     1.49       SUBAREA RUNOFF(CFS) =    0.85
  EFFECTIVE AREA(ACRES) =  34022.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50527.1         PEAK FLOW RATE(CFS) =   32178.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.63   FLOW VELOCITY(FEET/SEC.) =  15.33
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19548.61   18.79    2.128  0.30( 0.30) 0.99    4647.0   40500.00
      2    20575.82   22.63    1.888  0.30( 0.30) 0.99    5792.9   40440.00
      3    21466.90   27.84    1.641  0.30( 0.30) 0.99    7534.4   31810.00
      4    23506.17   40.45    1.341  0.30( 0.30) 0.99   12059.8   40100.00
      5    25555.80   50.11    1.194  0.30( 0.30) 0.99   15362.6   11801.00
      6    27998.56   61.30    1.064  0.30( 0.30) 0.99   19890.0   11530.00
      7    29372.09   70.17    1.014  0.30( 0.30) 0.99   24521.3   11910.00
      8    31534.85   80.54    0.955  0.30( 0.30) 0.99   30849.7   11350.00
      9    32178.42   85.36    0.928  0.30( 0.30) 0.99   34022.8   11130.00
     10    32082.04   91.39    0.897  0.30( 0.30) 0.99   36949.9   12300.00
     11    32011.15   95.27    0.883  0.30( 0.30) 0.99   39012.0   11620.00
```

```
    12    31725.20  100.06    0.865  0.30( 0.30) 0.99   41210.5   12400.00
    13    31475.83  103.29    0.854  0.30( 0.30) 0.99   42523.4   11111.00
    14    31029.39  109.40    0.832  0.30( 0.30) 0.99   44612.0   12201.00
    15    30294.85  116.69    0.805  0.30( 0.30) 0.99   46504.6   12231.00
    16    29508.79  123.98    0.784  0.30( 0.30) 0.99   48058.6   10400.00
    17    28224.47  133.07    0.765  0.30( 0.30) 0.99   49503.8   12010.00
    18    27346.55  138.21    0.754  0.30( 0.30) 0.99   49767.4   10210.00
    19    26806.26  142.05    0.745  0.30( 0.30) 0.99   49912.5   12000.00
    20    23750.56  167.50    0.690  0.30( 0.30) 0.99   50527.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   32178.42  Tc(MIN.) =   85.36
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34022.80

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   85.36
  RAINFALL INTENSITY(INCH/HR) =   0.93
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =   34022.80
  TOTAL STREAM AREA(ACRES) =   50527.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   32178.42

****************************************************************************
  FLOW PROCESS FROM NODE  12710.00 TO NODE  12711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.56
  ELEVATION DATA: UPSTREAM(FEET) =    940.78  DOWNSTREAM(FEET) =    657.79

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.910
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.620
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.56      0.30     1.000     0   13.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.70
  TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =     13.70

****************************************************************************
  FLOW PROCESS FROM NODE  12711.00 TO NODE  12712.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    657.79  DOWNSTREAM(FEET) =    585.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =   766.00   CHANNEL SLOPE =  0.0942
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.337
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.94      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.22
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =   16.35
  SUBAREA AREA(ACRES) =    26.94       SUBAREA RUNOFF(CFS) =   49.40
  EFFECTIVE AREA(ACRES) =     33.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.5         PEAK FLOW RATE(CFS) =      61.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   6.12
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12712.00 =    1709.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12712.00 TO NODE  12713.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.63  DOWNSTREAM(FEET) =    463.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.79   CHANNEL SLOPE =  0.1188
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.129
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      73.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.04
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   18.78
  SUBAREA AREA(ACRES) =    14.73       SUBAREA RUNOFF(CFS) =   24.25
  EFFECTIVE AREA(ACRES) =     48.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       48.2         PEAK FLOW RATE(CFS) =      79.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   7.22
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12713.00 =    2735.35 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12713.00 TO NODE  12714.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    463.75  DOWNSTREAM(FEET) =    360.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1148.54   CHANNEL SLOPE =  0.0901
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.53
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.967
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     158.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.20
  AVERAGE FLOW DEPTH(FEET) =   1.49   TRAVEL TIME(MIN.) =   2.33
  Tc(MIN.) =   21.12
  SUBAREA AREA(ACRES) =   105.64       SUBAREA RUNOFF(CFS) =  158.47
  EFFECTIVE AREA(ACRES) =    153.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      153.9         PEAK FLOW RATE(CFS) =     230.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =   9.21
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12714.00 =    3883.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    360.30  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1314.99   CHANNEL SLOPE =  0.0649
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.42
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.840
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     318.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.02
```



```
  AVERAGE FLOW DEPTH(FEET) =   2.39   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   23.55
  SUBAREA AREA(ACRES) =   127.13       SUBAREA RUNOFF(CFS) =  176.19
  EFFECTIVE AREA(ACRES) =    281.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.0         PEAK FLOW RATE(CFS) =     389.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.66   FLOW VELOCITY(FEET/SEC.) =   9.56
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12720.00 =    5198.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.55
  RAINFALL INTENSITY(INCH/HR) =   1.84
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     281.00
  TOTAL STREAM AREA(ACRES) =     281.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     389.44

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1    19548.61   18.79    2.128  0.30( 0.30) 0.99    4647.0   40500.00
      1    20575.82   22.63    1.888  0.30( 0.30) 0.99    5792.9   40440.00
      1    21466.90   27.84    1.641  0.30( 0.30) 0.99    7534.4   31810.00
      1    23506.17   40.45    1.341  0.30( 0.30) 0.99   12059.8   40100.00
      1    25555.80   50.11    1.194  0.30( 0.30) 0.99   15362.6   11801.00
      1    27998.56   61.30    1.064  0.30( 0.30) 0.99   19890.0   11530.00
      1    29372.09   70.17    1.014  0.30( 0.30) 0.99   24521.3   11910.00
      1    31534.85   80.54    0.955  0.30( 0.30) 0.99   30849.7   11350.00
      1    32178.42   85.36    0.928  0.30( 0.30) 0.99   34022.8   11130.00
      1    32082.04   91.39    0.897  0.30( 0.30) 0.99   36949.9   12300.00
      1    32011.15   95.27    0.883  0.30( 0.30) 0.99   39012.0   11620.00
      1    31725.20  100.06    0.865  0.30( 0.30) 0.99   41210.5   12400.00
      1    31475.83  103.29    0.854  0.30( 0.30) 0.99   42523.4   11111.00
      1    31029.39  109.40    0.832  0.30( 0.30) 0.99   44612.0   12201.00
      1    30294.85  116.69    0.805  0.30( 0.30) 0.99   46504.6   12231.00
      1    29508.79  123.98    0.784  0.30( 0.30) 0.99   48058.6   10400.00
      1    28224.47  133.07    0.765  0.30( 0.30) 0.99   49503.8   12010.00
      1    27346.55  138.21    0.754  0.30( 0.30) 0.99   49767.4   10210.00
      1    26806.26  142.05    0.745  0.30( 0.30) 0.99   49912.5   12000.00
      1    23750.56  167.50    0.690  0.30( 0.30) 0.99   50527.1   10100.00
      2      389.44   23.55    1.840  0.30( 0.30) 1.00     281.0   12710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19917.65	18.79	2.128	0.30(0.30)	0.99	4871.3	40500.00
2	20961.73	22.63	1.888	0.30(0.30)	0.99	6062.9	40440.00
3	21122.19	23.55	1.840	0.30(0.30)	0.99	6380.6	12710.00
4	21806.02	27.84	1.641	0.30(0.30)	0.99	7815.4	31810.00
5	23769.49	40.45	1.341	0.30(0.30)	0.99	12340.8	40100.00
6	25781.82	50.11	1.194	0.30(0.30)	0.99	15643.6	11801.00
7	28191.72	61.30	1.064	0.30(0.30)	0.99	20171.0	11530.00
8	29552.60	70.17	1.014	0.30(0.30)	0.99	24802.3	11910.00
9	31700.59	80.54	0.955	0.30(0.30)	0.99	31130.7	11350.00
10	32337.30	85.36	0.928	0.30(0.30)	0.99	34303.8	11130.00
11	32233.02	91.39	0.897	0.30(0.30)	0.99	37230.9	12300.00
12	32158.58	95.27	0.883	0.30(0.30)	0.99	39293.0	11620.00
13	31868.22	100.06	0.865	0.30(0.30)	0.99	41491.5	12400.00
14	31615.88	103.29	0.854	0.30(0.30)	0.99	42804.4	11111.00
15	31163.83	109.40	0.832	0.30(0.30)	0.99	44893.0	12201.00
16	30422.58	116.69	0.805	0.30(0.30)	0.99	46785.6	12231.00
17	29631.31	123.98	0.784	0.30(0.30)	0.99	48339.6	10400.00
18	28342.00	133.07	0.765	0.30(0.30)	0.99	49784.8	12010.00
19	27461.26	138.21	0.754	0.30(0.30)	0.99	50048.4	10210.00
20	26918.87	142.05	0.745	0.30(0.30)	0.99	50193.5	12000.00
21	23849.23	167.50	0.690	0.30(0.30)	0.99	50808.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 32337.30 Tc(MIN.) = 85.36
EFFECTIVE AREA(ACRES) = 34303.80 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50808.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========
MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610316W.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	298.19	25.92	0.30(0.30)	0.98	231.4	31600.00

TOTAL AREA(ACRES) = 231.4

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19917.65	18.79	2.128	0.30(0.30)	0.99	4871.3	40500.00
2	20961.73	22.63	1.888	0.30(0.30)	0.99	6062.9	40440.00
3	21122.19	23.55	1.840	0.30(0.30)	0.99	6380.6	12710.00
4	21806.02	27.84	1.641	0.30(0.30)	0.99	7815.4	31810.00
5	23769.49	40.45	1.341	0.30(0.30)	0.99	12340.8	40100.00
6	25781.82	50.11	1.194	0.30(0.30)	0.99	15643.6	11801.00
7	28191.72	61.30	1.064	0.30(0.30)	0.99	20171.0	11530.00
8	29552.60	70.17	1.014	0.30(0.30)	0.99	24802.3	11910.00
9	31700.59	80.54	0.955	0.30(0.30)	0.99	31130.7	11350.00
10	32337.30	85.36	0.928	0.30(0.30)	0.99	34303.8	11130.00
11	32233.02	91.39	0.897	0.30(0.30)	0.99	37230.9	12300.00
12	32158.58	95.27	0.883	0.30(0.30)	0.99	39293.0	11620.00
13	31868.22	100.06	0.865	0.30(0.30)	0.99	41491.5	12400.00
14	31615.88	103.29	0.854	0.30(0.30)	0.99	42804.4	11111.00
15	31163.83	109.40	0.832	0.30(0.30)	0.99	44893.0	12201.00
16	30422.58	116.69	0.805	0.30(0.30)	0.99	46785.6	12231.00
17	29631.31	123.98	0.784	0.30(0.30)	0.99	48339.6	10400.00
18	28342.00	133.07	0.765	0.30(0.30)	0.99	49784.8	12010.00
19	27461.26	138.21	0.754	0.30(0.30)	0.99	50048.4	10210.00
20	26918.87	142.05	0.745	0.30(0.30)	0.99	50193.5	12000.00
21	23849.23	167.50	0.690	0.30(0.30)	0.99	50808.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	298.19	25.92	1.724	0.30(0.30)	0.98	231.4	31600.00

LONGEST FLOWPATH FROM NODE 31600.00 TO NODE 12720.00 = 7759.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20195.00	18.79	2.128	0.30(0.30)	0.99	5039.0	40500.00
2	21251.87	22.63	1.888	0.30(0.30)	0.99	6264.9	40440.00
3	21415.02	23.55	1.840	0.30(0.30)	0.99	6590.8	12710.00
4	21799.24	25.92	1.724	0.30(0.30)	0.99	7406.9	31600.00
5	22086.88	27.84	1.641	0.30(0.30)	0.99	8046.8	31810.00
6	23987.79	40.45	1.341	0.30(0.30)	0.99	12572.2	40100.00
7	25969.34	50.11	1.194	0.30(0.30)	0.99	15875.0	11801.00
8	28352.12	61.30	1.064	0.30(0.30)	0.99	20402.4	11530.00
9	29702.56	70.17	1.014	0.30(0.30)	0.99	25033.7	11910.00
10	31838.35	80.54	0.955	0.30(0.30)	0.99	31362.1	11350.00
11	32469.41	85.36	0.928	0.30(0.30)	0.99	34535.2	11130.00
12	32358.62	91.39	0.897	0.30(0.30)	0.99	37462.3	12300.00
13	32281.23	95.27	0.883	0.30(0.30)	0.99	39524.4	11620.00
14	31987.24	100.06	0.865	0.30(0.30)	0.99	41722.9	12400.00
15	31732.46	103.29	0.854	0.30(0.30)	0.99	43035.8	11111.00
16	31275.77	109.40	0.832	0.30(0.30)	0.99	45124.4	12201.00
17	30528.99	116.69	0.805	0.30(0.30)	0.99	47016.9	12231.00
18	29733.42	123.98	0.784	0.30(0.30)	0.99	48571.0	10400.00
19	28440.00	133.07	0.765	0.30(0.30)	0.99	50016.2	12010.00
20	27556.93	138.21	0.754	0.30(0.30)	0.99	50279.8	10210.00
21	27012.80	142.05	0.745	0.30(0.30)	0.99	50424.9	12000.00
22	23931.65	167.50	0.690	0.30(0.30)	0.99	51039.5	10100.00

TOTAL AREA(ACRES) = 51039.5

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    32469.41  Tc(MIN.) =   85.356
  EFFECTIVE AREA(ACRES) =  34535.19  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51039.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    275.00  DOWNSTREAM(FEET) =    258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2669.21   CHANNEL SLOPE =  0.0064
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.83
  CHANNEL FLOW THRU SUBAREA(CFS) =   32469.41
  FLOW VELOCITY(FEET/SEC.) =  15.06   FLOW DEPTH(FEET) =   8.83
  TRAVEL TIME(MIN.) =   2.95   Tc(MIN.) =   88.31
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20195.00   22.26    1.907  0.30( 0.30) 0.99    5039.0   40500.00
      2    21251.87   26.04    1.719  0.30( 0.30) 0.99    6264.9   40440.00
      3    21415.02   26.94    1.680  0.30( 0.30) 0.99    6590.8   12710.00
      4    21799.24   29.30    1.577  0.30( 0.30) 0.99    7406.9   31600.00
      5    22086.88   31.20    1.523  0.30( 0.30) 0.99    8046.8   31810.00
      6    23987.79   43.72    1.291  0.30( 0.30) 0.99   12572.2   40100.00
      7    25969.34   53.29    1.154  0.30( 0.30) 0.99   15875.0   11801.00
      8    28352.12   64.39    1.046  0.30( 0.30) 0.99   20402.4   11530.00
      9    29702.56   73.22    0.997  0.30( 0.30) 0.99   25033.7   11910.00
     10    31838.35   83.52    0.939  0.30( 0.30) 0.99   31362.1   11350.00
     11    32469.41   88.31    0.912  0.30( 0.30) 0.99   34535.2   11130.00
     12    32358.62   94.35    0.886  0.30( 0.30) 0.99   37462.3   12300.00
     13    32281.23   98.22    0.872  0.30( 0.30) 0.99   39524.4   11620.00
     14    31987.24  103.03    0.855  0.30( 0.30) 0.99   41722.9   12400.00
     15    31732.46  106.27    0.843  0.30( 0.30) 0.99   43035.8   11111.00
     16    31275.77  112.39    0.821  0.30( 0.30) 0.99   45124.4   12201.00
     17    30528.99  119.71    0.794  0.30( 0.30) 0.99   47016.9   12231.00
     18    29733.42  127.02    0.778  0.30( 0.30) 0.99   48571.0   10400.00
     19    28440.00  136.15    0.758  0.30( 0.30) 0.99   50016.2   12010.00
     20    27556.93  141.33    0.747  0.30( 0.30) 0.99   50279.8   10210.00
     21    27012.80  145.19    0.738  0.30( 0.30) 0.99   50424.9   12000.00
     22    23931.65  170.77    0.683  0.30( 0.30) 0.99   51039.5   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   32469.41  Tc(MIN.) =   88.31
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34535.19

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
```



```
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610315W.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       95.39   24.29  0.30( 0.25) 0.83      68.1   31500.00
    TOTAL AREA(ACRES) =       68.1

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20195.00   22.26    1.907  0.30( 0.30) 0.99    5039.0   40500.00
      2    21251.87   26.04    1.719  0.30( 0.30) 0.99    6264.9   40440.00
      3    21415.02   26.94    1.680  0.30( 0.30) 0.99    6590.8   12710.00
      4    21799.24   29.30    1.577  0.30( 0.30) 0.99    7406.9   31600.00
      5    22086.88   31.20    1.523  0.30( 0.30) 0.99    8046.8   31810.00
      6    23987.79   43.72    1.291  0.30( 0.30) 0.99   12572.2   40100.00
      7    25969.34   53.29    1.154  0.30( 0.30) 0.99   15875.0   11801.00
      8    28352.12   64.39    1.046  0.30( 0.30) 0.99   20402.4   11530.00
      9    29702.56   73.22    0.997  0.30( 0.30) 0.99   25033.7   11910.00
     10    31838.35   83.52    0.939  0.30( 0.30) 0.99   31362.1   11350.00
     11    32469.41   88.31    0.912  0.30( 0.30) 0.99   34535.2   11130.00
     12    32358.62   94.35    0.886  0.30( 0.30) 0.99   37462.3   12300.00
     13    32281.23   98.22    0.872  0.30( 0.30) 0.99   39524.4   11620.00
     14    31987.24  103.03    0.855  0.30( 0.30) 0.99   41722.9   12400.00
     15    31732.46  106.27    0.843  0.30( 0.30) 0.99   43035.8   11111.00
     16    31275.77  112.39    0.821  0.30( 0.30) 0.99   45124.4   12201.00
     17    30528.99  119.71    0.794  0.30( 0.30) 0.99   47016.9   12231.00
     18    29733.42  127.02    0.778  0.30( 0.30) 0.99   48571.0   10400.00
     19    28440.00  136.15    0.758  0.30( 0.30) 0.99   50016.2   12010.00
     20    27556.93  141.33    0.747  0.30( 0.30) 0.99   50279.8   10210.00
     21    27012.80  145.19    0.738  0.30( 0.30) 0.99   50424.9   12000.00
     22    23931.65  170.77    0.683  0.30( 0.30) 0.99   51039.5   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       95.39   24.29    1.801  0.30( 0.25) 0.83      68.1   31500.00
  LONGEST FLOWPATH FROM NODE  31500.00 TO NODE  12720.50 =    4043.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20288.38   22.26    1.907  0.30( 0.30) 0.99    5101.4   40500.00
      2    20858.80   24.29    1.801  0.30( 0.30) 0.99    5766.4   31500.00
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      3    21342.23   26.04    1.719  0.30( 0.30) 0.99    6333.0   40440.00
      4    21502.96   26.94    1.680  0.30( 0.30) 0.99    6658.8   12710.00
      5    21880.90   29.30    1.577  0.30( 0.30) 0.99    7475.0   31600.00
      6    22165.20   31.20    1.523  0.30( 0.30) 0.99    8114.9   31810.00
      7    24051.87   43.72    1.291  0.30( 0.30) 0.99   12640.3   40100.00
      8    26025.00   53.29    1.154  0.30( 0.30) 0.99   15943.1   11801.00
      9    28401.15   64.39    1.046  0.30( 0.30) 0.99   20470.5   11530.00
     10    29748.54   73.22    0.997  0.30( 0.30) 0.99   25101.8   11910.00
     11    31880.77   83.52    0.939  0.30( 0.30) 0.99   31430.2   11350.00
     12    32510.17   88.31    0.912  0.30( 0.30) 0.99   34603.3   11130.00
     13    32397.82   94.35    0.886  0.30( 0.30) 0.99   37530.4   12300.00
     14    32319.58   98.22    0.872  0.30( 0.30) 0.99   39592.5   11620.00
     15    32024.50  103.03    0.855  0.30( 0.30) 0.99   41791.0   12400.00
     16    31769.00  106.27    0.843  0.30( 0.30) 0.99   43103.9   11111.00
     17    31310.95  112.39    0.821  0.30( 0.30) 0.99   45192.5   12201.00
     18    30562.54  119.71    0.794  0.30( 0.30) 0.99   47085.0   12231.00
     19    29765.97  127.02    0.778  0.30( 0.30) 0.99   48639.1   10400.00
     20    28471.33  136.15    0.758  0.30( 0.30) 0.99   50084.3   12010.00
     21    27587.57  141.33    0.747  0.30( 0.30) 0.99   50347.9   10210.00
     22    27042.93  145.19    0.738  0.30( 0.30) 0.99   50493.0   12000.00
     23    23958.38  170.77    0.683  0.30( 0.30) 0.99   51107.6   10100.00
   TOTAL AREA(ACRES) =     51107.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    32510.17  Tc(MIN.) =   88.310
  EFFECTIVE AREA(ACRES) =  34603.29  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51107.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    256.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   438.77   CHANNEL SLOPE =  0.0046
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.72
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.908
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.15      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   32527.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.47
  AVERAGE FLOW DEPTH(FEET) =   9.72   TRAVEL TIME(MIN.) =   0.54
  Tc(MIN.) =   88.85
  SUBAREA AREA(ACRES) =    62.15       SUBAREA RUNOFF(CFS) =   34.04
  EFFECTIVE AREA(ACRES) =  34665.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    51169.7         PEAK FLOW RATE(CFS) =   32510.17
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.72   FLOW VELOCITY(FEET/SEC.) =  13.46
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12721.00 =  109120.82 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20288.38   22.89    1.874  0.30( 0.30) 0.99    5163.6   40500.00
      2    20858.80   24.92    1.768  0.30( 0.30) 0.99    5828.6   31500.00
      3    21342.23   26.66    1.692  0.30( 0.30) 0.99    6395.2   40440.00
      4    21502.96   27.57    1.653  0.30( 0.30) 0.99    6721.0   12710.00
      5    21880.90   29.92    1.551  0.30( 0.30) 0.99    7537.2   31600.00
      6    22165.20   31.81    1.511  0.30( 0.30) 0.99    8177.1   31810.00
      7    24051.87   44.32    1.282  0.30( 0.30) 0.99   12702.5   40100.00
      8    26025.00   53.88    1.147  0.30( 0.30) 0.99   16005.2   11801.00
      9    28401.15   64.95    1.043  0.30( 0.30) 0.99   20532.7   11530.00
     10    29748.54   73.78    0.993  0.30( 0.30) 0.99   25163.9   11910.00
     11    31880.77   84.06    0.935  0.30( 0.30) 0.99   31492.3   11350.00
     12    32510.17   88.85    0.908  0.30( 0.30) 0.99   34665.4   11130.00
     13    32397.82   94.89    0.884  0.30( 0.30) 0.99   37592.6   12300.00
     14    32319.58   98.77    0.870  0.30( 0.30) 0.99   39654.6   11620.00
     15    32024.50  103.58    0.853  0.30( 0.30) 0.99   41853.2   12400.00
     16    31769.00  106.81    0.841  0.30( 0.30) 0.99   43166.0   11111.00
     17    31310.95  112.94    0.819  0.30( 0.30) 0.99   45254.6   12201.00
     18    30562.54  120.26    0.792  0.30( 0.30) 0.99   47147.2   12231.00
     19    29765.97  127.58    0.777  0.30( 0.30) 0.99   48701.2   10400.00
     20    28471.33  136.72    0.757  0.30( 0.30) 0.99   50146.5   12010.00
     21    27587.57  141.91    0.746  0.30( 0.30) 0.99   50410.1   10210.00
     22    27042.93  145.77    0.737  0.30( 0.30) 0.99   50555.2   12000.00
     23    23958.38  171.37    0.682  0.30( 0.30) 0.99   51169.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   32510.17  Tc(MIN.) =   88.85
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34665.44

****************************************************************************
  FLOW PROCESS FROM NODE  12721.00 TO NODE  12722.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    256.00  DOWNSTREAM(FEET) =    255.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.42   CHANNEL SLOPE =  0.0012
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  14.08
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.900
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   32513.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.54
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AVERAGE FLOW DEPTH(FEET) = 14.07 TRAVEL TIME(MIN.) = 1.62
Tc(MIN.) = 90.47
SUBAREA AREA(ACRES) = 11.24 SUBAREA RUNOFF(CFS) = 6.07
EFFECTIVE AREA(ACRES) = 34676.68 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51180.9 PEAK FLOW RATE(CFS) = 32510.17
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 14.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 14.07 FLOW VELOCITY(FEET/SEC.) = 8.54
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20288.38	24.77	1.776	0.30(0.30)	0.99	5174.8	40500.00
2	20858.80	26.78	1.687	0.30(0.30)	0.99	5839.8	31500.00
3	21342.23	28.51	1.612	0.30(0.30)	0.99	6406.4	40440.00
4	21502.96	29.41	1.573	0.30(0.30)	0.99	6732.2	12710.00
5	21880.90	31.75	1.512	0.30(0.30)	0.99	7548.4	31600.00
6	22165.20	33.64	1.475	0.30(0.30)	0.99	8188.3	31810.00
7	24051.87	46.10	1.255	0.30(0.30)	0.99	12713.7	40100.00
8	26025.00	55.61	1.125	0.30(0.30)	0.99	16016.5	11801.00
9	28401.15	66.64	1.034	0.30(0.30)	0.99	20543.9	11530.00
10	29748.54	75.44	0.984	0.30(0.30)	0.99	25175.1	11910.00
11	31880.77	85.69	0.926	0.30(0.30)	0.99	31503.6	11350.00
12	32510.17	90.47	0.900	0.30(0.30)	0.99	34676.7	11130.00
13	32397.82	96.52	0.878	0.30(0.30)	0.99	37603.8	12300.00
14	32319.58	100.39	0.864	0.30(0.30)	0.99	39665.9	11620.00
15	32024.50	105.21	0.847	0.30(0.30)	0.99	41864.4	12400.00
16	31769.00	108.45	0.835	0.30(0.30)	0.99	43177.3	11111.00
17	31310.95	114.58	0.813	0.30(0.30)	0.99	45265.9	12201.00
18	30562.54	121.91	0.789	0.30(0.30)	0.99	47158.4	12231.00
19	29765.97	129.24	0.773	0.30(0.30)	0.99	48712.5	10400.00
20	28471.33	138.41	0.753	0.30(0.30)	0.99	50157.7	12010.00
21	27587.57	143.61	0.742	0.30(0.30)	0.99	50421.3	10210.00
22	27042.93	147.49	0.733	0.30(0.30)	0.99	50566.4	12000.00
23	23958.38	173.15	0.678	0.30(0.30)	0.99	51180.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 32510.17 Tc(MIN.) = 90.47
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34676.68

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610314W.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	494.95	37.34	0.30(0.30)	0.99	497.2	31400.00

TOTAL AREA(ACRES) = 497.2

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20288.38	24.77	1.776	0.30(0.30)	0.99	5174.8	40500.00
2	20858.80	26.78	1.687	0.30(0.30)	0.99	5839.8	31500.00
3	21342.23	28.51	1.612	0.30(0.30)	0.99	6406.4	40440.00
4	21502.96	29.41	1.573	0.30(0.30)	0.99	6732.2	12710.00
5	21880.90	31.75	1.512	0.30(0.30)	0.99	7548.4	31600.00
6	22165.20	33.64	1.475	0.30(0.30)	0.99	8188.3	31810.00
7	24051.87	46.10	1.255	0.30(0.30)	0.99	12713.7	40100.00
8	26025.00	55.61	1.125	0.30(0.30)	0.99	16016.5	11801.00
9	28401.15	66.64	1.034	0.30(0.30)	0.99	20543.9	11530.00
10	29748.54	75.44	0.984	0.30(0.30)	0.99	25175.1	11910.00
11	31880.77	85.69	0.926	0.30(0.30)	0.99	31503.6	11350.00
12	32510.17	90.47	0.900	0.30(0.30)	0.99	34676.7	11130.00
13	32397.82	96.52	0.878	0.30(0.30)	0.99	37603.8	12300.00
14	32319.58	100.39	0.864	0.30(0.30)	0.99	39665.9	11620.00
15	32024.50	105.21	0.847	0.30(0.30)	0.99	41864.4	12400.00
16	31769.00	108.45	0.835	0.30(0.30)	0.99	43177.3	11111.00
17	31310.95	114.58	0.813	0.30(0.30)	0.99	45265.9	12201.00
18	30562.54	121.91	0.789	0.30(0.30)	0.99	47158.4	12231.00
19	29765.97	129.24	0.773	0.30(0.30)	0.99	48712.5	10400.00
20	28471.33	138.41	0.753	0.30(0.30)	0.99	50157.7	12010.00
21	27587.57	143.61	0.742	0.30(0.30)	0.99	50421.3	10210.00
22	27042.93	147.49	0.733	0.30(0.30)	0.99	50566.4	12000.00
23	23958.38	173.15	0.678	0.30(0.30)	0.99	51180.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	494.95	37.34	1.401	0.30(0.30)	0.99	497.2	31400.00

LONGEST FLOWPATH FROM NODE 31400.00 TO NODE 12722.00 = 14614.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20728.25	24.77	1.776	0.30(0.30)	0.99	5504.6	40500.00
2	21305.66	26.78	1.687	0.30(0.30)	0.99	6196.4	31500.00
3	21792.25	28.51	1.612	0.30(0.30)	0.99	6785.9	40440.00
4	21953.39	29.41	1.573	0.30(0.30)	0.99	7123.8	12710.00
5	22344.15	31.75	1.512	0.30(0.30)	0.99	7971.2	31600.00
6	22640.83	33.64	1.475	0.30(0.30)	0.99	8636.2	31810.00
7	23221.36	37.34	1.401	0.30(0.30)	0.99	10031.6	31400.00
8	24481.31	46.10	1.255	0.30(0.30)	0.99	13210.9	40100.00
9	26396.44	55.61	1.125	0.30(0.30)	0.99	16513.7	11801.00
10	28731.43	66.64	1.034	0.30(0.30)	0.99	21041.1	11530.00
11	30056.59	75.44	0.984	0.30(0.30)	0.99	25672.3	11910.00
12	32162.92	85.69	0.926	0.30(0.30)	0.99	32000.8	11350.00
13	32780.67	90.47	0.900	0.30(0.30)	0.99	35173.9	11130.00
14	32658.48	96.52	0.878	0.30(0.30)	0.99	38101.0	12300.00
15	32573.92	100.39	0.864	0.30(0.30)	0.99	40163.1	11620.00

```
    16    32271.01  105.21    0.847  0.30( 0.30) 0.99   42361.6   12400.00
    17    32010.23  108.45    0.835  0.30( 0.30) 0.99   43674.5   11111.00
    18    31542.18  114.58    0.813  0.30( 0.30) 0.99   45763.1   12201.00
    19    30783.08  121.91    0.789  0.30( 0.30) 0.99   47655.6   12231.00
    20    29979.39  129.24    0.773  0.30( 0.30) 0.99   49209.7   10400.00
    21    28675.85  138.41    0.753  0.30( 0.30) 0.99   50654.9   12010.00
    22    27787.03  143.61    0.742  0.30( 0.30) 0.99   50918.5   10210.00
    23    27238.63  147.49    0.733  0.30( 0.30) 0.99   51063.6   12000.00
    24    24129.14  173.15    0.678  0.30( 0.30) 0.99   51678.1   10100.00
  TOTAL AREA(ACRES) =     51678.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    32780.67  Tc(MIN.) =   90.473
 EFFECTIVE AREA(ACRES) =  35173.87  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    51678.1
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12722.00 =  109951.24 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    255.00  DOWNSTREAM(FEET) =    252.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =   624.00   CHANNEL SLOPE =  0.0046
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.72
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.898
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       62.42      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   32797.46
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.59
 AVERAGE FLOW DEPTH(FEET) =   9.71   TRAVEL TIME(MIN.) =   0.77
 Tc(MIN.) =   91.24
 SUBAREA AREA(ACRES) =    62.42       SUBAREA RUNOFF(CFS) =   33.57
 EFFECTIVE AREA(ACRES) =  35236.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =    51740.6         PEAK FLOW RATE(CFS) =   32780.67
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.71

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.71   FLOW VELOCITY(FEET/SEC.) =  13.59
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12740.00 =  110575.24 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1    20728.25   25.66    1.735  0.30( 0.30) 0.99    5567.0   40500.00
     2    21305.66   27.66    1.648  0.30( 0.30) 0.99    6258.8   31500.00
```



```
     3    21792.25   29.38    1.574  0.30( 0.30) 0.99    6848.4   40440.00
     4    21953.39   30.28    1.541  0.30( 0.30) 0.99    7186.2   12710.00
     5    22344.15   32.62    1.495  0.30( 0.30) 0.99    8033.6   31600.00
     6    22640.83   34.50    1.457  0.30( 0.30) 0.99    8698.6   31810.00
     7    23221.36   38.20    1.384  0.30( 0.30) 0.99   10094.1   31400.00
     8    24481.31   46.94    1.242  0.30( 0.30) 0.99   13273.3   40100.00
     9    26396.44   56.44    1.115  0.30( 0.30) 0.99   16576.1   11801.00
    10    28731.43   67.44    1.029  0.30( 0.30) 0.99   21103.5   11530.00
    11    30056.59   76.23    0.980  0.30( 0.30) 0.99   25734.8   11910.00
    12    32162.92   86.46    0.922  0.30( 0.30) 0.99   32063.2   11350.00
    13    32780.67   91.24    0.898  0.30( 0.30) 0.99   35236.3   11130.00
    14    32658.48   97.28    0.876  0.30( 0.30) 0.99   38163.4   12300.00
    15    32573.92  101.16    0.861  0.30( 0.30) 0.99   40225.5   11620.00
    16    32271.01  105.97    0.844  0.30( 0.30) 0.99   42424.0   12400.00
    17    32010.23  109.22    0.832  0.30( 0.30) 0.99   43736.9   11111.00
    18    31542.18  115.35    0.810  0.30( 0.30) 0.99   45825.5   12201.00
    19    30783.08  122.70    0.787  0.30( 0.30) 0.99   47718.0   12231.00
    20    29979.39  130.03    0.771  0.30( 0.30) 0.99   49272.1   10400.00
    21    28675.85  139.21    0.751  0.30( 0.30) 0.99   50717.3   12010.00
    22    27787.03  144.42    0.740  0.30( 0.30) 0.99   50980.9   10210.00
    23    27238.63  148.30    0.732  0.30( 0.30) 0.99   51126.0   12000.00
    24    24129.14  174.00    0.676  0.30( 0.30) 0.99   51740.6   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =   32780.67  Tc(MIN.) =   91.24
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   35236.29

****************************************************************************
 FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   91.24
 RAINFALL INTENSITY(INCH/HR) =   0.90
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99
 EFFECTIVE STREAM AREA(ACRES) =   35236.29
 TOTAL STREAM AREA(ACRES) =   51740.56
 PEAK FLOW RATE(CFS) AT CONFLUENCE =   32780.67

****************************************************************************
 FLOW PROCESS FROM NODE  12730.00 TO NODE  12731.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   561.54
 ELEVATION DATA: UPSTREAM(FEET) =    613.29  DOWNSTREAM(FEET) =    551.75

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.823
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.633
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

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  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        6.33      0.30     1.000     0   13.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.29
  TOTAL AREA(ACRES) =      6.33   PEAK FLOW RATE(CFS) =     13.29

****************************************************************************
  FLOW PROCESS FROM NODE  12731.00 TO NODE  12732.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    551.75  DOWNSTREAM(FEET) =    494.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   971.91   CHANNEL SLOPE =  0.0590
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.259
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.70
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   3.45
  Tc(MIN.) =   17.27
  SUBAREA AREA(ACRES) =    34.62       SUBAREA RUNOFF(CFS) =   61.03
  EFFECTIVE AREA(ACRES) =     40.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.9         PEAK FLOW RATE(CFS) =      72.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =   5.54
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12732.00 =    1533.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12732.00 TO NODE  12733.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    494.40  DOWNSTREAM(FEET) =    431.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1156.41   CHANNEL SLOPE =  0.0548
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.49
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.008
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     118.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.30
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   3.06
  Tc(MIN.) =   20.33
  SUBAREA AREA(ACRES) =    59.52       SUBAREA RUNOFF(CFS) =   91.49
  EFFECTIVE AREA(ACRES) =    100.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.5         PEAK FLOW RATE(CFS) =     154.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.68   FLOW VELOCITY(FEET/SEC.) =   6.86
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12733.00 =    2689.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12733.00 TO NODE  12734.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    431.00  DOWNSTREAM(FEET) =    367.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1654.48   CHANNEL SLOPE =  0.0386
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.16
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.787
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       64.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     197.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.52
  AVERAGE FLOW DEPTH(FEET) =   2.12   TRAVEL TIME(MIN.) =   4.23
  Tc(MIN.) =   24.56
  SUBAREA AREA(ACRES) =    64.05       SUBAREA RUNOFF(CFS) =   85.73
  EFFECTIVE AREA(ACRES) =    164.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      164.5         PEAK FLOW RATE(CFS) =     220.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.25   FLOW VELOCITY(FEET/SEC.) =   6.74
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12734.00 =    4344.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    367.11  DOWNSTREAM(FEET) =    252.10
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.98   CHANNEL SLOPE =  0.0611
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.07
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.615
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     235.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.09
  AVERAGE FLOW DEPTH(FEET) =   2.06   TRAVEL TIME(MIN.) =   3.88
  Tc(MIN.) =   28.43
  SUBAREA AREA(ACRES) =    26.02       SUBAREA RUNOFF(CFS) =   30.79
  EFFECTIVE AREA(ACRES) =    190.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      190.5         PEAK FLOW RATE(CFS) =     225.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.02   FLOW VELOCITY(FEET/SEC.) =   7.97
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12740.00 =    6225.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.43
  RAINFALL INTENSITY(INCH/HR) =   1.61
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     190.54
  TOTAL STREAM AREA(ACRES) =     190.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     225.50

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20728.25   25.66    1.735  0.30( 0.30) 0.99    5567.0   40500.00
      1    21305.66   27.66    1.648  0.30( 0.30) 0.99    6258.8   31500.00
      1    21792.25   29.38    1.574  0.30( 0.30) 0.99    6848.4   40440.00
      1    21953.39   30.28    1.541  0.30( 0.30) 0.99    7186.2   12710.00
      1    22344.15   32.62    1.495  0.30( 0.30) 0.99    8033.6   31600.00
      1    22640.83   34.50    1.457  0.30( 0.30) 0.99    8698.6   31810.00
      1    23221.36   38.20    1.384  0.30( 0.30) 0.99   10094.1   31400.00
      1    24481.31   46.94    1.242  0.30( 0.30) 0.99   13273.3   40100.00
      1    26396.44   56.44    1.115  0.30( 0.30) 0.99   16576.1   11801.00
      1    28731.43   67.44    1.029  0.30( 0.30) 0.99   21103.5   11530.00
      1    30056.59   76.23    0.980  0.30( 0.30) 0.99   25734.8   11910.00
```



```
      1    32162.92   86.46    0.922  0.30( 0.30) 0.99   32063.2   11350.00
      1    32780.67   91.24    0.898  0.30( 0.30) 0.99   35236.3   11130.00
      1    32658.48   97.28    0.876  0.30( 0.30) 0.99   38163.4   12300.00
      1    32573.92  101.16    0.861  0.30( 0.30) 0.99   40225.5   11620.00
      1    32271.01  105.97    0.844  0.30( 0.30) 0.99   42424.0   12400.00
      1    32010.23  109.22    0.832  0.30( 0.30) 0.99   43736.9   11111.00
      1    31542.18  115.35    0.810  0.30( 0.30) 0.99   45825.5   12201.00
      1    30783.08  122.70    0.787  0.30( 0.30) 0.99   47718.0   12231.00
      1    29979.39  130.03    0.771  0.30( 0.30) 0.99   49272.1   10400.00
      1    28675.85  139.21    0.751  0.30( 0.30) 0.99   50717.3   12010.00
      1    27787.03  144.42    0.740  0.30( 0.30) 0.99   50980.9   10210.00
      1    27238.63  148.30    0.732  0.30( 0.30) 0.99   51126.0   12000.00
      1    24129.14  174.00    0.676  0.30( 0.30) 0.99   51740.6   10100.00
      2      225.50   28.43    1.615  0.30( 0.30) 1.00     190.5   12730.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20950.39   25.66    1.735  0.30( 0.30) 0.99    5739.0   40500.00
      2    21530.63   27.66    1.648  0.30( 0.30) 0.99    6444.2   31500.00
      3    21749.51   28.43    1.615  0.30( 0.30) 0.99    6713.9   12730.00
      4    22010.70   29.38    1.574  0.30( 0.30) 0.99    7038.9   40440.00
      5    22166.28   30.28    1.541  0.30( 0.30) 0.99    7376.8   12710.00
      6    22549.07   32.62    1.495  0.30( 0.30) 0.99    8224.1   31600.00
      7    22839.31   34.50    1.457  0.30( 0.30) 0.99    8889.2   31810.00
      8    23407.22   38.20    1.384  0.30( 0.30) 0.99   10284.6   31400.00
      9    24642.83   46.94    1.242  0.30( 0.30) 0.99   13463.9   40100.00
     10    26536.25   56.44    1.115  0.30( 0.30) 0.99   16766.6   11801.00
     11    28856.46   67.44    1.029  0.30( 0.30) 0.99   21294.1   11530.00
     12    30173.14   76.23    0.980  0.30( 0.30) 0.99   25925.3   11910.00
     13    32269.58   86.46    0.922  0.30( 0.30) 0.99   32253.7   11350.00
     14    32883.15   91.24    0.898  0.30( 0.30) 0.99   35426.8   11130.00
     15    32757.19   97.28    0.876  0.30( 0.30) 0.99   38354.0   12300.00
     16    32670.21  101.16    0.861  0.30( 0.30) 0.99   40416.0   11620.00
     17    32364.30  105.97    0.844  0.30( 0.30) 0.99   42614.6   12400.00
     18    32101.50  109.22    0.832  0.30( 0.30) 0.99   43927.4   11111.00
     19    31629.63  115.35    0.810  0.30( 0.30) 0.99   46016.0   12201.00
     20    30866.63  122.70    0.787  0.30( 0.30) 0.99   47908.6   12231.00
     21    30060.22  130.03    0.771  0.30( 0.30) 0.99   49462.6   10400.00
     22    28753.26  139.21    0.751  0.30( 0.30) 0.99   50907.9   12010.00
     23    27862.51  144.42    0.740  0.30( 0.30) 0.99   51171.4   10210.00
     24    27312.67  148.30    0.732  0.30( 0.30) 0.99   51316.6   12000.00
     25    24193.63  174.00    0.676  0.30( 0.30) 0.99   51931.1   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   32883.15    Tc(MIN.) =    91.24
  EFFECTIVE AREA(ACRES) =   35426.83   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51931.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12740.00 =  110575.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12741.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    252.10  DOWNSTREAM(FEET) =    247.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   401.47   CHANNEL SLOPE =  0.0127
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.30
  CHANNEL FLOW THRU SUBAREA(CFS) =   32883.15
  FLOW VELOCITY(FEET/SEC.) =  19.03   FLOW DEPTH(FEET) =   7.30
  TRAVEL TIME(MIN.) =   0.35   Tc(MIN.) =   91.59
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20950.39   26.07    1.717  0.30( 0.30) 0.99    5739.0   40500.00
      2    21530.63   28.07    1.631  0.30( 0.30) 0.99    6444.2   31500.00
      3    21749.51   28.84    1.597  0.30( 0.30) 0.99    6713.9   12730.00
      4    22010.70   29.79    1.556  0.30( 0.30) 0.99    7038.9   40440.00
      5    22166.28   30.69    1.533  0.30( 0.30) 0.99    7376.8   12710.00
      6    22549.07   33.02    1.487  0.30( 0.30) 0.99    8224.1   31600.00
      7    22839.31   34.90    1.449  0.30( 0.30) 0.99    8889.2   31810.00
      8    23407.22   38.60    1.376  0.30( 0.30) 0.99   10284.6   31400.00
      9    24642.83   47.33    1.236  0.30( 0.30) 0.99   13463.9   40100.00
     10    26536.25   56.81    1.111  0.30( 0.30) 0.99   16766.6   11801.00
     11    28856.46   67.81    1.027  0.30( 0.30) 0.99   21294.1   11530.00
     12    30173.14   76.59    0.978  0.30( 0.30) 0.99   25925.3   11910.00
     13    32269.58   86.82    0.920  0.30( 0.30) 0.99   32253.7   11350.00
     14    32883.15   91.59    0.896  0.30( 0.30) 0.99   35426.8   11130.00
     15    32757.19   97.63    0.874  0.30( 0.30) 0.99   38354.0   12300.00
     16    32670.21  101.51    0.860  0.30( 0.30) 0.99   40416.0   11620.00
     17    32364.30  106.33    0.843  0.30( 0.30) 0.99   42614.6   12400.00
     18    32101.50  109.57    0.831  0.30( 0.30) 0.99   43927.4   11111.00
     19    31629.63  115.71    0.809  0.30( 0.30) 0.99   46016.0   12201.00
     20    30866.63  123.05    0.786  0.30( 0.30) 0.99   47908.6   12231.00
     21    30060.22  130.39    0.770  0.30( 0.30) 0.99   49462.6   10400.00
     22    28753.26  139.58    0.751  0.30( 0.30) 0.99   50907.9   12010.00
     23    27862.51  144.79    0.739  0.30( 0.30) 0.99   51171.4   10210.00
     24    27312.67  148.67    0.731  0.30( 0.30) 0.99   51316.6   12000.00
     25    24193.63  174.39    0.675  0.30( 0.30) 0.99   51931.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   32883.15  Tc(MIN.) =   91.59
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   35426.83

********************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE = 15.1
--------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610313W.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
```



```
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     186.09   23.26  0.30( 0.29) 0.97     132.0   31300.00
    TOTAL AREA(ACRES) =      132.0

********************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20950.39   26.07    1.717  0.30( 0.30) 0.99    5739.0   40500.00
      2    21530.63   28.07    1.631  0.30( 0.30) 0.99    6444.2   31500.00
      3    21749.51   28.84    1.597  0.30( 0.30) 0.99    6713.9   12730.00
      4    22010.70   29.79    1.556  0.30( 0.30) 0.99    7038.9   40440.00
      5    22166.28   30.69    1.533  0.30( 0.30) 0.99    7376.8   12710.00
      6    22549.07   33.02    1.487  0.30( 0.30) 0.99    8224.1   31600.00
      7    22839.31   34.90    1.449  0.30( 0.30) 0.99    8889.2   31810.00
      8    23407.22   38.60    1.376  0.30( 0.30) 0.99   10284.6   31400.00
      9    24642.83   47.33    1.236  0.30( 0.30) 0.99   13463.9   40100.00
     10    26536.25   56.81    1.111  0.30( 0.30) 0.99   16766.6   11801.00
     11    28856.46   67.81    1.027  0.30( 0.30) 0.99   21294.1   11530.00
     12    30173.14   76.59    0.978  0.30( 0.30) 0.99   25925.3   11910.00
     13    32269.58   86.82    0.920  0.30( 0.30) 0.99   32253.7   11350.00
     14    32883.15   91.59    0.896  0.30( 0.30) 0.99   35426.8   11130.00
     15    32757.19   97.63    0.874  0.30( 0.30) 0.99   38354.0   12300.00
     16    32670.21  101.51    0.860  0.30( 0.30) 0.99   40416.0   11620.00
     17    32364.30  106.33    0.843  0.30( 0.30) 0.99   42614.6   12400.00
     18    32101.50  109.57    0.831  0.30( 0.30) 0.99   43927.4   11111.00
     19    31629.63  115.71    0.809  0.30( 0.30) 0.99   46016.0   12201.00
     20    30866.63  123.05    0.786  0.30( 0.30) 0.99   47908.6   12231.00
     21    30060.22  130.39    0.770  0.30( 0.30) 0.99   49462.6   10400.00
     22    28753.26  139.58    0.751  0.30( 0.30) 0.99   50907.9   12010.00
     23    27862.51  144.79    0.739  0.30( 0.30) 0.99   51171.4   10210.00
     24    27312.67  148.67    0.731  0.30( 0.30) 0.99   51316.6   12000.00
     25    24193.63  174.39    0.675  0.30( 0.30) 0.99   51931.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     186.09   23.26    1.855  0.30( 0.29) 0.97     132.0   31300.00
  LONGEST FLOWPATH FROM NODE  31300.00 TO NODE  12741.00 =    5775.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20683.61   23.26    1.855  0.30( 0.30) 0.99    5251.0   31300.00
      2    21120.10   26.07    1.717  0.30( 0.30) 0.99    5871.0   40500.00
      3    21690.04   28.07    1.631  0.30( 0.30) 0.99    6576.1   31500.00
      4    21904.93   28.84    1.597  0.30( 0.30) 0.99    6845.9   12730.00
      5    22161.22   29.79    1.556  0.30( 0.30) 0.99    7170.9   40440.00
      6    22314.08   30.69    1.533  0.30( 0.30) 0.99    7508.7   12710.00
      7    22691.34   33.02    1.487  0.30( 0.30) 0.99    8356.1   31600.00
      8    22977.12   34.90    1.449  0.30( 0.30) 0.99    9021.1   31810.00
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      9    23536.29   38.60    1.376  0.30( 0.30) 0.99   10416.6   31400.00
     10    24755.23   47.33    1.236  0.30( 0.30) 0.99   13595.9   40100.00
     11    26633.72   56.81    1.111  0.30( 0.30) 0.99   16898.6   11801.00
     12    28944.00   67.81    1.027  0.30( 0.30) 0.99   21426.0   11530.00
     13    30254.79   76.59    0.978  0.30( 0.30) 0.99   26057.3   11910.00
     14    32344.37   86.82    0.920  0.30( 0.30) 0.99   32385.7   11350.00
     15    32955.12   91.59    0.896  0.30( 0.30) 0.99   35558.8   11130.00
     16    32826.54   97.63    0.874  0.30( 0.30) 0.99   38486.0   12300.00
     17    32737.89  101.51    0.860  0.30( 0.30) 0.99   40548.0   11620.00
     18    32429.89  106.33    0.843  0.30( 0.30) 0.99   42746.5   12400.00
     19    32165.69  109.57    0.831  0.30( 0.30) 0.99   44059.4   11111.00
     20    31691.17  115.71    0.809  0.30( 0.30) 0.99   46148.0   12201.00
     21    30925.52  123.05    0.786  0.30( 0.30) 0.99   48040.6   12231.00
     22    30117.22  130.39    0.770  0.30( 0.30) 0.99   49594.6   10400.00
     23    28807.90  139.58    0.751  0.30( 0.30) 0.99   51039.8   12010.00
     24    27915.80  144.79    0.739  0.30( 0.30) 0.99   51303.4   10210.00
     25    27364.95  148.67    0.731  0.30( 0.30) 0.99   51448.5   12000.00
     26    24239.28  174.39    0.675  0.30( 0.30) 0.99   52063.1   10100.00
   TOTAL AREA(ACRES) =     52063.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    32955.12  Tc(MIN.) =   91.590
  EFFECTIVE AREA(ACRES) =  35558.80  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    52063.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12800.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    247.00  DOWNSTREAM(FEET) =    240.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   819.00   CHANNEL SLOPE =  0.0085
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.19
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.893
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   32959.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.70
  AVERAGE FLOW DEPTH(FEET) =   8.19   TRAVEL TIME(MIN.) =   0.82
  Tc(MIN.) =   92.41
  SUBAREA AREA(ACRES) =    17.31       SUBAREA RUNOFF(CFS) =    9.24
  EFFECTIVE AREA(ACRES) =  35576.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    52080.4         PEAK FLOW RATE(CFS) =   32955.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.19
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.19   FLOW VELOCITY(FEET/SEC.) =  16.70
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20683.61   24.21    1.805  0.30( 0.30) 0.99    5268.3   31300.00
      2    21120.10   27.02    1.676  0.30( 0.30) 0.99    5888.3   40500.00
      3    21690.04   29.01    1.590  0.30( 0.30) 0.99    6593.4   31500.00
      4    21904.93   29.78    1.557  0.30( 0.30) 0.99    6863.2   12730.00
      5    22161.22   30.72    1.533  0.30( 0.30) 0.99    7188.2   40440.00
      6    22314.08   31.62    1.515  0.30( 0.30) 0.99    7526.0   12710.00
      7    22691.34   33.95    1.468  0.30( 0.30) 0.99    8373.4   31600.00
      8    22977.12   35.83    1.431  0.30( 0.30) 0.99    9038.4   31810.00
      9    23536.29   39.51    1.358  0.30( 0.30) 0.99   10433.9   31400.00
     10    24755.23   48.23    1.222  0.30( 0.30) 0.99   13613.2   40100.00
     11    26633.72   57.69    1.100  0.30( 0.30) 0.99   16915.9   11801.00
     12    28944.00   68.66    1.022  0.30( 0.30) 0.99   21443.4   11530.00
     13    30254.79   77.43    0.973  0.30( 0.30) 0.99   26074.6   11910.00
     14    32344.37   87.64    0.915  0.30( 0.30) 0.99   32403.0   11350.00
     15    32955.12   92.41    0.893  0.30( 0.30) 0.99   35576.1   11130.00
     16    32826.54   98.45    0.871  0.30( 0.30) 0.99   38503.3   12300.00
     17    32737.89  102.33    0.857  0.30( 0.30) 0.99   40565.3   11620.00
     18    32429.89  107.15    0.840  0.30( 0.30) 0.99   42763.8   12400.00
     19    32165.69  110.39    0.828  0.30( 0.30) 0.99   44076.7   11111.00
     20    31691.17  116.54    0.806  0.30( 0.30) 0.99   46165.3   12201.00
     21    30925.52  123.89    0.785  0.30( 0.30) 0.99   48057.9   12231.00
     22    30117.22  131.23    0.769  0.30( 0.30) 0.99   49611.9   10400.00
     23    28807.90  140.43    0.749  0.30( 0.30) 0.99   51057.1   12010.00
     24    27915.80  145.66    0.737  0.30( 0.30) 0.99   51320.7   10210.00
     25    27364.95  149.54    0.729  0.30( 0.30) 0.99   51465.9   12000.00
     26    24239.28  175.30    0.673  0.30( 0.30) 0.99   52080.4   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   32955.12  Tc(MIN.) =   92.41
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   35576.11
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    52080.4  TC(MIN.) =     92.41
  EFFECTIVE AREA(ACRES) =  35576.11  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.994
  PEAK FLOW RATE(CFS)   =   32955.12

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20683.61   24.21    1.805  0.30( 0.30) 0.99    5268.3   31300.00
      2    21120.10   27.02    1.676  0.30( 0.30) 0.99    5888.3   40500.00
      3    21690.04   29.01    1.590  0.30( 0.30) 0.99    6593.4   31500.00
      4    21904.93   29.78    1.557  0.30( 0.30) 0.99    6863.2   12730.00
      5    22161.22   30.72    1.533  0.30( 0.30) 0.99    7188.2   40440.00
      6    22314.08   31.62    1.515  0.30( 0.30) 0.99    7526.0   12710.00
      7    22691.34   33.95    1.468  0.30( 0.30) 0.99    8373.4   31600.00
      8    22977.12   35.83    1.431  0.30( 0.30) 0.99    9038.4   31810.00
      9    23536.29   39.51    1.358  0.30( 0.30) 0.99   10433.9   31400.00
     10    24755.23   48.23    1.222  0.30( 0.30) 0.99   13613.2   40100.00
     11    26633.72   57.69    1.100  0.30( 0.30) 0.99   16915.9   11801.00
```

12	28944.00	68.66	1.022	0.30(0.30)	0.99	21443.4	11530.00
13	30254.79	77.43	0.973	0.30(0.30)	0.99	26074.6	11910.00
14	32344.37	87.64	0.915	0.30(0.30)	0.99	32403.0	11350.00
15	32955.12	92.41	0.893	0.30(0.30)	0.99	35576.1	11130.00
16	32826.54	98.45	0.871	0.30(0.30)	0.99	38503.3	12300.00
17	32737.89	102.33	0.857	0.30(0.30)	0.99	40565.3	11620.00
18	32429.89	107.15	0.840	0.30(0.30)	0.99	42763.8	12400.00
19	32165.69	110.39	0.828	0.30(0.30)	0.99	44076.7	11111.00
20	31691.17	116.54	0.806	0.30(0.30)	0.99	46165.3	12201.00
21	30925.52	123.89	0.785	0.30(0.30)	0.99	48057.9	12231.00
22	30117.22	131.23	0.769	0.30(0.30)	0.99	49611.9	10400.00
23	28807.90	140.43	0.749	0.30(0.30)	0.99	51057.1	12010.00
24	27915.80	145.66	0.737	0.30(0.30)	0.99	51320.7	10210.00
25	27364.95	149.54	0.729	0.30(0.30)	0.99	51465.9	12000.00
26	24239.28	175.30	0.673	0.30(0.30)	0.99	52080.4	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S28.DAT
  TIME/DATE OF STUDY: 09:28 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.939
   2)   10.00;  3.217
   3)   15.00;  2.453
   4)   20.00;  2.025
   5)   25.00;  1.764
   6)   30.00;  1.547
   7)   40.00;  1.348
   8)   50.00;  1.195
   9)   60.00;  1.071
  10)   90.00;  0.902
  11)  120.00;  0.793
  12)  180.00;  0.663
  13)  360.00;  0.491
  14) 1200.00;  0.216
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610501W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1339.03   26.38  0.30( 0.29) 0.98    1025.9   50120.00
      2     1307.01   27.68  0.30( 0.29) 0.98    1041.3   50150.00
      3     1190.23   31.24  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1339.03   26.38  0.30( 0.29) 0.98    1025.9   50120.00
      2     1307.01   27.68  0.30( 0.29) 0.98    1041.3   50150.00
      3     1190.23   31.24  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1063.4  TC(MIN.) =     26.38
  EFFECTIVE AREA(ACRES) =   1025.92  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.981
  PEAK FLOW RATE(CFS)   =    1339.03

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1339.03   26.38    1.704  0.30( 0.29) 0.98    1025.9   50120.00
      2     1307.01   27.68    1.648  0.30( 0.29) 0.98    1041.3   50150.00
      3     1190.23   31.24    1.522  0.30( 0.29) 0.98    1063.4   50100.00
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**********************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                           Analysis prepared by:




--------------------------------------------------------------------------------
  FILE NAME: S29.DAT
  TIME/DATE OF STUDY: 09:29 09/12/2017
================================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
================================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.924
   2)   10.00;  3.208
   3)   15.00;  2.447
   4)   20.00;  2.021
   5)   25.00;  1.762
   6)   30.00;  1.545
   7)   40.00;  1.346
   8)   50.00;  1.193
   9)   60.00;  1.069
  10)   90.00;  0.900
  11)  120.00;  0.790
  12)  180.00;  0.660
  13)  360.00;  0.489
  14) 1200.00;  0.215
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**********************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE = 15.1
----------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==================================================================================
  PEAK FLOWRATE TABLE FILE NAME: S27.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    21120.10   27.02  0.30( 0.30) 0.99    5888.3   40500.00
      2    22314.08   31.62  0.30( 0.30) 0.99    7526.0   12710.00
      3    22977.12   35.83  0.30( 0.30) 0.99    9038.4   31810.00
      4    23536.29   39.51  0.30( 0.30) 0.99   10433.9   31400.00
      5    24755.23   48.23  0.30( 0.30) 0.99   13613.2   40100.00
      6    26633.72   57.69  0.30( 0.30) 0.99   16915.9   11801.00
      7    28944.00   68.66  0.30( 0.30) 0.99   21443.4   11530.00
      8    30254.79   77.43  0.30( 0.30) 0.99   26074.6   11910.00
      9    32344.37   87.64  0.30( 0.30) 0.99   32403.0   11350.00
     10    32955.12   92.41  0.30( 0.30) 0.99   35576.1   11130.00
     11    32826.54   98.45  0.30( 0.30) 0.99   38503.3   12300.00
     12    32737.89  102.33  0.30( 0.30) 0.99   40565.3   11620.00
     13    32429.89  107.15  0.30( 0.30) 0.99   42763.8   12400.00
     14    31691.17  116.54  0.30( 0.30) 0.99   46165.3   12201.00
     15    30925.52  123.89  0.30( 0.30) 0.99   48057.9   12231.00
     16    30117.22  131.23  0.30( 0.30) 0.99   49611.9   10400.00
     17    28807.90  140.43  0.30( 0.30) 0.99   51057.1   12010.00
     18    27915.80  145.66  0.30( 0.30) 0.99   51320.7   10210.00
     19    27364.95  149.54  0.30( 0.30) 0.99   51465.9   12000.00
     20    24239.28  175.30  0.30( 0.30) 0.99   52080.4   10100.00
    TOTAL AREA(ACRES) =    52080.4

**********************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
----------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==================================================================================
  PEAK FLOWRATE TABLE FILE NAME: S28.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1339.03   26.38  0.30( 0.29) 0.98    1025.9   50120.00
      2     1307.01   27.68  0.30( 0.29) 0.98    1041.3   50150.00
      3     1190.23   31.24  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**********************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
----------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==================================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1339.03   26.38  0.30( 0.29) 0.98    1025.9   50120.00
      2     1307.01   27.68  0.30( 0.29) 0.98    1041.3   50150.00
      3     1190.23   31.24  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =      1063.4
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1339.03   26.38    1.702  0.30( 0.29) 0.98    1025.9   50120.00
      2     1307.01   27.68    1.646  0.30( 0.29) 0.98    1041.3   50150.00
      3     1190.23   31.24    1.520  0.30( 0.29) 0.98    1063.4   50100.00
  LONGEST FLOWPATH FROM NODE  50150.00 TO NODE  12800.00 =   11349.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    21120.10   27.02    1.674  0.30( 0.30) 0.99    5888.3   40500.00
      2    22314.08   31.62    1.513  0.30( 0.30) 0.99    7526.0   12710.00
      3    22977.12   35.83    1.429  0.30( 0.30) 0.99    9038.4   31810.00
      4    23536.29   39.51    1.356  0.30( 0.30) 0.99   10433.9   31400.00
      5    24755.23   48.23    1.220  0.30( 0.30) 0.99   13613.2   40100.00
      6    26633.72   57.69    1.098  0.30( 0.30) 0.99   16915.9   11801.00
      7    28944.00   68.66    1.020  0.30( 0.30) 0.99   21443.4   11530.00
      8    30254.79   77.43    0.971  0.30( 0.30) 0.99   26074.6   11910.00
      9    32344.37   87.64    0.913  0.30( 0.30) 0.99   32403.0   11350.00
     10    32955.12   92.41    0.891  0.30( 0.30) 0.99   35576.1   11130.00
     11    32826.54   98.45    0.869  0.30( 0.30) 0.99   38503.3   12300.00
     12    32737.89  102.33    0.855  0.30( 0.30) 0.99   40565.3   11620.00
     13    32429.89  107.15    0.837  0.30( 0.30) 0.99   42763.8   12400.00
     14    31691.17  116.54    0.803  0.30( 0.30) 0.99   46165.3   12201.00
     15    30925.52  123.89    0.782  0.30( 0.30) 0.99   48057.9   12231.00
     16    30117.22  131.23    0.766  0.30( 0.30) 0.99   49611.9   10400.00
     17    28807.90  140.43    0.746  0.30( 0.30) 0.99   51057.1   12010.00
     18    27915.80  145.66    0.734  0.30( 0.30) 0.99   51320.7   10210.00
     19    27364.95  149.54    0.726  0.30( 0.30) 0.99   51465.9   12000.00
     20    24239.28  175.30    0.670  0.30( 0.30) 0.99   52080.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22374.96   26.38    1.702  0.30( 0.30) 0.99    6774.9   50120.00
      2    22443.33   27.02    1.674  0.30( 0.30) 0.99    6921.8   40500.00
      3    22597.59   27.68    1.646  0.30( 0.30) 0.99    7163.4   50150.00
      4    23404.64   31.24    1.520  0.30( 0.30) 0.99    8452.7   50100.00
      5    23496.90   31.62    1.513  0.30( 0.30) 0.99    8589.4   12710.00
      6    24078.67   35.83    1.429  0.30( 0.30) 0.99   10101.8   31810.00
      7    24566.61   39.51    1.356  0.30( 0.30) 0.99   11497.3   31400.00
      8    25653.95   48.23    1.220  0.30( 0.30) 0.99   14676.6   40100.00
      9    27413.48   57.69    1.098  0.30( 0.30) 0.99   17979.3   11801.00
     10    29648.58   68.66    1.020  0.30( 0.30) 0.99   22506.7   11530.00
     11    30911.42   77.43    0.971  0.30( 0.30) 0.99   27138.0   11910.00
     12    32945.17   87.64    0.913  0.30( 0.30) 0.99   33466.4   11350.00
     13    33534.45   92.41    0.891  0.30( 0.30) 0.99   36639.5   11130.00
     14    33384.34   98.45    0.869  0.30( 0.30) 0.99   39566.6   12300.00
     15    33281.89  102.33    0.855  0.30( 0.30) 0.99   41628.7   11620.00
```



```
     16    32956.74  107.15    0.837  0.30( 0.30) 0.99   43827.2   12400.00
     17    32184.59  116.54    0.803  0.30( 0.30) 0.99   47228.7   12201.00
     18    31398.44  123.89    0.782  0.30( 0.30) 0.99   49121.3   12231.00
     19    30574.69  131.23    0.766  0.30( 0.30) 0.99   50675.3   10400.00
     20    29246.02  140.43    0.746  0.30( 0.30) 0.99   52120.5   12010.00
     21    28342.94  145.66    0.734  0.30( 0.30) 0.99   52384.1   10210.00
     22    27783.91  149.54    0.726  0.30( 0.30) 0.99   52529.2   12000.00
     23    24604.06  175.30    0.670  0.30( 0.30) 0.99   53143.8   10100.00
   TOTAL AREA(ACRES) =     53143.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    33534.45  Tc(MIN.) =   92.407
  EFFECTIVE AREA(ACRES) =  36639.50  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53143.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12801.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.00  DOWNSTREAM(FEET) =    234.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.96   CHANNEL SLOPE =  0.0054
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.43
  CHANNEL FLOW THRU SUBAREA(CFS) =   33534.45
  FLOW VELOCITY(FEET/SEC.) =  14.40   FLOW DEPTH(FEET) =   9.43
  TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =   93.69
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22374.96   27.86    1.638  0.30( 0.30) 0.99    6774.9   50120.00
      2    22443.33   28.49    1.610  0.30( 0.30) 0.99    6921.8   40500.00
      3    22597.59   29.15    1.582  0.30( 0.30) 0.99    7163.4   50150.00
      4    23404.64   32.68    1.492  0.30( 0.30) 0.99    8452.7   50100.00
      5    23496.90   33.07    1.484  0.30( 0.30) 0.99    8589.4   12710.00
      6    24078.67   37.26    1.401  0.30( 0.30) 0.99   10101.8   31810.00
      7    24566.61   40.94    1.332  0.30( 0.30) 0.99   11497.3   31400.00
      8    25653.95   49.63    1.199  0.30( 0.30) 0.99   14676.6   40100.00
      9    27413.48   59.07    1.081  0.30( 0.30) 0.99   17979.3   11801.00
     10    29648.58   70.00    1.013  0.30( 0.30) 0.99   22506.7   11530.00
     11    30911.42   78.75    0.963  0.30( 0.30) 0.99   27138.0   11910.00
     12    32945.17   88.93    0.906  0.30( 0.30) 0.99   33466.4   11350.00
     13    33534.45   93.69    0.886  0.30( 0.30) 0.99   36639.5   11130.00
     14    33384.34   99.74    0.864  0.30( 0.30) 0.99   39566.6   12300.00
     15    33281.89  103.62    0.850  0.30( 0.30) 0.99   41628.7   11620.00
     16    32956.74  108.44    0.832  0.30( 0.30) 0.99   43827.2   12400.00
     17    32184.59  117.84    0.798  0.30( 0.30) 0.99   47228.7   12201.00
     18    31398.44  125.20    0.779  0.30( 0.30) 0.99   49121.3   12231.00
     19    30574.69  132.56    0.763  0.30( 0.30) 0.99   50675.3   10400.00
     20    29246.02  141.78    0.743  0.30( 0.30) 0.99   52120.5   12010.00
     21    28342.94  147.01    0.731  0.30( 0.30) 0.99   52384.1   10210.00
     22    27783.91  150.91    0.723  0.30( 0.30) 0.99   52529.2   12000.00
```

```
    23    24604.06  176.72    0.667  0.30( 0.30) 0.99   53143.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   33534.45  Tc(MIN.) =   93.69
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   36639.50

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610502W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       72.65   10.85  0.30( 0.28) 0.94      28.9   50200.00
    TOTAL AREA(ACRES) =       28.9

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22374.96   27.86    1.638  0.30( 0.30) 0.99    6774.9   50120.00
      2    22443.33   28.49    1.610  0.30( 0.30) 0.99    6921.8   40500.00
      3    22597.59   29.15    1.582  0.30( 0.30) 0.99    7163.4   50150.00
      4    23404.64   32.68    1.492  0.30( 0.30) 0.99    8452.7   50100.00
      5    23496.90   33.07    1.484  0.30( 0.30) 0.99    8589.4   12710.00
      6    24078.67   37.26    1.401  0.30( 0.30) 0.99   10101.8   31810.00
      7    24566.61   40.94    1.332  0.30( 0.30) 0.99   11497.3   31400.00
      8    25653.95   49.63    1.199  0.30( 0.30) 0.99   14676.6   40100.00
      9    27413.48   59.07    1.081  0.30( 0.30) 0.99   17979.3   11801.00
     10    29648.58   70.00    1.013  0.30( 0.30) 0.99   22506.7   11530.00
     11    30911.42   78.75    0.963  0.30( 0.30) 0.99   27138.0   11910.00
     12    32945.17   88.93    0.906  0.30( 0.30) 0.99   33466.4   11350.00
     13    33534.45   93.69    0.886  0.30( 0.30) 0.99   36639.5   11130.00
     14    33384.34   99.74    0.864  0.30( 0.30) 0.99   39566.6   12300.00
     15    33281.89  103.62    0.850  0.30( 0.30) 0.99   41628.7   11620.00
     16    32956.74  108.44    0.832  0.30( 0.30) 0.99   43827.2   12400.00
     17    32184.59  117.84    0.798  0.30( 0.30) 0.99   47228.7   12201.00
     18    31398.44  125.20    0.779  0.30( 0.30) 0.99   49121.3   12231.00
     19    30574.69  132.56    0.763  0.30( 0.30) 0.99   50675.3   10400.00
     20    29246.02  141.78    0.743  0.30( 0.30) 0.99   52120.5   12010.00
     21    28342.94  147.01    0.731  0.30( 0.30) 0.99   52384.1   10210.00
     22    27783.91  150.91    0.723  0.30( 0.30) 0.99   52529.2   12000.00
     23    24604.06  176.72    0.667  0.30( 0.30) 0.99   53143.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.
```



```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       72.65   10.85    3.078  0.30( 0.28) 0.94      28.9   50200.00
  LONGEST FLOWPATH FROM NODE  50200.00 TO NODE  12801.00 =    1426.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    18148.13   10.85    3.078  0.30( 0.30) 0.99    2668.1   50200.00
      2    22410.21   27.86    1.638  0.30( 0.30) 0.99    6803.8   50120.00
      3    22477.86   28.49    1.610  0.30( 0.30) 0.99    6950.7   40500.00
      4    22631.38   29.15    1.582  0.30( 0.30) 0.99    7192.3   50150.00
      5    23436.08   32.68    1.492  0.30( 0.30) 0.99    8481.6   50100.00
      6    23528.14   33.07    1.484  0.30( 0.30) 0.99    8618.3   12710.00
      7    24107.74   37.26    1.401  0.30( 0.30) 0.99   10130.7   31810.00
      8    24593.90   40.94    1.332  0.30( 0.30) 0.99   11526.1   31400.00
      9    25677.79   49.63    1.199  0.30( 0.30) 0.99   14705.4   40100.00
     10    27434.25   59.07    1.081  0.30( 0.30) 0.99   18008.2   11801.00
     11    29667.59   70.00    1.013  0.30( 0.30) 0.99   22535.6   11530.00
     12    30929.15   78.75    0.963  0.30( 0.30) 0.99   27166.8   11910.00
     13    32961.40   88.93    0.906  0.30( 0.30) 0.99   33495.3   11350.00
     14    33550.18   93.69    0.886  0.30( 0.30) 0.99   36668.4   11130.00
     15    33399.50   99.74    0.864  0.30( 0.30) 0.99   39595.5   12300.00
     16    33296.67  103.62    0.850  0.30( 0.30) 0.99   41657.6   11620.00
     17    32971.06  108.44    0.832  0.30( 0.30) 0.99   43856.1   12400.00
     18    32198.02  117.84    0.798  0.30( 0.30) 0.99   47257.6   12201.00
     19    31411.38  125.20    0.779  0.30( 0.30) 0.99   49150.1   12231.00
     20    30587.20  132.56    0.763  0.30( 0.30) 0.99   50704.2   10400.00
     21    29258.02  141.78    0.743  0.30( 0.30) 0.99   52149.4   12010.00
     22    28354.64  147.01    0.731  0.30( 0.30) 0.99   52413.0   10210.00
     23    27795.39  150.91    0.723  0.30( 0.30) 0.99   52558.1   12000.00
     24    24614.10  176.72    0.667  0.30( 0.30) 0.99   53172.6   10100.00
    TOTAL AREA(ACRES) =     53172.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    33550.18  Tc(MIN.) =   93.693
  EFFECTIVE AREA(ACRES) =  36668.37  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53172.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12901.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    234.00  DOWNSTREAM(FEET) =    216.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2009.32   CHANNEL SLOPE =  0.0090
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.17
  CHANNEL FLOW THRU SUBAREA(CFS) =   33550.18
  FLOW VELOCITY(FEET/SEC.) =  17.06   FLOW DEPTH(FEET) =   8.17
  TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =   95.66
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1    18148.13   13.27    2.710  0.30( 0.30) 0.99    2668.1   50200.00
     2    22410.21   30.11    1.543  0.30( 0.30) 0.99    6803.8   50120.00
     3    22477.86   30.74    1.530  0.30( 0.30) 0.99    6950.7   40500.00
     4    22631.38   31.39    1.517  0.30( 0.30) 0.99    7192.3   50150.00
     5    23436.08   34.90    1.448  0.30( 0.30) 0.99    8481.6   50100.00
     6    23528.14   35.28    1.440  0.30( 0.30) 0.99    8618.3   12710.00
     7    24107.74   39.46    1.357  0.30( 0.30) 0.99   10130.7   31810.00
     8    24593.90   43.12    1.298  0.30( 0.30) 0.99   11526.1   31400.00
     9    25677.79   51.78    1.171  0.30( 0.30) 0.99   14705.4   40100.00
    10    27434.25   61.16    1.062  0.30( 0.30) 0.99   18008.2   11801.00
    11    29667.59   72.05    1.001  0.30( 0.30) 0.99   22535.6   11530.00
    12    30929.15   80.77    0.952  0.30( 0.30) 0.99   27166.8   11910.00
    13    32961.40   90.91    0.897  0.30( 0.30) 0.99   33495.3   11350.00
    14    33550.18   95.66    0.879  0.30( 0.30) 0.99   36668.4   11130.00
    15    33399.50  101.71    0.857  0.30( 0.30) 0.99   39595.5   12300.00
    16    33296.67  105.59    0.843  0.30( 0.30) 0.99   41657.6   11620.00
    17    32971.06  110.42    0.825  0.30( 0.30) 0.99   43856.1   12400.00
    18    32198.02  119.83    0.791  0.30( 0.30) 0.99   47257.6   12201.00
    19    31411.38  127.21    0.774  0.30( 0.30) 0.99   49150.1   12231.00
    20    30587.20  134.59    0.758  0.30( 0.30) 0.99   50704.2   10400.00
    21    29258.02  143.83    0.738  0.30( 0.30) 0.99   52149.4   12010.00
    22    28354.64  149.09    0.727  0.30( 0.30) 0.99   52413.0   10210.00
    23    27795.39  153.00    0.718  0.30( 0.30) 0.99   52558.1   12000.00
    24    24614.10  178.90    0.662  0.30( 0.30) 0.99   53172.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   33550.18  Tc(MIN.) =   95.66
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   36668.37

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610312W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1      430.68   30.91  0.30( 0.29) 0.96     385.8   31200.00
    TOTAL AREA(ACRES) =      385.8

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1    18148.13   13.27    2.710  0.30( 0.30) 0.99    2668.1   50200.00
      2    22410.21   30.11    1.543  0.30( 0.30) 0.99    6803.8   50120.00
      3    22477.86   30.74    1.530  0.30( 0.30) 0.99    6950.7   40500.00
      4    22631.38   31.39    1.517  0.30( 0.30) 0.99    7192.3   50150.00
      5    23436.08   34.90    1.448  0.30( 0.30) 0.99    8481.6   50100.00
```



```
      6    23528.14   35.28    1.440  0.30( 0.30) 0.99    8618.3   12710.00
      7    24107.74   39.46    1.357  0.30( 0.30) 0.99   10130.7   31810.00
      8    24593.90   43.12    1.298  0.30( 0.30) 0.99   11526.1   31400.00
      9    25677.79   51.78    1.171  0.30( 0.30) 0.99   14705.4   40100.00
     10    27434.25   61.16    1.062  0.30( 0.30) 0.99   18008.2   11801.00
     11    29667.59   72.05    1.001  0.30( 0.30) 0.99   22535.6   11530.00
     12    30929.15   80.77    0.952  0.30( 0.30) 0.99   27166.8   11910.00
     13    32961.40   90.91    0.897  0.30( 0.30) 0.99   33495.3   11350.00
     14    33550.18   95.66    0.879  0.30( 0.30) 0.99   36668.4   11130.00
     15    33399.50  101.71    0.857  0.30( 0.30) 0.99   39595.5   12300.00
     16    33296.67  105.59    0.843  0.30( 0.30) 0.99   41657.6   11620.00
     17    32971.06  110.42    0.825  0.30( 0.30) 0.99   43856.1   12400.00
     18    32198.02  119.83    0.791  0.30( 0.30) 0.99   47257.6   12201.00
     19    31411.38  127.21    0.774  0.30( 0.30) 0.99   49150.1   12231.00
     20    30587.20  134.59    0.758  0.30( 0.30) 0.99   50704.2   10400.00
     21    29258.02  143.83    0.738  0.30( 0.30) 0.99   52149.4   12010.00
     22    28354.64  149.09    0.727  0.30( 0.30) 0.99   52413.0   10210.00
     23    27795.39  153.00    0.718  0.30( 0.30) 0.99   52558.1   12000.00
     24    24614.10  178.90    0.662  0.30( 0.30) 0.99   53172.6   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1      430.68   30.91    1.527  0.30( 0.29) 0.96     385.8   31200.00
 LONGEST FLOWPATH FROM NODE  31200.00 TO NODE  12901.00 =   11169.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1    18509.45   13.27    2.710  0.30( 0.30) 0.99    2833.7   50200.00
     2    22835.11   30.11    1.543  0.30( 0.30) 0.99    7179.6   50120.00
     3    22907.36   30.74    1.530  0.30( 0.30) 0.99    7334.4   40500.00
     4    22948.18   30.91    1.527  0.30( 0.30) 0.99    7398.8   31200.00
     5    23058.74   31.39    1.517  0.30( 0.30) 0.99    7578.1   50150.00
     6    23839.17   34.90    1.448  0.30( 0.30) 0.99    8867.4   50100.00
     7    23928.62   35.28    1.440  0.30( 0.30) 0.99    9004.1   12710.00
     8    24479.36   39.46    1.357  0.30( 0.30) 0.99   10516.5   31810.00
     9    24945.19   43.12    1.298  0.30( 0.30) 0.99   11911.9   31400.00
    10    25984.86   51.78    1.171  0.30( 0.30) 0.99   15091.2   40100.00
    11    27703.65   61.16    1.062  0.30( 0.30) 0.99   18393.9   11801.00
    12    29915.70   72.05    1.001  0.30( 0.30) 0.99   22921.4   11530.00
    13    31160.20   80.77    0.952  0.30( 0.30) 0.99   27552.6   11910.00
    14    33173.25   90.91    0.897  0.30( 0.30) 0.99   33881.0   11350.00
    15    33755.98   95.66    0.879  0.30( 0.30) 0.99   37054.1   11130.00
    16    33597.59  101.71    0.857  0.30( 0.30) 0.99   39981.3   12300.00
    17    33489.83  105.59    0.843  0.30( 0.30) 0.99   42043.3   11620.00
    18    33158.07  110.42    0.825  0.30( 0.30) 0.99   44241.9   12400.00
    19    32373.04  119.83    0.791  0.30( 0.30) 0.99   47643.3   12201.00
    20    31580.76  127.21    0.774  0.30( 0.30) 0.99   49535.9   12231.00
    21    30751.04  134.59    0.758  0.30( 0.30) 0.99   51089.9   10400.00
    22    29414.90  143.83    0.738  0.30( 0.30) 0.99   52535.2   12010.00
    23    28507.56  149.09    0.727  0.30( 0.30) 0.99   52798.8   10210.00
    24    27945.37  153.00    0.718  0.30( 0.30) 0.99   52943.9   12000.00
    25    24744.60  178.90    0.662  0.30( 0.30) 0.99   53558.4   10100.00
  TOTAL AREA(ACRES) =     53558.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

PEAK FLOW RATE(CFS) = 33755.98 Tc(MIN.) = 95.656
EFFECTIVE AREA(ACRES) = 37054.14 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53558.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

```
****************************************************************************
```
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 12
```
----------------------------------------------------------------------------
```
>>>>>CLEAR MEMORY BANK # 3 <<<<<
```
============================================================================
```

****
```
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1
```

```
>>>>>DEFINE MEMORY BANK # 3 <<<<<
```
==
PEAK FLOWRATE TABLE FILE NAME: 0610503W.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	498.63	24.04	0.30(0.30)	0.99	366.1	50300.00

TOTAL AREA(ACRES) = 366.1

```
****************************************************************************
```
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11
```
----------------------------------------------------------------------------
```
>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
```
============================================================================
```

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18509.45	13.27	2.710	0.30(0.30)	0.99	2833.7	50200.00
2	22835.11	30.11	1.543	0.30(0.30)	0.99	7179.6	50120.00
3	22907.36	30.74	1.530	0.30(0.30)	0.99	7334.4	40500.00
4	22948.18	30.91	1.527	0.30(0.30)	0.99	7398.8	31200.00
5	23058.74	31.39	1.517	0.30(0.30)	0.99	7578.1	50150.00
6	23839.17	34.90	1.448	0.30(0.30)	0.99	8867.4	50100.00
7	23928.62	35.28	1.440	0.30(0.30)	0.99	9004.1	12710.00
8	24479.36	39.46	1.357	0.30(0.30)	0.99	10516.5	31810.00
9	24945.19	43.12	1.298	0.30(0.30)	0.99	11911.9	31400.00
10	25984.86	51.78	1.171	0.30(0.30)	0.99	15091.2	40100.00
11	27703.65	61.16	1.062	0.30(0.30)	0.99	18393.9	11801.00
12	29915.70	72.05	1.001	0.30(0.30)	0.99	22921.4	11530.00
13	31160.20	80.77	0.952	0.30(0.30)	0.99	27552.6	11910.00
14	33173.25	90.91	0.897	0.30(0.30)	0.99	33881.0	11350.00
15	33755.98	95.66	0.879	0.30(0.30)	0.99	37054.1	11130.00
16	33597.59	101.71	0.857	0.30(0.30)	0.99	39981.3	12300.00
17	33489.83	105.59	0.843	0.30(0.30)	0.99	42043.3	11620.00
18	33158.07	110.42	0.825	0.30(0.30)	0.99	44241.9	12400.00
19	32373.04	119.83	0.791	0.30(0.30)	0.99	47643.3	12201.00
20	31580.76	127.21	0.774	0.30(0.30)	0.99	49535.9	12231.00
21	30751.04	134.59	0.758	0.30(0.30)	0.99	51089.9	10400.00
22	29414.90	143.83	0.738	0.30(0.30)	0.99	52535.2	12010.00
23	28507.56	149.09	0.727	0.30(0.30)	0.99	52798.8	10210.00
24	27945.37	153.00	0.718	0.30(0.30)	0.99	52943.9	12000.00
25	24744.60	178.90	0.662	0.30(0.30)	0.99	53558.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	498.63	24.04	1.812	0.30(0.30)	0.99	366.1	50300.00

LONGEST FLOWPATH FROM NODE 50300.00 TO NODE 12901.00 = 8614.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18948.03	13.27	2.710	0.30(0.30)	0.99	3035.8	50200.00
2	21776.01	24.04	1.812	0.30(0.30)	0.99	5980.7	50300.00
3	23245.25	30.11	1.543	0.30(0.30)	0.99	7545.7	50120.00
4	23313.35	30.74	1.530	0.30(0.30)	0.99	7700.5	40500.00
5	23353.07	30.91	1.527	0.30(0.30)	0.99	7764.9	31200.00
6	23460.49	31.39	1.517	0.30(0.30)	0.99	7944.2	50150.00
7	24217.89	34.90	1.448	0.30(0.30)	0.99	9233.5	50100.00
8	24304.86	35.28	1.440	0.30(0.30)	0.99	9370.2	12710.00
9	24828.22	39.46	1.357	0.30(0.30)	0.99	10882.6	31810.00
10	25274.78	43.12	1.298	0.30(0.30)	0.99	12278.0	31400.00
11	26272.51	51.78	1.171	0.30(0.30)	0.99	15457.3	40100.00
12	27955.56	61.16	1.062	0.30(0.30)	0.99	18760.1	11801.00
13	30147.41	72.05	1.001	0.30(0.30)	0.99	23287.5	11530.00
14	31375.74	80.77	0.952	0.30(0.30)	0.99	27918.7	11910.00
15	33370.56	90.91	0.897	0.30(0.30)	0.99	34247.2	11350.00
16	33947.55	95.66	0.879	0.30(0.30)	0.99	37420.3	11130.00
17	33781.87	101.71	0.857	0.30(0.30)	0.99	40347.4	12300.00
18	33669.41	105.59	0.843	0.30(0.30)	0.99	42409.5	11620.00
19	33331.82	110.42	0.825	0.30(0.30)	0.99	44608.0	12400.00
20	32535.43	119.83	0.791	0.30(0.30)	0.99	48009.4	12201.00
21	31737.80	127.21	0.774	0.30(0.30)	0.99	49902.0	12231.00
22	30902.82	134.59	0.758	0.30(0.30)	0.99	51456.1	10400.00
23	29560.08	143.83	0.738	0.30(0.30)	0.99	52901.3	12010.00
24	28648.99	149.09	0.727	0.30(0.30)	0.99	53164.9	10210.00
25	28084.00	153.00	0.718	0.30(0.30)	0.99	53310.0	12000.00
26	24864.75	178.90	0.662	0.30(0.30)	0.99	53924.5	10100.00

TOTAL AREA(ACRES) = 53924.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 33947.55 Tc(MIN.) = 95.656
EFFECTIVE AREA(ACRES) = 37420.26 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53924.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

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FLOW PROCESS FROM NODE 12901.00 TO NODE 12902.00 IS CODE = 56
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----------------------------------------------------------------------------
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>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
```
============================================================================
ELEVATION DATA: UPSTREAM(FEET) = 216.00 DOWNSTREAM(FEET) = 215.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 122.04 CHANNEL SLOPE = 0.0082
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.43
CHANNEL FLOW THRU SUBAREA(CFS) = 33947.55
```

FLOW VELOCITY(FEET/SEC.) = 16.62 FLOW DEPTH(FEET) = 8.43
TRAVEL TIME(MIN.) = 0.12 Tc(MIN.) = 95.78
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12902.00 = 115038.03 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18948.03	13.42	2.688	0.30(0.30)	0.99	3035.8	50200.00
2	21776.01	24.19	1.804	0.30(0.30)	0.99	5980.7	50300.00
3	23245.25	30.24	1.540	0.30(0.30)	0.99	7545.7	50120.00
4	23313.35	30.88	1.528	0.30(0.30)	0.99	7700.5	40500.00
5	23353.07	31.05	1.524	0.30(0.30)	0.99	7764.9	31200.00
6	23460.49	31.52	1.515	0.30(0.30)	0.99	7944.2	50150.00
7	24217.89	35.04	1.445	0.30(0.30)	0.99	9233.5	50100.00
8	24304.86	35.41	1.437	0.30(0.30)	0.99	9370.2	12710.00
9	24828.22	39.59	1.354	0.30(0.30)	0.99	10882.6	31810.00
10	25274.78	43.25	1.296	0.30(0.30)	0.99	12278.0	31400.00
11	26272.51	51.91	1.169	0.30(0.30)	0.99	15457.3	40100.00
12	27955.56	61.30	1.062	0.30(0.30)	0.99	18760.1	11801.00
13	30147.41	72.18	1.000	0.30(0.30)	0.99	23287.5	11530.00
14	31375.74	80.89	0.951	0.30(0.30)	0.99	27918.7	11910.00
15	33370.56	91.03	0.896	0.30(0.30)	0.99	34247.2	11350.00
16	33947.55	95.78	0.879	0.30(0.30)	0.99	37420.3	11130.00
17	33781.87	101.83	0.857	0.30(0.30)	0.99	40347.4	12300.00
18	33669.41	105.71	0.842	0.30(0.30)	0.99	42409.5	11620.00
19	33331.82	110.54	0.825	0.30(0.30)	0.99	44608.0	12400.00
20	32535.43	119.96	0.790	0.30(0.30)	0.99	48009.4	12201.00
21	31737.80	127.34	0.774	0.30(0.30)	0.99	49902.0	12231.00
22	30902.82	134.71	0.758	0.30(0.30)	0.99	51456.1	10400.00
23	29560.08	143.96	0.738	0.30(0.30)	0.99	52901.3	12010.00
24	28648.99	149.22	0.727	0.30(0.30)	0.99	53164.9	10210.00
25	28084.00	153.13	0.718	0.30(0.30)	0.99	53310.0	12000.00
26	24864.75	179.04	0.662	0.30(0.30)	0.99	53924.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 33947.55 Tc(MIN.) = 95.78
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37420.26

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12902.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
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FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 215.00 DOWNSTREAM(FEET) = 214.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 895.53 CHANNEL SLOPE = 0.0011
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 14.71
CHANNEL FLOW THRU SUBAREA(CFS) = 33947.55
FLOW VELOCITY(FEET/SEC.) = 8.43 FLOW DEPTH(FEET) = 14.71
TRAVEL TIME(MIN.) = 1.77 Tc(MIN.) = 97.55

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18948.03	15.55	2.401	0.30(0.30)	0.99	3035.8	50200.00
2	21776.01	26.22	1.709	0.30(0.30)	0.99	5980.7	50300.00
3	23245.25	32.24	1.501	0.30(0.30)	0.99	7545.7	50120.00
4	23313.35	32.87	1.488	0.30(0.30)	0.99	7700.5	40500.00
5	23353.07	33.03	1.485	0.30(0.30)	0.99	7764.9	31200.00
6	23460.49	33.51	1.475	0.30(0.30)	0.99	7944.2	50150.00
7	24217.89	37.00	1.406	0.30(0.30)	0.99	9233.5	50100.00
8	24304.86	37.38	1.398	0.30(0.30)	0.99	9370.2	12710.00
9	24828.22	41.54	1.322	0.30(0.30)	0.99	10882.6	31810.00
10	25274.78	45.19	1.267	0.30(0.30)	0.99	12278.0	31400.00
11	26272.51	53.83	1.146	0.30(0.30)	0.99	15457.3	40100.00
12	27955.56	63.17	1.051	0.30(0.30)	0.99	18760.1	11801.00
13	30147.41	74.01	0.990	0.30(0.30)	0.99	23287.5	11530.00
14	31375.74	82.71	0.941	0.30(0.30)	0.99	27918.7	11910.00
15	33370.56	92.81	0.890	0.30(0.30)	0.99	34247.2	11350.00
16	33947.55	97.55	0.872	0.30(0.30)	0.99	37420.3	11130.00
17	33781.87	103.60	0.850	0.30(0.30)	0.99	40347.4	12300.00
18	33669.41	107.49	0.836	0.30(0.30)	0.99	42409.5	11620.00
19	33331.82	112.32	0.818	0.30(0.30)	0.99	44608.0	12400.00
20	32535.43	121.75	0.786	0.30(0.30)	0.99	48009.4	12201.00
21	31737.80	129.14	0.770	0.30(0.30)	0.99	49902.0	12231.00
22	30902.82	136.53	0.754	0.30(0.30)	0.99	51456.1	10400.00
23	29560.08	145.81	0.734	0.30(0.30)	0.99	52901.3	12010.00
24	28648.99	151.09	0.723	0.30(0.30)	0.99	53164.9	10210.00
25	28084.00	155.01	0.714	0.30(0.30)	0.99	53310.0	12000.00
26	24864.75	180.99	0.659	0.30(0.30)	0.99	53924.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 33947.55 Tc(MIN.) = 97.55
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37420.26

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
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****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610504W.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	127.90	16.68	0.30(0.29)	0.97	70.7	50400.00

TOTAL AREA(ACRES) = 70.7

****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18948.03	15.55	2.401	0.30(0.30)	0.99	3035.8	50200.00
2	21776.01	26.22	1.709	0.30(0.30)	0.99	5980.7	50300.00
3	23245.25	32.24	1.501	0.30(0.30)	0.99	7545.7	50120.00
4	23313.35	32.87	1.488	0.30(0.30)	0.99	7700.5	40500.00
5	23353.07	33.03	1.485	0.30(0.30)	0.99	7764.9	31200.00
6	23460.49	33.51	1.475	0.30(0.30)	0.99	7944.2	50150.00
7	24217.89	37.00	1.406	0.30(0.30)	0.99	9233.5	50100.00
8	24304.86	37.38	1.398	0.30(0.30)	0.99	9370.2	12710.00
9	24828.22	41.54	1.322	0.30(0.30)	0.99	10882.6	31810.00
10	25274.78	45.19	1.267	0.30(0.30)	0.99	12278.0	31400.00
11	26272.51	53.83	1.146	0.30(0.30)	0.99	15457.3	40100.00
12	27955.56	63.17	1.051	0.30(0.30)	0.99	18760.1	11801.00
13	30147.41	74.01	0.990	0.30(0.30)	0.99	23287.5	11530.00
14	31375.74	82.71	0.941	0.30(0.30)	0.99	27918.7	11910.00
15	33370.56	92.81	0.890	0.30(0.30)	0.99	34247.2	11350.00
16	33947.55	97.55	0.872	0.30(0.30)	0.99	37420.3	11130.00
17	33781.87	103.60	0.850	0.30(0.30)	0.99	40347.4	12300.00
18	33669.41	107.49	0.836	0.30(0.30)	0.99	42409.5	11620.00
19	33331.82	112.32	0.818	0.30(0.30)	0.99	44608.0	12400.00
20	32535.43	121.75	0.786	0.30(0.30)	0.99	48009.4	12201.00
21	31737.80	129.14	0.770	0.30(0.30)	0.99	49902.0	12231.00
22	30902.82	136.53	0.754	0.30(0.30)	0.99	51456.1	10400.00
23	29560.08	145.81	0.734	0.30(0.30)	0.99	52901.3	12010.00
24	28648.99	151.09	0.723	0.30(0.30)	0.99	53164.9	10210.00
25	28084.00	155.01	0.714	0.30(0.30)	0.99	53310.0	12000.00
26	24864.75	180.99	0.659	0.30(0.30)	0.99	53924.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	127.90	16.68	2.304	0.30(0.29)	0.97	70.7	50400.00

LONGEST FLOWPATH FROM NODE 50400.00 TO NODE 12903.00 = 3607.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19072.95	15.55	2.401	0.30(0.30)	0.99	3101.6	50200.00
2	19377.39	16.68	2.304	0.30(0.30)	0.99	3420.4	50400.00
3	21866.10	26.22	1.709	0.30(0.30)	0.99	6051.4	50300.00
4	23322.08	32.24	1.501	0.30(0.30)	0.99	7616.4	50120.00
5	23389.38	32.87	1.488	0.30(0.30)	0.99	7771.1	40500.00
6	23428.89	33.03	1.485	0.30(0.30)	0.99	7835.6	31200.00
7	23535.71	33.51	1.475	0.30(0.30)	0.99	8014.8	50150.00
8	24288.69	37.00	1.406	0.30(0.30)	0.99	9304.1	50100.00
9	24375.18	37.38	1.398	0.30(0.30)	0.99	9440.9	12710.00
10	24893.73	41.54	1.322	0.30(0.30)	0.99	10953.3	31810.00
11	25336.73	45.19	1.267	0.30(0.30)	0.99	12348.7	31400.00
12	26326.77	53.83	1.146	0.30(0.30)	0.99	15528.0	40100.00
13	28003.81	63.17	1.051	0.30(0.30)	0.99	18830.7	11801.00
14	30191.78	74.01	0.990	0.30(0.30)	0.99	23358.2	11530.00
15	31416.99	82.71	0.941	0.30(0.30)	0.99	27989.4	11910.00
16	33408.55	92.81	0.890	0.30(0.30)	0.99	34317.8	11350.00

17	33984.44	97.55	0.872	0.30(0.30)	0.99	37490.9	11130.00
18	33817.34	103.60	0.850	0.30(0.30)	0.99	40418.1	12300.00
19	33703.98	107.49	0.836	0.30(0.30)	0.99	42480.1	11620.00
20	33365.26	112.32	0.818	0.30(0.30)	0.99	44678.7	12400.00
21	32566.84	121.75	0.786	0.30(0.30)	0.99	48080.1	12201.00
22	31768.19	129.14	0.770	0.30(0.30)	0.99	49972.7	12231.00
23	30932.19	136.53	0.754	0.30(0.30)	0.99	51526.7	10400.00
24	29588.17	145.81	0.734	0.30(0.30)	0.99	52972.0	12010.00
25	28676.35	151.09	0.723	0.30(0.30)	0.99	53235.6	10210.00
26	28110.83	155.01	0.714	0.30(0.30)	0.99	53380.7	12000.00
27	24888.07	180.99	0.659	0.30(0.30)	0.99	53995.2	10100.00

TOTAL AREA(ACRES) = 53995.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 33984.44 Tc(MIN.) = 97.549
EFFECTIVE AREA(ACRES) = 37490.94 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53995.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12904.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 214.00 DOWNSTREAM(FEET) = 213.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 767.57 CHANNEL SLOPE = 0.0013
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 14.11
CHANNEL FLOW THRU SUBAREA(CFS) = 33984.44
FLOW VELOCITY(FEET/SEC.) = 8.90 FLOW DEPTH(FEET) = 14.11
TRAVEL TIME(MIN.) = 1.44 Tc(MIN.) = 98.99
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19072.95	17.27	2.254	0.30(0.30)	0.99	3101.6	50200.00
2	19377.39	18.40	2.157	0.30(0.30)	0.99	3420.4	50400.00
3	21866.10	27.87	1.637	0.30(0.30)	0.99	6051.4	50300.00
4	23322.08	33.85	1.468	0.30(0.30)	0.99	7616.4	50120.00
5	23389.38	34.48	1.456	0.30(0.30)	0.99	7771.1	40500.00
6	23428.89	34.65	1.452	0.30(0.30)	0.99	7835.6	31200.00
7	23535.71	35.12	1.443	0.30(0.30)	0.99	8014.8	50150.00
8	24288.69	38.60	1.374	0.30(0.30)	0.99	9304.1	50100.00
9	24375.18	38.97	1.366	0.30(0.30)	0.99	9440.9	12710.00
10	24893.73	43.13	1.298	0.30(0.30)	0.99	10953.3	31810.00
11	25336.73	46.77	1.242	0.30(0.30)	0.99	12348.7	31400.00
12	26326.77	55.38	1.126	0.30(0.30)	0.99	15528.0	40100.00
13	28003.81	64.70	1.043	0.30(0.30)	0.99	18830.7	11801.00
14	30191.78	75.50	0.982	0.30(0.30)	0.99	23358.2	11530.00
15	31416.99	84.18	0.933	0.30(0.30)	0.99	27989.4	11910.00
16	33408.55	94.26	0.884	0.30(0.30)	0.99	34317.8	11350.00
17	33984.44	98.99	0.867	0.30(0.30)	0.99	37490.9	11130.00
18	33817.34	105.04	0.845	0.30(0.30)	0.99	40418.1	12300.00
19	33703.98	108.93	0.831	0.30(0.30)	0.99	42480.1	11620.00

```
    20    33365.26  113.77    0.813  0.30( 0.30) 0.99   44678.7   12400.00
    21    32566.84  123.21    0.783  0.30( 0.30) 0.99   48080.1   12201.00
    22    31768.19  130.61    0.767  0.30( 0.30) 0.99   49972.7   12231.00
    23    30932.19  138.01    0.751  0.30( 0.30) 0.99   51526.7   10400.00
    24    29588.17  147.31    0.731  0.30( 0.30) 0.99   52972.0   12010.00
    25    28676.35  152.60    0.719  0.30( 0.30) 0.99   53235.6   10210.00
    26    28110.83  156.54    0.711  0.30( 0.30) 0.99   53380.7   12000.00
    27    24888.07  182.57    0.658  0.30( 0.30) 0.99   53995.2   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   33984.44  Tc(MIN.) =   98.99
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   37490.94

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610311W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      138.54   28.01  0.30( 0.29) 0.97     114.8   31100.00
    TOTAL AREA(ACRES) =      114.8

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19072.95   17.27    2.254  0.30( 0.30) 0.99    3101.6   50200.00
      2    19377.39   18.40    2.157  0.30( 0.30) 0.99    3420.4   50400.00
      3    21866.10   27.87    1.637  0.30( 0.30) 0.99    6051.4   50300.00
      4    23322.08   33.85    1.468  0.30( 0.30) 0.99    7616.4   50120.00
      5    23389.38   34.48    1.456  0.30( 0.30) 0.99    7771.1   40500.00
      6    23428.89   34.65    1.452  0.30( 0.30) 0.99    7835.6   31200.00
      7    23535.71   35.12    1.443  0.30( 0.30) 0.99    8014.8   50150.00
      8    24288.69   38.60    1.374  0.30( 0.30) 0.99    9304.1   50100.00
      9    24375.18   38.97    1.366  0.30( 0.30) 0.99    9440.9   12710.00
     10    24893.73   43.13    1.298  0.30( 0.30) 0.99   10953.3   31810.00
     11    25336.73   46.77    1.242  0.30( 0.30) 0.99   12348.7   31400.00
     12    26326.77   55.38    1.126  0.30( 0.30) 0.99   15528.0   40100.00
     13    28003.81   64.70    1.043  0.30( 0.30) 0.99   18830.7   11801.00
     14    30191.78   75.50    0.982  0.30( 0.30) 0.99   23358.2   11530.00
     15    31416.99   84.18    0.933  0.30( 0.30) 0.99   27989.4   11910.00
     16    33408.55   94.26    0.884  0.30( 0.30) 0.99   34317.8   11350.00
     17    33984.44   98.99    0.867  0.30( 0.30) 0.99   37490.9   11130.00
     18    33817.34  105.04    0.845  0.30( 0.30) 0.99   40418.1   12300.00
```



```
    19    33703.98  108.93    0.831  0.30( 0.30) 0.99   42480.1   11620.00
    20    33365.26  113.77    0.813  0.30( 0.30) 0.99   44678.7   12400.00
    21    32566.84  123.21    0.783  0.30( 0.30) 0.99   48080.1   12201.00
    22    31768.19  130.61    0.767  0.30( 0.30) 0.99   49972.7   12231.00
    23    30932.19  138.01    0.751  0.30( 0.30) 0.99   51526.7   10400.00
    24    29588.17  147.31    0.731  0.30( 0.30) 0.99   52972.0   12010.00
    25    28676.35  152.60    0.719  0.30( 0.30) 0.99   53235.6   10210.00
    26    28110.83  156.54    0.711  0.30( 0.30) 0.99   53380.7   12000.00
    27    24888.07  182.57    0.658  0.30( 0.30) 0.99   53995.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12904.00 =  116701.13 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      138.54   28.01    1.631  0.30( 0.29) 0.97     114.8   31100.00
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  12904.00 =    6503.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19197.99   17.27    2.254  0.30( 0.30) 0.99    3172.4   50200.00
      2    19504.09   18.40    2.157  0.30( 0.30) 0.99    3495.8   50400.00
      3    22004.57   27.87    1.637  0.30( 0.30) 0.99    6165.6   50300.00
      4    22039.21   28.01    1.631  0.30( 0.30) 0.99    6203.3   31100.00
      5    23443.78   33.85    1.468  0.30( 0.30) 0.99    7731.2   50120.00
      6    23509.78   34.48    1.456  0.30( 0.30) 0.99    7886.0   40500.00
      7    23548.96   34.65    1.452  0.30( 0.30) 0.99    7950.4   31200.00
      8    23654.80   35.12    1.443  0.30( 0.30) 0.99    8129.7   50150.00
      9    24400.63   38.60    1.374  0.30( 0.30) 0.99    9419.0   50100.00
     10    24486.36   38.97    1.366  0.30( 0.30) 0.99    9555.7   12710.00
     11    24997.85   43.13    1.298  0.30( 0.30) 0.99   11068.1   31810.00
     12    25435.10   46.77    1.242  0.30( 0.30) 0.99   12463.5   31400.00
     13    26413.13   55.38    1.126  0.30( 0.30) 0.99   15642.8   40100.00
     14    28081.52   64.70    1.043  0.30( 0.30) 0.99   18945.5   11801.00
     15    30263.21   75.50    0.982  0.30( 0.30) 0.99   23473.0   11530.00
     16    31483.37   84.18    0.933  0.30( 0.30) 0.99   28104.2   11910.00
     17    33469.92   94.26    0.884  0.30( 0.30) 0.99   34432.6   11350.00
     18    34044.02   98.99    0.867  0.30( 0.30) 0.99   37605.8   11130.00
     19    33874.63  105.04    0.845  0.30( 0.30) 0.99   40532.9   12300.00
     20    33759.80  108.93    0.831  0.30( 0.30) 0.99   42595.0   11620.00
     21    33419.25  113.77    0.813  0.30( 0.30) 0.99   44793.5   12400.00
     22    32617.75  123.21    0.783  0.30( 0.30) 0.99   48194.9   12201.00
     23    31817.43  130.61    0.767  0.30( 0.30) 0.99   50087.5   12231.00
     24    30979.78  138.01    0.751  0.30( 0.30) 0.99   51641.5   10400.00
     25    29633.68  147.31    0.731  0.30( 0.30) 0.99   53086.8   12010.00
     26    28720.68  152.60    0.719  0.30( 0.30) 0.99   53350.4   10210.00
     27    28154.27  156.54    0.711  0.30( 0.30) 0.99   53495.5   12000.00
     28    24926.01  182.57    0.658  0.30( 0.30) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =     54110.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    34044.02  Tc(MIN.) =   98.986
  EFFECTIVE AREA(ACRES) =  37605.75  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    54110.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12904.00 =  116701.13 FEET.
============================================================================
  END OF STUDY SUMMARY:
```

TOTAL AREA(ACRES) = 54110.0 TC(MIN.) = 98.99
EFFECTIVE AREA(ACRES) = 37605.75 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.993
PEAK FLOW RATE(CFS) = 34044.02

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19197.99	17.27	2.254	0.30(0.30)	0.99	3172.4	50200.00
2	19504.09	18.40	2.157	0.30(0.30)	0.99	3495.8	50400.00
3	22004.57	27.87	1.637	0.30(0.30)	0.99	6165.6	50300.00
4	22039.21	28.01	1.631	0.30(0.30)	0.99	6203.3	31100.00
5	23443.78	33.85	1.468	0.30(0.30)	0.99	7731.2	50120.00
6	23509.78	34.48	1.456	0.30(0.30)	0.99	7886.0	40500.00
7	23548.96	34.65	1.452	0.30(0.30)	0.99	7950.4	31200.00
8	23654.80	35.12	1.443	0.30(0.30)	0.99	8129.7	50150.00
9	24400.63	38.60	1.374	0.30(0.30)	0.99	9419.0	50100.00
10	24486.36	38.97	1.366	0.30(0.30)	0.99	9555.7	12710.00
11	24997.85	43.13	1.298	0.30(0.30)	0.99	11068.1	31810.00
12	25435.10	46.77	1.242	0.30(0.30)	0.99	12463.5	31400.00
13	26413.13	55.38	1.126	0.30(0.30)	0.99	15642.8	40100.00
14	28081.52	64.70	1.043	0.30(0.30)	0.99	18945.5	11801.00
15	30263.21	75.50	0.982	0.30(0.30)	0.99	23473.0	11530.00
16	31483.37	84.18	0.933	0.30(0.30)	0.99	28104.2	11910.00
17	33469.92	94.26	0.884	0.30(0.30)	0.99	34432.6	11350.00
18	34044.02	98.99	0.867	0.30(0.30)	0.99	37605.8	11130.00
19	33874.63	105.04	0.845	0.30(0.30)	0.99	40532.9	12300.00
20	33759.80	108.93	0.831	0.30(0.30)	0.99	42595.0	11620.00
21	33419.25	113.77	0.813	0.30(0.30)	0.99	44793.5	12400.00
22	32617.75	123.21	0.783	0.30(0.30)	0.99	48194.9	12201.00
23	31817.43	130.61	0.767	0.30(0.30)	0.99	50087.5	12231.00
24	30979.78	138.01	0.751	0.30(0.30)	0.99	51641.5	10400.00
25	29633.68	147.31	0.731	0.30(0.30)	0.99	53086.8	12010.00
26	28720.68	152.60	0.719	0.30(0.30)	0.99	53350.4	10210.00
27	28154.27	156.54	0.711	0.30(0.30)	0.99	53495.5	12000.00
28	24926.01	182.57	0.658	0.30(0.30)	0.99	54110.0	10100.00

==========
==========
END OF RATIONAL METHOD ANALYSIS

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************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S30.DAT
  TIME/DATE OF STUDY: 13:30 04/03/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.080
   2)   10.00;  2.729
   3)   15.00;  2.163
   4)   20.00;  1.834
   5)   25.00;  1.614
   6)   30.00;  1.440
   7)   40.00;  1.233
   8)   50.00;  1.085
   9)   60.00;  0.950
  10)   90.00;  0.775
  11)  120.00;  0.657
  12)  180.00;  0.530
  13)  360.00;  0.367
  14) 1440.00;  0.153
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  13000.00 TO NODE  13001.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   279.24
  ELEVATION DATA: UPSTREAM(FEET) =   1187.54  DOWNSTREAM(FEET) =   1104.45

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.560
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.118
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.65      0.30     1.000     0    8.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.65
  TOTAL AREA(ACRES) =      0.65   PEAK FLOW RATE(CFS) =      1.65

************************************************************************
  FLOW PROCESS FROM NODE  13001.00 TO NODE  13002.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1104.45  DOWNSTREAM(FEET) =   1034.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   736.73   CHANNEL SLOPE =  0.0945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.688
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       19.74      0.30     0.968     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.968
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.82
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =   10.36
  SUBAREA AREA(ACRES) =    19.74       SUBAREA RUNOFF(CFS) =   42.60
  EFFECTIVE AREA(ACRES) =     20.39     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =       20.4          PEAK FLOW RATE(CFS) =      44.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.47   FLOW VELOCITY(FEET/SEC.) =   8.59
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13002.00 =    1015.97 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  13002.00 TO NODE  13003.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1034.82  DOWNSTREAM(FEET) =    986.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1305.95   CHANNEL SLOPE =  0.0368
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.415
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.90      0.30     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     125.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.02
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   2.41
  Tc(MIN.) =   12.77
  SUBAREA AREA(ACRES) =    83.90       SUBAREA RUNOFF(CFS) =  161.88
  EFFECTIVE AREA(ACRES) =    104.29     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =      104.3         PEAK FLOW RATE(CFS) =     200.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =  10.45
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13003.00 =    2321.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13003.00 TO NODE  13004.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    986.71  DOWNSTREAM(FEET) =    939.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.54   CHANNEL SLOPE =  0.0361
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.189
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.30     0.871     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.871
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     242.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.01
  AVERAGE FLOW DEPTH(FEET) =   1.65   TRAVEL TIME(MIN.) =   2.00
  Tc(MIN.) =   14.77
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   82.30
  EFFECTIVE AREA(ACRES) =    151.73     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =     261.95
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.73   FLOW VELOCITY(FEET/SEC.) =  11.27
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13004.00 =    3640.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.06  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1954.61   CHANNEL SLOPE =  0.0397
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.91
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.005
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       77.87      0.30     0.856     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.856
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     323.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.42
  AVERAGE FLOW DEPTH(FEET) =   1.89   TRAVEL TIME(MIN.) =   2.62
  Tc(MIN.) =   17.39
  SUBAREA AREA(ACRES) =    77.87       SUBAREA RUNOFF(CFS) =  122.56
  EFFECTIVE AREA(ACRES) =    229.60     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =      229.6         PEAK FLOW RATE(CFS) =     359.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.00   FLOW VELOCITY(FEET/SEC.) =  12.81
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13020.00 =    5595.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.39
  RAINFALL INTENSITY(INCH/HR) =   2.01
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     229.60
  TOTAL STREAM AREA(ACRES) =     229.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     359.45
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13010.00 TO NODE  13011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   284.64
  ELEVATION DATA: UPSTREAM(FEET) =   1190.91  DOWNSTREAM(FEET) =   1110.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.716
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.076
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BROWSH"                -        0.91      0.30     1.000     0    8.72
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.27
  TOTAL AREA(ACRES) =      0.91   PEAK FLOW RATE(CFS) =      2.27

****************************************************************************
  FLOW PROCESS FROM NODE  13011.00 TO NODE  13012.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1110.50  DOWNSTREAM ELEVATION(FEET) = 1068.16
  STREET LENGTH(FEET) =   581.12   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.56
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   10.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.97
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.06
  STREET FLOW TRAVEL TIME(MIN.) =   1.62   Tc(MIN.) =   10.34
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.691
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                 -       10.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   10.46      SUBAREA RUNOFF(CFS) =   22.51
  EFFECTIVE AREA(ACRES) =     11.37    AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
```



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  TOTAL AREA(ACRES) =       11.4        PEAK FLOW RATE(CFS) =      24.46

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.32
  FLOW VELOCITY(FEET/SEC.) =  6.88   DEPTH*VELOCITY(FT*FT/SEC.) =   2.75
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13012.00 =     865.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13012.00 TO NODE  13013.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1068.16  DOWNSTREAM ELEVATION(FEET) =  994.58
  STREET LENGTH(FEET) =  1505.98   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.93
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.53
    HALFSTREET FLOOD WIDTH(FEET) =   20.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.79
  STREET FLOW TRAVEL TIME(MIN.) =   3.51   Tc(MIN.) =   13.85
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.293
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                 -       35.49      0.30     0.901     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.901
  SUBAREA AREA(ACRES) =   35.49      SUBAREA RUNOFF(CFS) =   64.62
  EFFECTIVE AREA(ACRES) =     46.86    AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.93
  TOTAL AREA(ACRES) =       46.9        PEAK FLOW RATE(CFS) =      85.02

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  24.10
  FLOW VELOCITY(FEET/SEC.) =  7.90   DEPTH*VELOCITY(FT*FT/SEC.) =   4.68
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13013.00 =    2371.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13013.00 TO NODE  13014.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    994.58  DOWNSTREAM(FEET) =    944.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1798.86   CHANNEL SLOPE =  0.0276
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.37
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.009
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.31      0.30     0.616     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.616
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     145.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.57
  AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   3.50
  Tc(MIN.) =   17.35
  SUBAREA AREA(ACRES) =    73.31       SUBAREA RUNOFF(CFS) =  120.33
  EFFECTIVE AREA(ACRES) =    120.17     AREA-AVERAGED Fm(INCH/HR) =   0.22
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.74
  TOTAL AREA(ACRES) =      120.2         PEAK FLOW RATE(CFS) =     193.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.57   FLOW VELOCITY(FEET/SEC.) =   9.34
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13014.00 =    4170.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    944.96  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1519.40   CHANNEL SLOPE =  0.0549
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.52
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.879
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.22      0.30     0.810     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.810
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     252.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.88
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   1.97
  Tc(MIN.) =   19.31
  SUBAREA AREA(ACRES) =    80.22       SUBAREA RUNOFF(CFS) =  118.14
  EFFECTIVE AREA(ACRES) =    200.39     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      200.4         PEAK FLOW RATE(CFS) =     297.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.65   FLOW VELOCITY(FEET/SEC.) =  13.55
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  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.31
  RAINFALL INTENSITY(INCH/HR) =   1.88
  AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.77
  EFFECTIVE STREAM AREA(ACRES) =     200.39
  TOTAL STREAM AREA(ACRES) =     200.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     297.49

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      359.45   17.39    2.005  0.30( 0.27) 0.89     229.6   13000.00
      2      297.49   19.31    1.879  0.30( 0.23) 0.77     200.4   13010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      647.89   17.39    2.005  0.30( 0.25) 0.83     410.1   13000.00
      2      630.85   19.31    1.879  0.30( 0.25) 0.83     430.0   13010.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     647.89    Tc(MIN.) =    17.39
  EFFECTIVE AREA(ACRES) =     410.08   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =      430.0
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13020.00 TO NODE  13021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    861.53  DOWNSTREAM(FEET) =    843.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1274.71   CHANNEL SLOPE =  0.0139
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.827
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.78      0.30     0.818     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.818
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     705.41
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.70
 AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   2.76
 Tc(MIN.) =   20.15
 SUBAREA AREA(ACRES) =    80.78       SUBAREA RUNOFF(CFS) =  115.01
 EFFECTIVE AREA(ACRES) =    490.86     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =      510.8         PEAK FLOW RATE(CFS) =     697.12
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.65

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.65   FLOW VELOCITY(FEET/SEC.) =   7.67
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13021.00 =    6964.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      697.12   20.15    1.827  0.30( 0.25) 0.83     490.9   13000.00
     2      686.37   22.10    1.742  0.30( 0.25) 0.83     510.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     697.12  Tc(MIN.) =   20.15
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     490.86

****************************************************************************
 FLOW PROCESS FROM NODE  13021.00 TO NODE  13022.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    843.84  DOWNSTREAM(FEET) =    842.14
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1448.62   CHANNEL SLOPE =  0.0012
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.63
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.545
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      124.44      0.30     0.803     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.803
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     770.22
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.53
 AVERAGE FLOW DEPTH(FEET) =   3.59   TRAVEL TIME(MIN.) =   6.84
 Tc(MIN.) =   26.99
 SUBAREA AREA(ACRES) =   124.44       SUBAREA RUNOFF(CFS) =  146.02
 EFFECTIVE AREA(ACRES) =    615.30     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =      635.2         PEAK FLOW RATE(CFS) =     718.28
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.45

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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```
 DEPTH(FEET) =  3.45   FLOW VELOCITY(FEET/SEC.) =   3.45
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13022.00 =    8413.33 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      718.28   26.99    1.545  0.30( 0.25) 0.83     615.3   13000.00
     2      702.30   28.98    1.475  0.30( 0.25) 0.82     635.2   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     718.28  Tc(MIN.) =   26.99
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     615.30

****************************************************************************
 FLOW PROCESS FROM NODE  13022.00 TO NODE  13023.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    842.14  DOWNSTREAM(FEET) =    806.85
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.95   CHANNEL SLOPE =  0.0246
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.64
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.462
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      324.46      0.30     0.786     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.786
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     897.38
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.08
 AVERAGE FLOW DEPTH(FEET) =   1.62   TRAVEL TIME(MIN.) =   2.37
 Tc(MIN.) =   29.36
 SUBAREA AREA(ACRES) =   324.46       SUBAREA RUNOFF(CFS) =  358.14
 EFFECTIVE AREA(ACRES) =    939.76     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =      959.7         PEAK FLOW RATE(CFS) =    1030.77
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.76

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.76   FLOW VELOCITY(FEET/SEC.) =  10.60
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13023.00 =    9846.28 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1030.77   29.36    1.462  0.30( 0.24) 0.81     939.8   13000.00
     2     1009.14   31.37    1.412  0.30( 0.24) 0.81     959.7   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1030.77  Tc(MIN.) =   29.36
 AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =     939.76

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```
 FLOW PROCESS FROM NODE  13023.00 TO NODE  13024.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    806.85  DOWNSTREAM(FEET) =    767.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =   940.17   CHANNEL SLOPE =  0.0423
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.67
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.429
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      367.12      0.30     0.795     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.795
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1227.46
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.40
 AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   1.17
 Tc(MIN.) =   30.53
 SUBAREA AREA(ACRES) =   367.12       SUBAREA RUNOFF(CFS) =  393.36
 EFFECTIVE AREA(ACRES) =   1306.88     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     1326.8         PEAK FLOW RATE(CFS) =    1396.05
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.80   FLOW VELOCITY(FEET/SEC.) =  14.04
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13024.00 =   10786.45 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1396.05   30.53    1.429  0.30( 0.24) 0.81    1306.9   13000.00
     2     1367.59   32.55    1.387  0.30( 0.24) 0.81    1326.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1396.05  Tc(MIN.) =   30.53
 AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1306.88

****************************************************************************
 FLOW PROCESS FROM NODE  13024.00 TO NODE  13025.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    767.07  DOWNSTREAM(FEET) =    697.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3026.62   CHANNEL SLOPE =  0.0230
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.342
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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 USER-DEFINED               -      315.24      0.30     0.867     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1549.53
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.97
 AVERAGE FLOW DEPTH(FEET) =   2.28   TRAVEL TIME(MIN.) =   4.22
 Tc(MIN.) =   34.75
 SUBAREA AREA(ACRES) =   315.24       SUBAREA RUNOFF(CFS) =  306.89
 EFFECTIVE AREA(ACRES) =   1622.12     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
 TOTAL AREA(ACRES) =     1642.0         PEAK FLOW RATE(CFS) =    1600.31
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.32   FLOW VELOCITY(FEET/SEC.) =  12.10
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13025.00 =   13813.07 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1600.31   34.75    1.342  0.30( 0.25) 0.82    1622.1   13000.00
     2     1557.46   36.80    1.299  0.30( 0.25) 0.82    1642.0   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1600.31  Tc(MIN.) =   34.75
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    1622.12

****************************************************************************
 FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    697.38  DOWNSTREAM(FEET) =    662.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.69   CHANNEL SLOPE =  0.0147
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.82
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.267
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      374.11      0.30     0.748     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.748
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1775.75
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.84
 AVERAGE FLOW DEPTH(FEET) =   2.80   TRAVEL TIME(MIN.) =   3.63
 Tc(MIN.) =   38.38
 SUBAREA AREA(ACRES) =   374.11       SUBAREA RUNOFF(CFS) =  350.90
 EFFECTIVE AREA(ACRES) =   1996.23     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     2016.1         PEAK FLOW RATE(CFS) =    1841.41
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.87
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.87   FLOW VELOCITY(FEET/SEC.) =  10.97
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13026.00 =   16175.76 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1841.41   38.38    1.267  0.30( 0.24) 0.81    1996.2   13000.00
      2     1786.38   40.48    1.226  0.30( 0.24) 0.81    2016.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1841.41  Tc(MIN.) =   38.38
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1996.23
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     2016.1  TC(MIN.) =     38.38
  EFFECTIVE AREA(ACRES) =   1996.23  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.805
  PEAK FLOW RATE(CFS)   =    1841.41

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1841.41   38.38    1.267  0.30( 0.24) 0.81    1996.2   13000.00
      2     1786.38   40.48    1.226  0.30( 0.24) 0.81    2016.1   13010.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S31.DAT
  TIME/DATE OF STUDY: 13:30 04/03/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.080
   2)   10.00;  2.729
   3)   15.00;  2.163
   4)   20.00;  1.834
   5)   25.00;  1.614
   6)   30.00;  1.440
   7)   40.00;  1.233
   8)   50.00;  1.085
   9)   60.00;  0.950
  10)   90.00;  0.775
  11)  120.00;  0.657
  12)  180.00;  0.530
  13)  360.00;  0.367
  14) 1440.00;  0.153
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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************************************************************************
  FLOW PROCESS FROM NODE  13100.00 TO NODE  13101.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   282.58
  ELEVATION DATA: UPSTREAM(FEET) =   1069.66  DOWNSTREAM(FEET) =    969.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.312
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.185
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.94      0.30     1.000     0    8.31
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.44
  TOTAL AREA(ACRES) =      0.94   PEAK FLOW RATE(CFS) =      2.44

************************************************************************
  FLOW PROCESS FROM NODE  13101.00 TO NODE  13102.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    969.92  DOWNSTREAM(FEET) =    807.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.89   CHANNEL SLOPE =  0.2444
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.639
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.47
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   2.48
  Tc(MIN.) =   10.79
  SUBAREA AREA(ACRES) =     7.67       SUBAREA RUNOFF(CFS) =   16.15
  EFFECTIVE AREA(ACRES) =      8.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.6          PEAK FLOW RATE(CFS) =      18.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   5.40
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13102.00 =     948.47 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  13102.00 TO NODE  13103.00 IS CODE =  56
```

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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    807.20  DOWNSTREAM(FEET) =    769.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   691.01   CHANNEL SLOPE =  0.0539
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.336
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       20.65      0.30     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.30
  AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   13.47
  SUBAREA AREA(ACRES) =    20.65       SUBAREA RUNOFF(CFS) =   37.85
  EFFECTIVE AREA(ACRES) =     29.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3        PEAK FLOW RATE(CFS) =      53.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   4.87
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13103.00 =    1639.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   769.94  DOWNSTREAM(FEET) =   693.88
  FLOW LENGTH(FEET) =  1563.10   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  15.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.45
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      53.63
  PIPE TRAVEL TIME(MIN.) =   1.41    Tc(MIN.) =   14.88
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13104.00 =    3202.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.88
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.176
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       28.00      0.30     0.750     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.750
  SUBAREA AREA(ACRES) =   28.00      SUBAREA RUNOFF(CFS) =   49.17
  EFFECTIVE AREA(ACRES) =     57.26   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =       57.3       PEAK FLOW RATE(CFS) =      98.59

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   693.88  DOWNSTREAM(FEET) =   645.69
  FLOW LENGTH(FEET) =  1068.98   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  22.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.77
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      98.59
  PIPE TRAVEL TIME(MIN.) =   0.86    Tc(MIN.) =   15.74
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13105.00 =    4271.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.74
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.114
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.28      0.30     0.867     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
  SUBAREA AREA(ACRES) =   35.28      SUBAREA RUNOFF(CFS) =   58.87
  EFFECTIVE AREA(ACRES) =     92.54   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =       92.5       PEAK FLOW RATE(CFS) =     154.27

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.69  DOWNSTREAM(FEET) =   608.48
  FLOW LENGTH(FEET) =  1127.55   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.36
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     154.27
  PIPE TRAVEL TIME(MIN.) =   0.92    Tc(MIN.) =   16.66
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   16.66
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.054
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       37.68      0.30     0.889     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
 SUBAREA AREA(ACRES) =   37.68      SUBAREA RUNOFF(CFS) =   60.60
 EFFECTIVE AREA(ACRES) =    130.22   AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
 TOTAL AREA(ACRES) =      130.2       PEAK FLOW RATE(CFS) =     209.81

****************************************************************************
 FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S30.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1841.41   38.38  0.30( 0.24) 0.81    1996.2   13000.00
     2     1786.38   40.48  0.30( 0.24) 0.81    2016.1   13010.00
   TOTAL AREA(ACRES) =     2016.1

****************************************************************************
 FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     1841.41   38.38  0.30( 0.24) 0.81    1996.2   13000.00
     2     1786.38   40.48  0.30( 0.24) 0.81    2016.1   13010.00
   TOTAL AREA(ACRES) =      2016.1

****************************************************************************
 FLOW PROCESS FROM NODE  13026.00 TO NODE  13106.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    662.66  DOWNSTREAM(FEET) =    608.48
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3098.88   CHANNEL SLOPE =  0.0175
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
```



```
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.191
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       75.28      0.30     0.755     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1874.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.67
 AVERAGE FLOW DEPTH(FEET) =   2.76   TRAVEL TIME(MIN.) =   4.43
 Tc(MIN.) =   42.81
 SUBAREA AREA(ACRES) =    75.28       SUBAREA RUNOFF(CFS) =   65.38
 EFFECTIVE AREA(ACRES) =   2071.51     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
 TOTAL AREA(ACRES) =     2091.4         PEAK FLOW RATE(CFS) =    1841.41
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.73

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.73   FLOW VELOCITY(FEET/SEC.) =  11.61
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1841.41   42.81    1.191  0.30( 0.24) 0.80    2071.5   13000.00
     2     1786.38   44.94    1.160  0.30( 0.24) 0.80    2091.4   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1841.41  Tc(MIN.) =   42.81
 AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    2071.51

****************************************************************************
 FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1841.41   42.81    1.191  0.30( 0.24) 0.80    2071.5   13000.00
     2     1786.38   44.94    1.160  0.30( 0.24) 0.80    2091.4   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      209.81   16.66    2.054  0.30( 0.26) 0.88     130.2   13100.00
 LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
      1     1576.78   16.66    2.054  0.30( 0.24) 0.81     936.6   13100.00
      2     1950.18   42.81    1.191  0.30( 0.24) 0.81    2201.7   13000.00
      3     1891.45   44.94    1.160  0.30( 0.24) 0.81    2221.6   13010.00
    TOTAL AREA(ACRES) =      2221.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1950.18  Tc(MIN.) =   42.809
  EFFECTIVE AREA(ACRES) =   2201.73  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     2221.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13106.00 TO NODE  13107.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    608.48  DOWNSTREAM(FEET) =    584.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1650.20   CHANNEL SLOPE =  0.0147
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.04
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.155
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      190.45      0.30     0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2029.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.32
  AVERAGE FLOW DEPTH(FEET) =   3.03   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   45.24
  SUBAREA AREA(ACRES) =   190.45       SUBAREA RUNOFF(CFS) =  159.24
  EFFECTIVE AREA(ACRES) =   2392.18     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     2412.1         PEAK FLOW RATE(CFS) =    1968.67
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.98   FLOW VELOCITY(FEET/SEC.) =  11.21
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13107.00 =   20924.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1666.79   19.23    1.884  0.30( 0.24) 0.80    1127.0   13100.00
      2     1968.67   45.24    1.155  0.30( 0.24) 0.80    2392.2   13000.00
      3     1915.85   47.40    1.124  0.30( 0.24) 0.80    2412.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1968.67  Tc(MIN.) =   45.24
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    2392.18

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  13107.00 TO NODE  13108.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.29  DOWNSTREAM(FEET) =    563.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1061.67   CHANNEL SLOPE =  0.0193
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.135
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      314.12      0.30     0.939     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.939
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2089.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.52
  AVERAGE FLOW DEPTH(FEET) =   2.85   TRAVEL TIME(MIN.) =   1.41
  Tc(MIN.) =   46.65
  SUBAREA AREA(ACRES) =   314.12       SUBAREA RUNOFF(CFS) =  241.13
  EFFECTIVE AREA(ACRES) =   2706.30     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     2726.2         PEAK FLOW RATE(CFS) =    2164.75
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.91   FLOW VELOCITY(FEET/SEC.) =  12.67
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13108.00 =   21986.51 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2014.69   20.70    1.803  0.30( 0.25) 0.83    1441.2   13100.00
      2     2164.75   46.65    1.135  0.30( 0.25) 0.82    2706.3   13000.00
      3     2102.05   48.82    1.102  0.30( 0.25) 0.82    2726.2   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2164.75  Tc(MIN.) =   46.65
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2706.30

****************************************************************************
  FLOW PROCESS FROM NODE  13108.00 TO NODE  13109.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    563.78  DOWNSTREAM(FEET) =    541.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1657.28   CHANNEL SLOPE =  0.0134
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.30
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.099
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      203.63      0.30     0.785     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.785
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2243.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.35
  AVERAGE FLOW DEPTH(FEET) =   3.30   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   49.09
  SUBAREA AREA(ACRES) =   203.63       SUBAREA RUNOFF(CFS) =  158.18
  EFFECTIVE AREA(ACRES) =   2909.93     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     2929.8         PEAK FLOW RATE(CFS) =    2235.20
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.29   FLOW VELOCITY(FEET/SEC.) =  11.34
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13109.00 =   23643.79 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2141.34   23.17    1.695  0.30( 0.25) 0.83    1644.8   13100.00
      2     2235.20   49.09    1.099  0.30( 0.25) 0.82    2909.9   13000.00
      3     2169.40   51.28    1.068  0.30( 0.24) 0.82    2929.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2235.20  Tc(MIN.) =   49.09
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2909.93

****************************************************************************
  FLOW PROCESS FROM NODE  13109.00 TO NODE  13110.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    541.61  DOWNSTREAM(FEET) =    509.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2016.96   CHANNEL SLOPE =  0.0157
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.23
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.060
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      283.06      0.30     0.791     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.791
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2339.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.14
  AVERAGE FLOW DEPTH(FEET) =   3.23   TRAVEL TIME(MIN.) =   2.77
  Tc(MIN.) =   51.86
  SUBAREA AREA(ACRES) =   283.06       SUBAREA RUNOFF(CFS) =  209.59
  EFFECTIVE AREA(ACRES) =   3192.99     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3212.9         PEAK FLOW RATE(CFS) =    2343.74
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
```



```
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.23   FLOW VELOCITY(FEET/SEC.) =  12.15
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13110.00 =   25660.75 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2315.52   25.95    1.581  0.30( 0.25) 0.82    1927.8   13100.00
      2     2343.74   51.86    1.060  0.30( 0.24) 0.81    3193.0   13000.00
      3     2271.88   54.08    1.030  0.30( 0.24) 0.81    3212.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2343.74  Tc(MIN.) =   51.86
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3192.99

****************************************************************************
  FLOW PROCESS FROM NODE  13110.00 TO NODE  13111.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    509.94  DOWNSTREAM(FEET) =    461.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3058.95   CHANNEL SLOPE =  0.0160
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.29
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.004
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      248.05      0.30     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2429.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.36
  AVERAGE FLOW DEPTH(FEET) =   3.28   TRAVEL TIME(MIN.) =   4.12
  Tc(MIN.) =   55.98
  SUBAREA AREA(ACRES) =   248.05       SUBAREA RUNOFF(CFS) =  171.77
  EFFECTIVE AREA(ACRES) =   3441.04     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3460.9         PEAK FLOW RATE(CFS) =    2355.54
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.22   FLOW VELOCITY(FEET/SEC.) =  12.24
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13111.00 =   28719.70 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2337.42   30.06    1.439  0.30( 0.25) 0.82    2175.9   13100.00
      2     2355.54   55.98    1.004  0.30( 0.24) 0.81    3441.0   13000.00
      3     2274.18   58.24    0.974  0.30( 0.24) 0.81    3460.9   13010.00
```

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2355.54  Tc(MIN.) =   55.98
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3441.04

****************************************************************************
  FLOW PROCESS FROM NODE  13111.00 TO NODE  13112.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    461.07  DOWNSTREAM(FEET) =    452.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1781.78   CHANNEL SLOPE =  0.0047
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.955
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      179.91      0.30     0.694     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.694
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2416.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.14
  AVERAGE FLOW DEPTH(FEET) =   4.64   TRAVEL TIME(MIN.) =   3.65
  Tc(MIN.) =   59.63
  SUBAREA AREA(ACRES) =   179.91       SUBAREA RUNOFF(CFS) =  120.94
  EFFECTIVE AREA(ACRES) =   3620.95     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3640.9          PEAK FLOW RATE(CFS) =    2355.54
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.57   FLOW VELOCITY(FEET/SEC.) =   8.08
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13112.00 =   30501.48 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2376.98   33.70    1.363  0.30( 0.24) 0.81    2355.8   13100.00
      2     2355.54   59.63    0.955  0.30( 0.24) 0.81    3621.0   13000.00
      3     2283.53   61.93    0.939  0.30( 0.24) 0.81    3640.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2376.98  Tc(MIN.) =   33.70
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    2355.80

****************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    452.77  DOWNSTREAM(FEET) =    427.51
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1625.01   CHANNEL SLOPE =  0.0155
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.318
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      155.96      0.30     0.836     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.836
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2451.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.30
  AVERAGE FLOW DEPTH(FEET) =   3.32   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =   35.90
  SUBAREA AREA(ACRES) =   155.96       SUBAREA RUNOFF(CFS) =  149.79
  EFFECTIVE AREA(ACRES) =   2511.76     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3796.8          PEAK FLOW RATE(CFS) =    2430.15
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.31   FLOW VELOCITY(FEET/SEC.) =  12.26
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2430.15   35.90    1.318  0.30( 0.24) 0.81    2511.8   13100.00
      2     2369.17   61.84    0.939  0.30( 0.24) 0.81    3776.9   13000.00
      3     2335.44   64.17    0.926  0.30( 0.24) 0.81    3796.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2430.15  Tc(MIN.) =   35.90
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    2511.76
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3796.8  TC(MIN.) =     35.90
  EFFECTIVE AREA(ACRES) =   2511.76  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.810
  PEAK FLOW RATE(CFS)   =    2430.15

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2430.15   35.90    1.318  0.30( 0.24) 0.81    2511.8   13100.00
      2     2369.17   61.84    0.939  0.30( 0.24) 0.81    3776.9   13000.00
      3     2335.44   64.17    0.926  0.30( 0.24) 0.81    3796.8   13010.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S32.DAT
  TIME/DATE OF STUDY: 13:30 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.080
   2)   10.00;  2.729
   3)   15.00;  2.163
   4)   20.00;  1.834
   5)   25.00;  1.614
   6)   30.00;  1.440
   7)   40.00;  1.233
   8)   50.00;  1.085
   9)   60.00;  0.950
  10)   90.00;  0.775
  11)  120.00;  0.657
  12)  180.00;  0.530
  13)  360.00;  0.367
  14) 1440.00;  0.153
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13200.00 TO NODE  13201.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.57
  ELEVATION DATA: UPSTREAM(FEET) =   1069.04  DOWNSTREAM(FEET) =   1005.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.410
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.888
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.67      0.30     1.000     0    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.56
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      1.56

**************************************************************************
  FLOW PROCESS FROM NODE  13201.00 TO NODE  13202.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.76  DOWNSTREAM(FEET) =    896.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   747.55   CHANNEL SLOPE =  0.1455
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.395
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.52
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   3.54
  Tc(MIN.) =   12.95
  SUBAREA AREA(ACRES) =     7.41       SUBAREA RUNOFF(CFS) =   13.97
  EFFECTIVE AREA(ACRES) =      8.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.1          PEAK FLOW RATE(CFS) =      15.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   4.32
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13202.00 =    1046.12 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  31
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   896.98  DOWNSTREAM(FEET) =   840.27
  FLOW LENGTH(FEET) =  1789.59   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.13
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.24
  PIPE TRAVEL TIME(MIN.) =   2.68    Tc(MIN.) =   15.63
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13203.00 =    2835.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.63
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.122
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.89      0.30     0.731     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.731
  SUBAREA AREA(ACRES) =   38.89      SUBAREA RUNOFF(CFS) =   66.58
  EFFECTIVE AREA(ACRES) =     46.97   AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.78
  TOTAL AREA(ACRES) =       47.0       PEAK FLOW RATE(CFS) =      79.83

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   840.27  DOWNSTREAM(FEET) =   782.97
  FLOW LENGTH(FEET) =   992.54   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  18.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.77
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      79.83
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   16.39
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13204.00 =    3828.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.39
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.072
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       83.09      0.30     0.645     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.645
  SUBAREA AREA(ACRES) =   83.09      SUBAREA RUNOFF(CFS) =  140.45
  EFFECTIVE AREA(ACRES) =    130.06   AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      130.1       PEAK FLOW RATE(CFS) =     218.17

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   782.97  DOWNSTREAM(FEET) =   692.52
  FLOW LENGTH(FEET) =  2046.57   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.73
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     218.17
  PIPE TRAVEL TIME(MIN.) =   1.38    Tc(MIN.) =   17.77
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13205.00 =    5874.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.77
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.981
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       88.51      0.30     0.679     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.679
  SUBAREA AREA(ACRES) =   88.51      SUBAREA RUNOFF(CFS) =  141.57
  EFFECTIVE AREA(ACRES) =    218.57   AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      218.6       PEAK FLOW RATE(CFS) =     349.11

****************************************************************************
  FLOW PROCESS FROM NODE  13205.00 TO NODE  13206.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    692.52  DOWNSTREAM(FEET) =    605.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2704.69   CHANNEL SLOPE =  0.0323
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.89
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.742
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      163.73      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     458.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.41
  AVERAGE FLOW DEPTH(FEET) =   2.82   TRAVEL TIME(MIN.) =   4.33
  Tc(MIN.) =   22.10
  SUBAREA AREA(ACRES) =   163.73       SUBAREA RUNOFF(CFS) =  218.72
  EFFECTIVE AREA(ACRES) =    382.30     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.76
  TOTAL AREA(ACRES) =      382.3         PEAK FLOW RATE(CFS) =     520.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.01   FLOW VELOCITY(FEET/SEC.) =  10.80
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13206.00 =    8579.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13206.00 TO NODE  13207.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.24  DOWNSTREAM(FEET) =    555.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2479.15   CHANNEL SLOPE =  0.0201
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.72
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.563
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      143.41      0.30     0.888     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.888
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     604.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.48
  AVERAGE FLOW DEPTH(FEET) =   3.67   TRAVEL TIME(MIN.) =   4.36
  Tc(MIN.) =   26.46
  SUBAREA AREA(ACRES) =   143.41       SUBAREA RUNOFF(CFS) =  167.40
  EFFECTIVE AREA(ACRES) =    525.71     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      525.7         PEAK FLOW RATE(CFS) =     626.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.74   FLOW VELOCITY(FEET/SEC.) =   9.58
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13207.00 =   11058.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    555.41  DOWNSTREAM(FEET) =    505.65
```



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  CHANNEL LENGTH THRU SUBAREA(FEET) =  1734.55   CHANNEL SLOPE =  0.0287
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.62
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.473
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.56      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     694.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.20
  AVERAGE FLOW DEPTH(FEET) =   3.60   TRAVEL TIME(MIN.) =   2.58
  Tc(MIN.) =   29.04
  SUBAREA AREA(ACRES) =   123.56       SUBAREA RUNOFF(CFS) =  135.24
  EFFECTIVE AREA(ACRES) =    649.27     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      649.3         PEAK FLOW RATE(CFS) =     719.55
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.67   FLOW VELOCITY(FEET/SEC.) =  11.32
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.04
  RAINFALL INTENSITY(INCH/HR) =   1.47
  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81
  EFFECTIVE STREAM AREA(ACRES) =     649.27
  TOTAL STREAM AREA(ACRES) =     649.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     719.55

****************************************************************************
  FLOW PROCESS FROM NODE  13210.00 TO NODE  13211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   314.51
  ELEVATION DATA: UPSTREAM(FEET) =    949.80  DOWNSTREAM(FEET) =    828.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.525
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.127
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

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  NATURAL FAIR COVER
  "OPEN BRUSH"                -       1.96      0.30     1.000     0    8.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.99
  TOTAL AREA(ACRES) =      1.96   PEAK FLOW RATE(CFS) =      4.99

****************************************************************************
  FLOW PROCESS FROM NODE  13211.00 TO NODE  13212.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    828.64  DOWNSTREAM(FEET) =    767.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   652.49   CHANNEL SLOPE =  0.0930
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.582
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.92
  AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =   2.77
  Tc(MIN.) =   11.30
  SUBAREA AREA(ACRES) =    11.95       SUBAREA RUNOFF(CFS) =   24.54
  EFFECTIVE AREA(ACRES) =     13.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.9         PEAK FLOW RATE(CFS) =      28.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   4.71
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13212.00 =     967.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13212.00 TO NODE  13213.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    767.94  DOWNSTREAM(FEET) =    706.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.91   CHANNEL SLOPE =  0.0635
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.223
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.08
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   3.17
  Tc(MIN.) =   14.47
  SUBAREA AREA(ACRES) =    27.07       SUBAREA RUNOFF(CFS) =   46.84
  EFFECTIVE AREA(ACRES) =     40.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.0         PEAK FLOW RATE(CFS) =      70.92
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =   5.64
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13213.00 =    1934.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13213.00 TO NODE  13214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    706.43  DOWNSTREAM(FEET) =    659.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.11   CHANNEL SLOPE =  0.0497
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.008
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      84.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.49
  AVERAGE FLOW DEPTH(FEET) =   1.24   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   17.35
  SUBAREA AREA(ACRES) =    18.09       SUBAREA RUNOFF(CFS) =   27.81
  EFFECTIVE AREA(ACRES) =     59.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       59.1         PEAK FLOW RATE(CFS) =      90.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.29   FLOW VELOCITY(FEET/SEC.) =   5.61
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13214.00 =    2883.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13214.00 TO NODE  13215.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    659.31  DOWNSTREAM(FEET) =    628.91
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  CHANNEL LENGTH THRU SUBAREA(FEET) =   970.24   CHANNEL SLOPE =  0.0313
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.821
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       71.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     139.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.48
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   2.95
  Tc(MIN.) =   20.30
  SUBAREA AREA(ACRES) =    71.42       SUBAREA RUNOFF(CFS) =   97.75
  EFFECTIVE AREA(ACRES) =    130.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      130.5         PEAK FLOW RATE(CFS) =     178.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.13   FLOW VELOCITY(FEET/SEC.) =   5.87
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13215.00 =    3853.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13215.00 TO NODE  13216.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    628.91  DOWNSTREAM(FEET) =    598.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =   922.63   CHANNEL SLOPE =  0.0331
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.712
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.33      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     201.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.22
  AVERAGE FLOW DEPTH(FEET) =   2.24   TRAVEL TIME(MIN.) =   2.47
  Tc(MIN.) =   22.78
  SUBAREA AREA(ACRES) =    36.33       SUBAREA RUNOFF(CFS) =   46.17
  EFFECTIVE AREA(ACRES) =    166.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      166.8         PEAK FLOW RATE(CFS) =     211.99
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) =  2.30   FLOW VELOCITY(FEET/SEC.) =   6.31
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13216.00 =    4775.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13216.00 TO NODE  13217.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    598.39  DOWNSTREAM(FEET) =    568.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   636.40   CHANNEL SLOPE =  0.0470
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.23
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.649
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       42.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     237.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.40
  AVERAGE FLOW DEPTH(FEET) =   2.22   TRAVEL TIME(MIN.) =   1.43
  Tc(MIN.) =   24.21
  SUBAREA AREA(ACRES) =    42.51       SUBAREA RUNOFF(CFS) =   51.61
  EFFECTIVE AREA(ACRES) =    209.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      209.3         PEAK FLOW RATE(CFS) =     254.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.31   FLOW VELOCITY(FEET/SEC.) =   7.53
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13217.00 =    5412.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    568.48  DOWNSTREAM(FEET) =    505.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.50   CHANNEL SLOPE =  0.0331
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.483
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.24      0.30     0.951     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     293.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.94
  AVERAGE FLOW DEPTH(FEET) =   2.74   TRAVEL TIME(MIN.) =   4.56
```

```
  Tc(MIN.) =   28.77
  SUBAREA AREA(ACRES) =    73.24       SUBAREA RUNOFF(CFS) =   78.95
  EFFECTIVE AREA(ACRES) =    282.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      282.6         PEAK FLOW RATE(CFS) =     301.81
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.78   FLOW VELOCITY(FEET/SEC.) =   6.98
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13220.00 =    7308.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.77
  RAINFALL INTENSITY(INCH/HR) =   1.48
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     282.57
  TOTAL STREAM AREA(ACRES) =     282.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     301.81

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      719.55   29.04    1.473  0.30( 0.24) 0.81     649.3   13200.00
      2      301.81   28.77    1.483  0.30( 0.30) 0.99     282.6   13210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1020.11   28.77    1.483  0.30( 0.26) 0.86     925.8   13210.00
      2     1018.96   29.04    1.473  0.30( 0.26) 0.86     931.8   13200.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1020.11    Tc(MIN.) =    28.77
  EFFECTIVE AREA(ACRES) =     925.77   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      931.8
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13220.00 TO NODE  13221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    505.65  DOWNSTREAM(FEET) =    478.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1949.14   CHANNEL SLOPE =  0.0137
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.69
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.409
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      108.50      0.30     0.637     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.637
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1079.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.88
  AVERAGE FLOW DEPTH(FEET) =   4.69   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   31.50
  SUBAREA AREA(ACRES) =   108.50       SUBAREA RUNOFF(CFS) =  118.92
  EFFECTIVE AREA(ACRES) =   1034.27     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     1040.3         PEAK FLOW RATE(CFS) =    1077.39
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.68   FLOW VELOCITY(FEET/SEC.) =  11.89
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13221.00 =   14742.35 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1077.39   31.50    1.409  0.30( 0.25) 0.84    1034.3   13210.00
      2     1078.46   31.77    1.403  0.30( 0.25) 0.84    1040.3   13200.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1078.46  Tc(MIN.) =   31.77
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =    1040.34

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    478.94  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2078.70   CHANNEL SLOPE =  0.0247
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.13
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.355
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.26      0.30     0.699     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.699
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1123.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.93
```

```
  AVERAGE FLOW DEPTH(FEET) =   4.12   TRAVEL TIME(MIN.) =   2.32
  Tc(MIN.) =   34.10
  SUBAREA AREA(ACRES) =    87.26       SUBAREA RUNOFF(CFS) =   89.97
  EFFECTIVE AREA(ACRES) =   1127.60     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     1127.6         PEAK FLOW RATE(CFS) =    1123.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.12   FLOW VELOCITY(FEET/SEC.) =  14.93
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1123.03   33.82    1.361  0.30( 0.25) 0.83    1121.5   13210.00
      2     1123.44   34.10    1.355  0.30( 0.25) 0.83    1127.6   13200.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1123.44  Tc(MIN.) =   34.10
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =    1127.60
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1127.6  TC(MIN.) =     34.10
  EFFECTIVE AREA(ACRES) =   1127.60  AREA-AVERAGED Fm(INCH/HR)=  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.828
  PEAK FLOW RATE(CFS)   =    1123.44

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1123.03   33.82    1.361  0.30( 0.25) 0.83    1121.5   13210.00
      2     1123.44   34.10    1.355  0.30( 0.25) 0.83    1127.6   13200.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S33.DAT
  TIME/DATE OF STUDY: 09:32 09/12/2017
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.826
   2)   10.00;  3.153
   3)   15.00;  2.414
   4)   20.00;  2.000
   5)   25.00;  1.745
   6)   30.00;  1.533
   7)   40.00;  1.333
   8)   50.00;  1.180
   9)   60.00;  1.055
  10)   90.00;  0.886
  11)  120.00;  0.775
  12)  180.00;  0.645
  13)  360.00;  0.475
  14) 1440.00;  0.208
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S31.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2430.15   35.90  0.30( 0.24) 0.81    2511.8   13100.00
      2     2369.17   61.84  0.30( 0.24) 0.81    3776.9   13000.00
      3     2335.44   64.17  0.30( 0.24) 0.81    3796.8   13010.00
    TOTAL AREA(ACRES) =     3796.8

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S32.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1123.03   33.82  0.30( 0.25) 0.83    1121.5   13210.00
      2     1123.44   34.10  0.30( 0.25) 0.83    1127.6   13200.00
    TOTAL AREA(ACRES) =     1127.6

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1123.03   33.82  0.30( 0.25) 0.83    1121.5   13210.00
      2     1123.44   34.10  0.30( 0.25) 0.83    1127.6   13200.00
    TOTAL AREA(ACRES) =      1127.6

****************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1123.03   33.82    1.457  0.30( 0.25) 0.83    1121.5   13210.00
      2     1123.44   34.10    1.451  0.30( 0.25) 0.83    1127.6   13200.00
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2430.15   35.90    1.415  0.30( 0.24) 0.81    2511.8   13100.00
      2     2369.17   61.84    1.044  0.30( 0.24) 0.81    3776.9   13000.00
```

```
     3     2335.44   64.17    1.031  0.30( 0.24) 0.81    3796.8   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3493.97   33.82    1.457  0.30( 0.24) 0.82    3488.3   13210.00
      2     3502.69   34.10    1.451  0.30( 0.24) 0.82    3513.3   13200.00
      3     3519.88   35.90    1.415  0.30( 0.24) 0.82    3639.4   13100.00
      4     3112.81   61.84    1.044  0.30( 0.24) 0.81    4904.5   13000.00
      5     3066.80   64.17    1.031  0.30( 0.24) 0.81    4924.4   13010.00
    TOTAL AREA(ACRES) =      4924.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3519.88  Tc(MIN.) =   35.897
  EFFECTIVE AREA(ACRES) =   3639.36  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4924.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13223.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    416.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   864.00   CHANNEL SLOPE =  0.0129
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.06
  CHANNEL FLOW THRU SUBAREA(CFS) =    3519.88
  FLOW VELOCITY(FEET/SEC.) =  10.66   FLOW DEPTH(FEET) =   5.06
  TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =   37.25
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3719.73   35.18    1.429  0.30( 0.24) 0.82    3488.3   13210.00
      2     3729.36   35.45    1.424  0.30( 0.24) 0.82    3513.3   13200.00
      3     3745.37   37.25    1.388  0.30( 0.24) 0.82    3639.4   13100.00
      4     3500.00   63.24    1.037  0.30( 0.24) 0.81    4904.5   13000.00
      5     3456.01   65.58    1.023  0.30( 0.24) 0.81    4924.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3745.37  Tc(MIN.) =   37.25
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    3639.36

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE = 15.1
----------------------------------------------------------------------------
```



```
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610301W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       66.00   12.36  0.30( 0.30) 1.00      29.3   30100.00
      2       56.48   15.00  0.30( 0.30) 1.00      29.7   30110.00
    TOTAL AREA(ACRES) =       29.7

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3719.73   35.18    1.429  0.30( 0.24) 0.82    3488.3   13210.00
      2     3729.36   35.45    1.424  0.30( 0.24) 0.82    3513.3   13200.00
      3     3745.37   37.25    1.388  0.30( 0.24) 0.82    3639.4   13100.00
      4     3500.00   63.24    1.037  0.30( 0.24) 0.81    4904.5   13000.00
      5     3456.01   65.58    1.023  0.30( 0.24) 0.81    4924.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       66.00   12.36    2.804  0.30( 0.30) 1.00      29.3   30100.00
      2       56.48   15.00    2.415  0.30( 0.30) 1.00      29.7   30110.00
  LONGEST FLOWPATH FROM NODE  30110.00 TO NODE  13223.00 =    2058.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2889.42   12.36    2.804  0.30( 0.25) 0.82    1255.1   30100.00
      2     2960.98   15.00    2.415  0.30( 0.25) 0.82    1516.8   30110.00
      3     3749.90   35.18    1.429  0.30( 0.25) 0.82    3517.9   13210.00
      4     3759.38   35.45    1.424  0.30( 0.25) 0.82    3543.0   13200.00
      5     3774.43   37.25    1.388  0.30( 0.25) 0.82    3669.0   13100.00
      6     3519.67   63.24    1.037  0.30( 0.24) 0.81    4934.2   13000.00
      7     3475.33   65.58    1.023  0.30( 0.24) 0.81    4954.1   13010.00
    TOTAL AREA(ACRES) =      4954.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3774.43  Tc(MIN.) =   37.248
  EFFECTIVE AREA(ACRES) =   3669.04  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4954.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13224.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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 ELEVATION DATA: UPSTREAM(FEET) =    416.40  DOWNSTREAM(FEET) =    410.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =   408.51   CHANNEL SLOPE =  0.0142
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.12
 CHANNEL FLOW THRU SUBAREA(CFS) =    3774.43
 FLOW VELOCITY(FEET/SEC.) =  11.27   FLOW DEPTH(FEET) =   5.12
 TRAVEL TIME(MIN.) =   0.60   Tc(MIN.) =   37.85
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2889.42   13.02    2.707  0.30( 0.25) 0.82    1255.1   30100.00
     2     2960.98   15.65    2.360  0.30( 0.25) 0.82    1516.8   30110.00
     3     3749.90   35.78    1.417  0.30( 0.25) 0.82    3517.9   13210.00
     4     3759.38   36.05    1.412  0.30( 0.25) 0.82    3543.0   13200.00
     5     3774.43   37.85    1.376  0.30( 0.25) 0.82    3669.0   13100.00
     6     3519.67   63.86    1.033  0.30( 0.24) 0.81    4934.2   13000.00
     7     3475.33   66.20    1.020  0.30( 0.24) 0.81    4954.1   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    3774.43  Tc(MIN.) =   37.85
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    3669.04

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610302W.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
     1       29.89   10.42  0.30( 0.30) 1.00      11.9   30210.00
     2       29.64   10.78  0.30( 0.30) 1.00      12.0   30200.00
   TOTAL AREA(ACRES) =       12.0

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2889.42   13.02    2.707  0.30( 0.25) 0.82    1255.1   30100.00
     2     2960.98   15.65    2.360  0.30( 0.25) 0.82    1516.8   30110.00
     3     3749.90   35.78    1.417  0.30( 0.25) 0.82    3517.9   13210.00
     4     3759.38   36.05    1.412  0.30( 0.25) 0.82    3543.0   13200.00
     5     3774.43   37.85    1.376  0.30( 0.25) 0.82    3669.0   13100.00
```



```
     6     3519.67   63.86    1.033  0.30( 0.24) 0.81    4934.2   13000.00
     7     3475.33   66.20    1.020  0.30( 0.24) 0.81    4954.1   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       29.89   10.42    3.091  0.30( 0.30) 1.00      11.9   30210.00
     2       29.64   10.78    3.038  0.30( 0.30) 1.00      12.0   30200.00
 LONGEST FLOWPATH FROM NODE  30200.00 TO NODE  13224.00 =    1209.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2702.87   10.42    3.091  0.30( 0.25) 0.82    1016.2   30210.00
     2     2742.98   10.78    3.038  0.30( 0.25) 0.82    1050.7   30200.00
     3     2915.47   13.02    2.707  0.30( 0.25) 0.82    1267.1   30100.00
     4     2983.28   15.65    2.360  0.30( 0.25) 0.82    1528.8   30110.00
     5     3761.99   35.78    1.417  0.30( 0.25) 0.82    3530.0   13210.00
     6     3771.42   36.05    1.412  0.30( 0.25) 0.82    3555.0   13200.00
     7     3786.08   37.85    1.376  0.30( 0.25) 0.82    3681.1   13100.00
     8     3527.61   63.86    1.033  0.30( 0.24) 0.81    4946.2   13000.00
     9     3483.12   66.20    1.020  0.30( 0.24) 0.81    4966.1   13010.00
   TOTAL AREA(ACRES) =      4966.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     3786.08  Tc(MIN.) =   37.852
 EFFECTIVE AREA(ACRES) =   3681.07  AREA-AVERAGED Fm(INCH/HR) =  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
 TOTAL AREA(ACRES) =     4966.1
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13301.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    410.60  DOWNSTREAM(FEET) =    382.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.70   CHANNEL SLOPE =  0.0227
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.52
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.344
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       61.66      0.30     0.998     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3815.07
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.28
 AVERAGE FLOW DEPTH(FEET) =   4.52   TRAVEL TIME(MIN.) =   1.58
 Tc(MIN.) =   39.43
 SUBAREA AREA(ACRES) =    61.66       SUBAREA RUNOFF(CFS) =   57.99
 EFFECTIVE AREA(ACRES) =   3742.73     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
 TOTAL AREA(ACRES) =     5027.8         PEAK FLOW RATE(CFS) =    3786.08
```

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.50 FLOW VELOCITY(FEET/SEC.) = 13.26
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2702.87	12.17	2.832	0.30(0.25)	0.83	1077.9	30210.00
2	2742.98	12.52	2.780	0.30(0.25)	0.83	1112.4	30200.00
3	2915.47	14.73	2.454	0.30(0.25)	0.83	1328.8	30100.00
4	2983.28	17.35	2.219	0.30(0.25)	0.83	1590.5	30110.00
5	3761.99	37.37	1.386	0.30(0.25)	0.82	3591.6	13210.00
6	3771.42	37.64	1.380	0.30(0.25)	0.82	3616.7	13200.00
7	3786.08	39.43	1.344	0.30(0.25)	0.82	3742.7	13100.00
8	3527.61	65.48	1.024	0.30(0.24)	0.82	5007.9	13000.00
9	3483.12	67.83	1.011	0.30(0.24)	0.82	5027.8	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 3786.08 Tc(MIN.) = 39.43
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 3742.73

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610303W.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	249.67	20.60	0.30(0.30)	1.00	166.2	30300.00

TOTAL AREA(ACRES) = 166.2

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2702.87	12.17	2.832	0.30(0.25)	0.83	1077.9	30210.00
2	2742.98	12.52	2.780	0.30(0.25)	0.83	1112.4	30200.00
3	2915.47	14.73	2.454	0.30(0.25)	0.83	1328.8	30100.00
4	2983.28	17.35	2.219	0.30(0.25)	0.83	1590.5	30110.00
5	3761.99	37.37	1.386	0.30(0.25)	0.82	3591.6	13210.00
6	3771.42	37.64	1.380	0.30(0.25)	0.82	3616.7	13200.00
7	3786.08	39.43	1.344	0.30(0.25)	0.82	3742.7	13100.00
8	3527.61	65.48	1.024	0.30(0.24)	0.82	5007.9	13000.00
9	3483.12	67.83	1.011	0.30(0.24)	0.82	5027.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	249.67	20.60	1.969	0.30(0.30)	1.00	166.2	30300.00

LONGEST FLOWPATH FROM NODE 30300.00 TO NODE 13301.00 = 6391.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2926.64	12.17	2.832	0.30(0.25)	0.85	1176.1	30210.00
2	2968.49	12.52	2.780	0.30(0.25)	0.85	1213.4	30200.00
3	3145.88	14.73	2.454	0.30(0.25)	0.84	1447.6	30100.00
4	3225.11	17.35	2.219	0.30(0.25)	0.84	1730.5	30110.00
5	3359.35	20.60	1.969	0.30(0.25)	0.84	2081.5	30300.00
6	3924.39	37.37	1.386	0.30(0.25)	0.83	3757.8	13210.00
7	3933.00	37.64	1.380	0.30(0.25)	0.83	3782.9	13200.00
8	3942.29	39.43	1.344	0.30(0.25)	0.83	3908.9	13100.00
9	3635.91	65.48	1.024	0.30(0.25)	0.82	5174.1	13000.00
10	3589.44	67.83	1.011	0.30(0.25)	0.82	5194.0	13010.00

TOTAL AREA(ACRES) = 5194.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3942.29 Tc(MIN.) = 39.434
EFFECTIVE AREA(ACRES) = 3908.94 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5194.0
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 382.00 DOWNSTREAM(FEET) = 375.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1141.09 CHANNEL SLOPE = 0.0061
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.62
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.308
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.42	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3946.56
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.55
AVERAGE FLOW DEPTH(FEET) = 6.61 TRAVEL TIME(MIN.) = 2.23
Tc(MIN.) = 41.66
SUBAREA AREA(ACRES) = 9.42 SUBAREA RUNOFF(CFS) = 8.54
EFFECTIVE AREA(ACRES) = 3918.36 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5203.4 PEAK FLOW RATE(CFS) = 3942.29
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.61 FLOW VELOCITY(FEET/SEC.) = 8.54
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2926.64	14.61	2.472	0.30(0.25)	0.85	1185.5	30210.00
2	2968.49	14.95	2.422	0.30(0.25)	0.85	1222.8	30200.00
3	3145.88	17.11	2.239	0.30(0.25)	0.84	1457.1	30100.00
4	3225.11	19.72	2.023	0.30(0.25)	0.84	1739.9	30110.00
5	3359.35	22.94	1.850	0.30(0.25)	0.84	2091.0	30300.00
6	3924.39	39.60	1.341	0.30(0.25)	0.83	3767.3	13210.00
7	3933.00	39.87	1.336	0.30(0.25)	0.83	3792.3	13200.00
8	3942.29	41.66	1.308	0.30(0.25)	0.83	3918.4	13100.00
9	3635.91	67.76	1.011	0.30(0.25)	0.82	5183.5	13000.00
10	3589.44	70.12	0.998	0.30(0.25)	0.82	5203.4	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 3942.29 Tc(MIN.) = 41.66
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 3918.36

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610214W.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	305.18	24.12	0.30(0.30)	1.00	227.7	21400.00

TOTAL AREA(ACRES) = 227.7

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2926.64	14.61	2.472	0.30(0.25)	0.85	1185.5	30210.00
2	2968.49	14.95	2.422	0.30(0.25)	0.85	1222.8	30200.00
3	3145.88	17.11	2.239	0.30(0.25)	0.84	1457.1	30100.00
4	3225.11	19.72	2.023	0.30(0.25)	0.84	1739.9	30110.00
5	3359.35	22.94	1.850	0.30(0.25)	0.84	2091.0	30300.00
6	3924.39	39.60	1.341	0.30(0.25)	0.83	3767.3	13210.00
7	3933.00	39.87	1.336	0.30(0.25)	0.83	3792.3	13200.00
8	3942.29	41.66	1.308	0.30(0.25)	0.83	3918.4	13100.00

9	3635.91	67.76	1.011	0.30(0.25)	0.82	5183.5	13000.00
10	3589.44	70.12	0.998	0.30(0.25)	0.82	5203.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	305.18	24.12	1.789	0.30(0.30)	1.00	227.7	21400.00

LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 13302.00 = 6708.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3196.17	14.61	2.472	0.30(0.26)	0.86	1323.3	30210.00
2	3237.92	14.95	2.422	0.30(0.26)	0.86	1363.9	30200.00
3	3427.76	17.11	2.239	0.30(0.26)	0.86	1618.6	30100.00
4	3513.70	19.72	2.023	0.30(0.26)	0.86	1926.0	30110.00
5	3661.32	22.94	1.850	0.30(0.26)	0.86	2307.4	30300.00
6	3704.76	24.12	1.789	0.30(0.26)	0.86	2438.0	21400.00
7	4137.70	39.60	1.341	0.30(0.25)	0.84	3994.9	13210.00
8	4145.22	39.87	1.336	0.30(0.25)	0.84	4020.0	13200.00
9	4148.76	41.66	1.308	0.30(0.25)	0.84	4146.0	13100.00
10	3781.64	67.76	1.011	0.30(0.25)	0.83	5411.2	13000.00
11	3732.45	70.12	0.998	0.30(0.25)	0.83	5431.1	13010.00

TOTAL AREA(ACRES) = 5431.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4148.76 Tc(MIN.) = 41.659
EFFECTIVE AREA(ACRES) = 4146.02 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 5431.1
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13303.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 375.00 DOWNSTREAM(FEET) = 355.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2193.96 CHANNEL SLOPE = 0.0091
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.10
CHANNEL FLOW THRU SUBAREA(CFS) = 4148.76
FLOW VELOCITY(FEET/SEC.) = 9.96 FLOW DEPTH(FEET) = 6.10
TRAVEL TIME(MIN.) = 3.67 Tc(MIN.) = 45.33
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3196.17	18.59	2.117	0.30(0.26)	0.86	1323.3	30210.00
2	3237.92	18.91	2.090	0.30(0.26)	0.86	1363.9	30200.00
3	3427.76	21.01	1.948	0.30(0.26)	0.86	1618.6	30100.00
4	3513.70	23.58	1.817	0.30(0.26)	0.86	1926.0	30110.00
5	3661.32	26.75	1.671	0.30(0.26)	0.86	2307.4	30300.00
6	3704.76	27.93	1.621	0.30(0.26)	0.86	2438.0	21400.00

```
      7     4137.70   43.27    1.283  0.30( 0.25) 0.84    3994.9   13210.00
      8     4145.22   43.54    1.279  0.30( 0.25) 0.84    4020.0   13200.00
      9     4148.76   45.33    1.252  0.30( 0.25) 0.84    4146.0   13100.00
     10     3781.64   71.54    0.990  0.30( 0.25) 0.83    5411.2   13000.00
     11     3732.45   73.91    0.976  0.30( 0.25) 0.83    5431.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    4148.76  Tc(MIN.) =   45.33
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =    4146.02

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610213W.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      182.91   15.54  0.30( 0.30) 1.00      98.2   21300.00
    TOTAL AREA(ACRES) =       98.2

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3196.17   18.59    2.117  0.30( 0.26) 0.86    1323.3   30210.00
      2     3237.92   18.91    2.090  0.30( 0.26) 0.86    1363.9   30200.00
      3     3427.76   21.01    1.948  0.30( 0.26) 0.86    1618.6   30100.00
      4     3513.70   23.58    1.817  0.30( 0.26) 0.86    1926.0   30110.00
      5     3661.32   26.75    1.671  0.30( 0.26) 0.86    2307.4   30300.00
      6     3704.76   27.93    1.621  0.30( 0.26) 0.86    2438.0   21400.00
      7     4137.70   43.27    1.283  0.30( 0.25) 0.84    3994.9   13210.00
      8     4145.22   43.54    1.279  0.30( 0.25) 0.84    4020.0   13200.00
      9     4148.76   45.33    1.252  0.30( 0.25) 0.84    4146.0   13100.00
     10     3781.64   71.54    0.990  0.30( 0.25) 0.83    5411.2   13000.00
     11     3732.45   73.91    0.976  0.30( 0.25) 0.83    5431.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      182.91   15.54    2.369  0.30( 0.30) 1.00      98.2   21300.00
  LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  13303.00 =    2988.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3218.85   15.54    2.369  0.30( 0.26) 0.87    1204.9   21300.00
      2     3356.76   18.59    2.117  0.30( 0.26) 0.87    1421.6   30210.00
      3     3396.16   18.91    2.090  0.30( 0.26) 0.87    1462.1   30200.00
      4     3573.45   21.01    1.948  0.30( 0.26) 0.87    1716.8   30100.00
      5     3647.79   23.58    1.817  0.30( 0.26) 0.86    2024.2   30110.00
      6     3782.47   26.75    1.671  0.30( 0.26) 0.86    2405.6   30300.00
      7     3821.53   27.93    1.621  0.30( 0.26) 0.86    2536.2   21400.00
      8     4224.59   43.27    1.283  0.30( 0.25) 0.84    4093.1   13210.00
      9     4231.74   43.54    1.279  0.30( 0.25) 0.84    4118.2   13200.00
     10     4232.87   45.33    1.252  0.30( 0.25) 0.84    4244.2   13100.00
     11     3842.61   71.54    0.990  0.30( 0.25) 0.83    5509.4   13000.00
     12     3792.24   73.91    0.976  0.30( 0.25) 0.83    5529.3   13010.00
    TOTAL AREA(ACRES) =      5529.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4232.87  Tc(MIN.) =   45.331
  EFFECTIVE AREA(ACRES) =   4244.24  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5529.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13304.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    355.00  DOWNSTREAM(FEET) =    350.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.40   CHANNEL SLOPE =  0.0054
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.12
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.223
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4238.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.35
  AVERAGE FLOW DEPTH(FEET) =   7.12   TRAVEL TIME(MIN.) =   1.85
  Tc(MIN.) =   47.18
  SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =   11.50
  EFFECTIVE AREA(ACRES) =   4258.08     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     5543.1          PEAK FLOW RATE(CFS) =    4232.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.11   FLOW VELOCITY(FEET/SEC.) =   8.34
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3218.85	17.55	2.203	0.30(0.26)	0.88	1218.7	21300.00
2	3356.76	20.57	1.971	0.30(0.26)	0.87	1435.4	30210.00
3	3396.16	20.88	1.955	0.30(0.26)	0.87	1475.9	30200.00
4	3573.45	22.95	1.849	0.30(0.26)	0.87	1730.6	30100.00
5	3647.79	25.51	1.723	0.30(0.26)	0.87	2038.0	30110.00
6	3782.47	28.66	1.590	0.30(0.26)	0.86	2419.5	30300.00
7	3821.53	29.83	1.540	0.30(0.26)	0.86	2550.0	21400.00
8	4224.59	45.12	1.255	0.30(0.25)	0.84	4107.0	13210.00
9	4231.74	45.39	1.251	0.30(0.25)	0.84	4132.0	13200.00
10	4232.87	47.18	1.223	0.30(0.25)	0.84	4258.1	13100.00
11	3842.61	73.44	0.979	0.30(0.25)	0.83	5523.2	13000.00
12	3792.24	75.82	0.966	0.30(0.25)	0.83	5543.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 4232.87 Tc(MIN.) = 47.18
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 4258.08

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610304W.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	269.02	18.59	0.30(0.30)	1.00	164.5	30410.00
2	250.43	23.46	0.30(0.30)	1.00	182.7	30400.00

TOTAL AREA(ACRES) = 182.7

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3218.85	17.55	2.203	0.30(0.26)	0.88	1218.7	21300.00
2	3356.76	20.57	1.971	0.30(0.26)	0.87	1435.4	30210.00
3	3396.16	20.88	1.955	0.30(0.26)	0.87	1475.9	30200.00
4	3573.45	22.95	1.849	0.30(0.26)	0.87	1730.6	30100.00
5	3647.79	25.51	1.723	0.30(0.26)	0.87	2038.0	30110.00
6	3782.47	28.66	1.590	0.30(0.26)	0.86	2419.5	30300.00
7	3821.53	29.83	1.540	0.30(0.26)	0.86	2550.0	21400.00
8	4224.59	45.12	1.255	0.30(0.25)	0.84	4107.0	13210.00
9	4231.74	45.39	1.251	0.30(0.25)	0.84	4132.0	13200.00
10	4232.87	47.18	1.223	0.30(0.25)	0.84	4258.1	13100.00
11	3842.61	73.44	0.979	0.30(0.25)	0.83	5523.2	13000.00

12	3792.24	75.82	0.966	0.30(0.25)	0.83	5543.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	269.02	18.59	2.117	0.30(0.30)	1.00	164.5	30410.00
2	250.43	23.46	1.823	0.30(0.30)	1.00	182.7	30400.00

LONGEST FLOWPATH FROM NODE 30400.00 TO NODE 13304.00 = 5899.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3484.88	17.55	2.203	0.30(0.27)	0.89	1374.0	21300.00
2	3535.35	18.59	2.117	0.30(0.27)	0.89	1457.8	30410.00
3	3618.23	20.57	1.971	0.30(0.27)	0.89	1607.3	30210.00
4	3656.43	20.88	1.955	0.30(0.27)	0.89	1649.0	30200.00
5	3825.84	22.95	1.849	0.30(0.26)	0.88	1911.4	30100.00
6	3838.76	23.46	1.823	0.30(0.26)	0.88	1974.9	30400.00
7	3881.77	25.51	1.723	0.30(0.26)	0.88	2220.8	30110.00
8	3994.55	28.66	1.590	0.30(0.26)	0.87	2602.2	30300.00
9	4025.50	29.83	1.540	0.30(0.26)	0.87	2732.7	21400.00
10	4381.58	45.12	1.255	0.30(0.25)	0.85	4289.7	13210.00
11	4388.06	45.39	1.251	0.30(0.25)	0.85	4314.7	13200.00
12	4384.69	47.18	1.223	0.30(0.25)	0.85	4440.8	13100.00
13	3954.27	73.44	0.979	0.30(0.25)	0.84	5705.9	13000.00
14	3901.69	75.82	0.966	0.30(0.25)	0.84	5725.8	13010.00

TOTAL AREA(ACRES) = 5725.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4388.06 Tc(MIN.) = 45.388
EFFECTIVE AREA(ACRES) = 4314.74 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87
TOTAL AREA(ACRES) = 5725.8
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13305.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 350.00 DOWNSTREAM(FEET) = 315.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.27 CHANNEL SLOPE = 0.0118
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.87
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.183
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4398.94
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.08
AVERAGE FLOW DEPTH(FEET) = 5.87 TRAVEL TIME(MIN.) = 4.46
Tc(MIN.) = 49.85

SUBAREA AREA(ACRES) = 27.39 SUBAREA RUNOFF(CFS) = 21.76
EFFECTIVE AREA(ACRES) = 4342.13 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 5753.2 PEAK FLOW RATE(CFS) = 4388.06
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.86 FLOW VELOCITY(FEET/SEC.) = 11.08
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3484.88	22.33	1.881	0.30(0.27)	0.89	1401.4	21300.00
2	3535.35	23.35	1.829	0.30(0.27)	0.89	1485.2	30410.00
3	3618.23	25.30	1.732	0.30(0.27)	0.89	1634.7	30210.00
4	3656.43	25.60	1.719	0.30(0.27)	0.89	1676.4	30200.00
5	3825.84	27.60	1.635	0.30(0.26)	0.88	1938.8	30100.00
6	3838.76	28.11	1.613	0.30(0.26)	0.88	2002.3	30400.00
7	3881.77	30.14	1.530	0.30(0.26)	0.88	2248.1	30110.00
8	3994.55	33.25	1.468	0.30(0.26)	0.87	2629.6	30300.00
9	4025.50	34.40	1.445	0.30(0.26)	0.87	2760.1	21400.00
10	4381.58	49.58	1.187	0.30(0.26)	0.85	4317.1	13210.00
11	4388.06	49.85	1.183	0.30(0.26)	0.85	4342.1	13200.00
12	4384.69	51.64	1.160	0.30(0.25)	0.85	4468.2	13100.00
13	3954.27	78.05	0.953	0.30(0.25)	0.84	5733.3	13000.00
14	3901.69	80.44	0.940	0.30(0.25)	0.84	5753.2	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 4388.06 Tc(MIN.) = 49.85
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.85 EFFECTIVE AREA(ACRES) = 4342.13

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610305W.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	766.89	22.44	0.30(0.30)	1.00	540.9	30520.00
2	763.80	23.87	0.30(0.30)	1.00	564.9	30540.00
3	743.35	25.25	0.30(0.30)	1.00	575.9	30510.00
4	718.92	26.75	0.30(0.30)	1.00	582.8	30500.00

TOTAL AREA(ACRES) = 582.8

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3484.88	22.33	1.881	0.30(0.27)	0.89	1401.4	21300.00
2	3535.35	23.35	1.829	0.30(0.27)	0.89	1485.2	30410.00
3	3618.23	25.30	1.732	0.30(0.27)	0.89	1634.7	30210.00
4	3656.43	25.60	1.719	0.30(0.27)	0.89	1676.4	30200.00
5	3825.84	27.60	1.635	0.30(0.26)	0.88	1938.8	30100.00
6	3838.76	28.11	1.613	0.30(0.26)	0.88	2002.3	30400.00
7	3881.77	30.14	1.530	0.30(0.26)	0.88	2248.1	30110.00
8	3994.55	33.25	1.468	0.30(0.26)	0.87	2629.6	30300.00
9	4025.50	34.40	1.445	0.30(0.26)	0.87	2760.1	21400.00
10	4381.58	49.58	1.187	0.30(0.26)	0.85	4317.1	13210.00
11	4388.06	49.85	1.183	0.30(0.26)	0.85	4342.1	13200.00
12	4384.69	51.64	1.160	0.30(0.25)	0.85	4468.2	13100.00
13	3954.27	78.05	0.953	0.30(0.25)	0.84	5733.3	13000.00
14	3901.69	80.44	0.940	0.30(0.25)	0.84	5753.2	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	766.89	22.44	1.875	0.30(0.30)	1.00	540.9	30520.00
2	763.80	23.87	1.802	0.30(0.30)	1.00	564.9	30540.00
3	743.35	25.25	1.734	0.30(0.30)	1.00	575.9	30510.00
4	718.92	26.75	1.671	0.30(0.30)	1.00	582.8	30500.00

LONGEST FLOWPATH FROM NODE 30500.00 TO NODE 13305.00 = 9458.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4250.78	22.33	1.881	0.30(0.28)	0.92	1939.8	21300.00
2	4256.94	22.44	1.875	0.30(0.28)	0.92	1950.9	30520.00
3	4300.26	23.35	1.829	0.30(0.28)	0.92	2041.5	30410.00
4	4321.15	23.87	1.802	0.30(0.28)	0.92	2089.8	30540.00
5	4359.46	25.25	1.734	0.30(0.28)	0.92	2206.8	30510.00
6	4360.77	25.30	1.732	0.30(0.28)	0.92	2210.9	30210.00
7	4394.13	25.60	1.719	0.30(0.28)	0.92	2254.0	30200.00
8	4473.14	26.75	1.671	0.30(0.27)	0.91	2410.7	30500.00
9	4525.99	27.60	1.635	0.30(0.27)	0.91	2521.7	30100.00
10	4527.58	28.11	1.613	0.30(0.27)	0.91	2585.1	30400.00
11	4527.18	30.14	1.530	0.30(0.27)	0.90	2831.0	30110.00
12	4607.30	33.25	1.468	0.30(0.27)	0.90	3212.4	30300.00
13	4626.09	34.40	1.445	0.30(0.27)	0.89	3343.0	21400.00
14	4846.65	49.58	1.187	0.30(0.26)	0.87	4899.9	13210.00
15	4851.01	49.85	1.183	0.30(0.26)	0.87	4925.0	13200.00
16	4835.66	51.64	1.160	0.30(0.26)	0.87	5051.0	13100.00
17	4296.83	78.05	0.953	0.30(0.26)	0.85	6316.2	13000.00
18	4237.16	80.44	0.940	0.30(0.26)	0.85	6336.1	13010.00

TOTAL AREA(ACRES) = 6336.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4851.01 Tc(MIN.) = 49.848
EFFECTIVE AREA(ACRES) = 4924.97 AREA-AVERAGED Fm(INCH/HR) = 0.26

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90
TOTAL AREA(ACRES) = 6336.1
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.20 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 315.00 DOWNSTREAM(FEET) = 284.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1317.91 CHANNEL SLOPE = 0.0235
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.12
CHANNEL FLOW THRU SUBAREA(CFS) = 4851.01
FLOW VELOCITY(FEET/SEC.) = 14.51 FLOW DEPTH(FEET) = 5.12
TRAVEL TIME(MIN.) = 1.51 Tc(MIN.) = 51.36
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4250.78	23.91	1.800	0.30(0.28)	0.92	1939.8	21300.00
2	4256.94	24.02	1.795	0.30(0.28)	0.92	1950.9	30520.00
3	4300.26	24.92	1.748	0.30(0.28)	0.92	2041.5	30410.00
4	4321.15	25.44	1.726	0.30(0.28)	0.92	2089.8	30540.00
5	4359.46	26.82	1.668	0.30(0.28)	0.92	2206.8	30510.00
6	4360.77	26.87	1.666	0.30(0.28)	0.92	2210.9	30210.00
7	4394.13	27.16	1.653	0.30(0.28)	0.92	2254.0	30200.00
8	4473.14	28.31	1.605	0.30(0.27)	0.91	2410.7	30500.00
9	4525.99	29.15	1.569	0.30(0.27)	0.91	2521.7	30100.00
10	4527.58	29.66	1.548	0.30(0.27)	0.91	2585.1	30400.00
11	4527.18	31.69	1.499	0.30(0.27)	0.90	2831.0	30110.00
12	4607.30	34.79	1.437	0.30(0.27)	0.90	3212.4	30300.00
13	4626.09	35.94	1.414	0.30(0.27)	0.89	3343.0	21400.00
14	4846.65	51.10	1.166	0.30(0.26)	0.87	4899.9	13210.00
15	4851.01	51.36	1.163	0.30(0.26)	0.87	4925.0	13200.00
16	4835.66	53.15	1.141	0.30(0.26)	0.87	5051.0	13100.00
17	4296.83	79.62	0.944	0.30(0.26)	0.85	6316.2	13000.00
18	4237.16	82.02	0.931	0.30(0.26)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 4851.01 Tc(MIN.) = 51.36
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 4924.97

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: 0610306W.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	66.29	18.48	0.30(0.30)	1.00	40.4	30600.00

TOTAL AREA(ACRES) = 40.4

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4250.78	23.91	1.800	0.30(0.28)	0.92	1939.8	21300.00
2	4256.94	24.02	1.795	0.30(0.28)	0.92	1950.9	30520.00
3	4300.26	24.92	1.748	0.30(0.28)	0.92	2041.5	30410.00
4	4321.15	25.44	1.726	0.30(0.28)	0.92	2089.8	30540.00
5	4359.46	26.82	1.668	0.30(0.28)	0.92	2206.8	30510.00
6	4360.77	26.87	1.666	0.30(0.28)	0.92	2210.9	30210.00
7	4394.13	27.16	1.653	0.30(0.28)	0.92	2254.0	30200.00
8	4473.14	28.31	1.605	0.30(0.27)	0.91	2410.7	30500.00
9	4525.99	29.15	1.569	0.30(0.27)	0.91	2521.7	30100.00
10	4527.58	29.66	1.548	0.30(0.27)	0.91	2585.1	30400.00
11	4527.18	31.69	1.499	0.30(0.27)	0.90	2831.0	30110.00
12	4607.30	34.79	1.437	0.30(0.27)	0.90	3212.4	30300.00
13	4626.09	35.94	1.414	0.30(0.27)	0.89	3343.0	21400.00
14	4846.65	51.10	1.166	0.30(0.26)	0.87	4899.9	13210.00
15	4851.01	51.36	1.163	0.30(0.26)	0.87	4925.0	13200.00
16	4835.66	53.15	1.141	0.30(0.26)	0.87	5051.0	13100.00
17	4296.83	79.62	0.944	0.30(0.26)	0.85	6316.2	13000.00
18	4237.16	82.02	0.931	0.30(0.26)	0.85	6336.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	66.29	18.48	2.125	0.30(0.30)	1.00	40.4	30600.00

LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 = 2948.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4053.63	18.48	2.125	0.30(0.28)	0.92	1539.8	30600.00
2	4305.25	23.91	1.800	0.30(0.28)	0.92	1980.2	21300.00
3	4311.22	24.02	1.795	0.30(0.28)	0.92	1991.3	30520.00
4	4352.86	24.92	1.748	0.30(0.28)	0.92	2081.8	30410.00
5	4372.94	25.44	1.726	0.30(0.28)	0.92	2130.2	30540.00
6	4409.13	26.82	1.668	0.30(0.28)	0.92	2247.2	30510.00
7	4410.36	26.87	1.666	0.30(0.28)	0.92	2251.2	30210.00
8	4443.28	27.16	1.653	0.30(0.28)	0.92	2294.3	30200.00
9	4520.53	28.31	1.605	0.30(0.27)	0.91	2451.1	30500.00
10	4572.09	29.15	1.569	0.30(0.27)	0.91	2562.0	30100.00
11	4572.88	29.66	1.548	0.30(0.27)	0.91	2625.4	30400.00
12	4570.74	31.69	1.499	0.30(0.27)	0.90	2871.3	30110.00
13	4648.60	34.79	1.437	0.30(0.27)	0.90	3252.8	30300.00
14	4666.55	35.94	1.414	0.30(0.27)	0.90	3383.3	21400.00

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    15     4878.11   51.10    1.166  0.30( 0.26) 0.87    4940.3   13210.00
    16     4882.35   51.36    1.163  0.30( 0.26) 0.87    4965.3   13200.00
    17     4866.19   53.15    1.141  0.30( 0.26) 0.87    5091.4   13100.00
    18     4320.22   79.62    0.944  0.30( 0.26) 0.86    6356.5   13000.00
    19     4260.06   82.02    0.931  0.30( 0.26) 0.85    6376.4   13010.00
   TOTAL AREA(ACRES) =      6376.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4882.35  Tc(MIN.) =   51.362
  EFFECTIVE AREA(ACRES) =   4965.32  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =     6376.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.20 =   43204.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.20 TO NODE  13305.40 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    284.00  DOWNSTREAM(FEET) =    274.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   826.37   CHANNEL SLOPE =  0.0121
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.17
  CHANNEL FLOW THRU SUBAREA(CFS) =    4882.35
  FLOW VELOCITY(FEET/SEC.) =  11.55   FLOW DEPTH(FEET) =   6.17
  TRAVEL TIME(MIN.) =   1.19   Tc(MIN.) =   52.55
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4053.63   19.75    2.021  0.30( 0.28) 0.92    1539.8   30600.00
      2     4305.25   25.15    1.738  0.30( 0.28) 0.92    1980.2   21300.00
      3     4311.22   25.25    1.734  0.30( 0.28) 0.92    1991.3   30520.00
      4     4352.86   26.16    1.696  0.30( 0.28) 0.92    2081.8   30410.00
      5     4372.94   26.67    1.674  0.30( 0.28) 0.92    2130.2   30540.00
      6     4409.13   28.05    1.616  0.30( 0.28) 0.92    2247.2   30510.00
      7     4410.36   28.10    1.614  0.30( 0.28) 0.92    2251.2   30210.00
      8     4443.28   28.39    1.601  0.30( 0.28) 0.92    2294.3   30200.00
      9     4520.53   29.53    1.553  0.30( 0.27) 0.91    2451.1   30500.00
     10     4572.09   30.36    1.526  0.30( 0.27) 0.91    2562.0   30100.00
     11     4572.88   30.87    1.516  0.30( 0.27) 0.91    2625.4   30400.00
     12     4570.74   32.90    1.475  0.30( 0.27) 0.90    2871.3   30110.00
     13     4648.60   36.00    1.413  0.30( 0.27) 0.90    3252.8   30300.00
     14     4666.55   37.15    1.390  0.30( 0.27) 0.90    3383.3   21400.00
     15     4878.11   52.29    1.152  0.30( 0.26) 0.87    4940.3   13210.00
     16     4882.35   52.55    1.148  0.30( 0.26) 0.87    4965.3   13200.00
     17     4866.19   54.35    1.126  0.30( 0.26) 0.87    5091.4   13100.00
     18     4320.22   80.86    0.937  0.30( 0.26) 0.86    6356.5   13000.00
     19     4260.06   83.27    0.924  0.30( 0.26) 0.85    6376.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    4882.35  Tc(MIN.) =   52.55
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    4965.32

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  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610307W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      165.12   17.92  0.30( 0.30) 1.00      98.0   30700.00
    TOTAL AREA(ACRES) =       98.0

****************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4053.63   19.75    2.021  0.30( 0.28) 0.92    1539.8   30600.00
      2     4305.25   25.15    1.738  0.30( 0.28) 0.92    1980.2   21300.00
      3     4311.22   25.25    1.734  0.30( 0.28) 0.92    1991.3   30520.00
      4     4352.86   26.16    1.696  0.30( 0.28) 0.92    2081.8   30410.00
      5     4372.94   26.67    1.674  0.30( 0.28) 0.92    2130.2   30540.00
      6     4409.13   28.05    1.616  0.30( 0.28) 0.92    2247.2   30510.00
      7     4410.36   28.10    1.614  0.30( 0.28) 0.92    2251.2   30210.00
      8     4443.28   28.39    1.601  0.30( 0.28) 0.92    2294.3   30200.00
      9     4520.53   29.53    1.553  0.30( 0.27) 0.91    2451.1   30500.00
     10     4572.09   30.36    1.526  0.30( 0.27) 0.91    2562.0   30100.00
     11     4572.88   30.87    1.516  0.30( 0.27) 0.91    2625.4   30400.00
     12     4570.74   32.90    1.475  0.30( 0.27) 0.90    2871.3   30110.00
     13     4648.60   36.00    1.413  0.30( 0.27) 0.90    3252.8   30300.00
     14     4666.55   37.15    1.390  0.30( 0.27) 0.90    3383.3   21400.00
     15     4878.11   52.29    1.152  0.30( 0.26) 0.87    4940.3   13210.00
     16     4882.35   52.55    1.148  0.30( 0.26) 0.87    4965.3   13200.00
     17     4866.19   54.35    1.126  0.30( 0.26) 0.87    5091.4   13100.00
     18     4320.22   80.86    0.937  0.30( 0.26) 0.86    6356.5   13000.00
     19     4260.06   83.27    0.924  0.30( 0.26) 0.85    6376.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      165.12   17.92    2.172  0.30( 0.30) 1.00      98.0   30700.00
  LONGEST FLOWPATH FROM NODE  30700.00 TO NODE  13305.40 =    5192.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4163.39   17.92    2.172  0.30( 0.28) 0.93    1495.3   30700.00
      2     4205.39   19.75    2.021  0.30( 0.28) 0.93    1637.8   30600.00
```

3	4432.10	25.15	1.738	0.30(0.28)	0.93	2078.2	21300.00
4	4437.68	25.25	1.734	0.30(0.28)	0.93	2089.3	30520.00
5	4475.95	26.16	1.696	0.30(0.28)	0.93	2179.8	30410.00
6	4494.12	26.67	1.674	0.30(0.28)	0.93	2228.2	30540.00
7	4525.18	28.05	1.616	0.30(0.28)	0.92	2345.2	30510.00
8	4526.23	28.10	1.614	0.30(0.28)	0.92	2349.2	30210.00
9	4558.07	28.39	1.601	0.30(0.28)	0.92	2392.3	30200.00
10	4631.06	29.53	1.553	0.30(0.28)	0.92	2549.1	30500.00
11	4680.22	30.36	1.526	0.30(0.27)	0.91	2660.0	30100.00
12	4680.11	30.87	1.516	0.30(0.27)	0.91	2723.4	30400.00
13	4674.38	32.90	1.475	0.30(0.27)	0.91	2969.3	30110.00
14	4746.77	36.00	1.413	0.30(0.27)	0.90	3350.8	30300.00
15	4762.69	37.15	1.390	0.30(0.27)	0.90	3481.3	21400.00
16	4953.22	52.29	1.152	0.30(0.26)	0.87	5038.3	13210.00
17	4957.16	52.55	1.148	0.30(0.26)	0.87	5063.3	13200.00
18	4939.02	54.35	1.126	0.30(0.26)	0.87	5189.4	13100.00
19	4376.42	80.86	0.937	0.30(0.26)	0.86	6454.5	13000.00
20	4315.06	83.27	0.924	0.30(0.26)	0.86	6474.4	13010.00

TOTAL AREA(ACRES) = 6474.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4957.16 Tc(MIN.) = 52.554
EFFECTIVE AREA(ACRES) = 5063.33 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87
TOTAL AREA(ACRES) = 6474.4
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.60 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 274.00 DOWNSTREAM(FEET) = 258.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 733.85 CHANNEL SLOPE = 0.0218
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.29
CHANNEL FLOW THRU SUBAREA(CFS) = 4957.16
FLOW VELOCITY(FEET/SEC.) = 14.23 FLOW DEPTH(FEET) = 5.29
TRAVEL TIME(MIN.) = 0.86 Tc(MIN.) = 53.41
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4163.39	18.83	2.097	0.30(0.28)	0.93	1495.3	30700.00
2	4205.39	20.65	1.966	0.30(0.28)	0.93	1637.8	30600.00
3	4432.10	26.04	1.701	0.30(0.28)	0.93	2078.2	21300.00
4	4437.68	26.14	1.696	0.30(0.28)	0.93	2089.3	30520.00
5	4475.95	27.05	1.658	0.30(0.28)	0.93	2179.8	30410.00
6	4494.12	27.56	1.636	0.30(0.28)	0.93	2228.2	30540.00
7	4525.18	28.93	1.578	0.30(0.28)	0.92	2345.2	30510.00
8	4526.23	28.98	1.576	0.30(0.28)	0.92	2349.2	30210.00
9	4558.07	29.27	1.564	0.30(0.28)	0.92	2392.3	30200.00
10	4631.06	30.40	1.525	0.30(0.28)	0.92	2549.1	30500.00
11	4680.22	31.24	1.508	0.30(0.27)	0.91	2660.0	30100.00
12	4680.11	31.75	1.498	0.30(0.27)	0.91	2723.4	30400.00

13	4674.38	33.78	1.457	0.30(0.27)	0.91	2969.3	30110.00
14	4746.77	36.87	1.396	0.30(0.27)	0.90	3350.8	30300.00
15	4762.69	38.02	1.373	0.30(0.27)	0.90	3481.3	21400.00
16	4953.22	53.15	1.141	0.30(0.26)	0.87	5038.3	13210.00
17	4957.16	53.41	1.137	0.30(0.26)	0.87	5063.3	13200.00
18	4939.02	55.21	1.115	0.30(0.26)	0.87	5189.4	13100.00
19	4376.42	81.75	0.932	0.30(0.26)	0.86	6454.5	13000.00
20	4315.06	84.17	0.919	0.30(0.26)	0.86	6474.4	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 4957.16 Tc(MIN.) = 53.41
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 5063.33

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610308W.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	111.67	17.41	0.30(0.30)	1.00	64.8	30800.00

TOTAL AREA(ACRES) = 64.8

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4163.39	18.83	2.097	0.30(0.28)	0.93	1495.3	30700.00
2	4205.39	20.65	1.966	0.30(0.28)	0.93	1637.8	30600.00
3	4432.10	26.04	1.701	0.30(0.28)	0.93	2078.2	21300.00
4	4437.68	26.14	1.696	0.30(0.28)	0.93	2089.3	30520.00
5	4475.95	27.05	1.658	0.30(0.28)	0.93	2179.8	30410.00
6	4494.12	27.56	1.636	0.30(0.28)	0.93	2228.2	30540.00
7	4525.18	28.93	1.578	0.30(0.28)	0.92	2345.2	30510.00
8	4526.23	28.98	1.576	0.30(0.28)	0.92	2349.2	30210.00
9	4558.07	29.27	1.564	0.30(0.28)	0.92	2392.3	30200.00
10	4631.06	30.40	1.525	0.30(0.28)	0.92	2549.1	30500.00
11	4680.22	31.24	1.508	0.30(0.27)	0.91	2660.0	30100.00
12	4680.11	31.75	1.498	0.30(0.27)	0.91	2723.4	30400.00
13	4674.38	33.78	1.457	0.30(0.27)	0.91	2969.3	30110.00
14	4746.77	36.87	1.396	0.30(0.27)	0.90	3350.8	30300.00
15	4762.69	38.02	1.373	0.30(0.27)	0.90	3481.3	21400.00
16	4953.22	53.15	1.141	0.30(0.26)	0.87	5038.3	13210.00
17	4957.16	53.41	1.137	0.30(0.26)	0.87	5063.3	13200.00
18	4939.02	55.21	1.115	0.30(0.26)	0.87	5189.4	13100.00

```
    19     4376.42   81.75    0.932  0.30( 0.26) 0.86    6454.5   13000.00
    20     4315.06   84.17    0.919  0.30( 0.26) 0.86    6474.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      111.67   17.41    2.214  0.30( 0.30) 1.00      64.8   30800.00
  LONGEST FLOWPATH FROM NODE  30800.00 TO NODE  13305.60 =    4165.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4210.74   17.41    2.214  0.30( 0.28) 0.93    1447.8   30800.00
      2     4268.22   18.83    2.097  0.30( 0.28) 0.93    1560.1   30700.00
      3     4302.61   20.65    1.966  0.30( 0.28) 0.93    1702.6   30600.00
      4     4513.81   26.04    1.701  0.30( 0.28) 0.93    2143.0   21300.00
      5     4519.14   26.14    1.696  0.30( 0.28) 0.93    2154.1   30520.00
      6     4555.17   27.05    1.658  0.30( 0.28) 0.93    2244.7   30410.00
      7     4572.08   27.56    1.636  0.30( 0.28) 0.93    2293.0   30540.00
      8     4599.76   28.93    1.578  0.30( 0.28) 0.93    2410.0   30510.00
      9     4600.69   28.98    1.576  0.30( 0.28) 0.92    2414.1   30210.00
     10     4631.82   29.27    1.564  0.30( 0.28) 0.92    2457.1   30200.00
     11     4702.53   30.40    1.525  0.30( 0.28) 0.92    2613.9   30500.00
     12     4750.71   31.24    1.508  0.30( 0.28) 0.92    2724.8   30100.00
     13     4750.01   31.75    1.498  0.30( 0.27) 0.92    2788.3   30400.00
     14     4741.90   33.78    1.457  0.30( 0.27) 0.91    3034.2   30110.00
     15     4810.69   36.87    1.396  0.30( 0.27) 0.90    3415.6   30300.00
     16     4825.26   38.02    1.373  0.30( 0.27) 0.90    3546.1   21400.00
     17     5002.27   53.15    1.141  0.30( 0.26) 0.87    5103.1   13210.00
     18     5006.02   53.41    1.137  0.30( 0.26) 0.87    5128.2   13200.00
     19     4986.56   55.21    1.115  0.30( 0.26) 0.87    5254.2   13100.00
     20     4413.30   81.75    0.932  0.30( 0.26) 0.86    6519.4   13000.00
     21     4351.14   84.17    0.919  0.30( 0.26) 0.86    6539.3   13010.00
    TOTAL AREA(ACRES) =      6539.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5006.02  Tc(MIN.) =   53.414
  EFFECTIVE AREA(ACRES) =   5128.15  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =     6539.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.80 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    254.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.16   CHANNEL SLOPE =  0.0042
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.31
  CHANNEL FLOW THRU SUBAREA(CFS) =    5006.02
  FLOW VELOCITY(FEET/SEC.) =   8.04   FLOW DEPTH(FEET) =   8.31
  TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =   55.38
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.80 =   45711.71 FEET.
```



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  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4210.74   19.48    2.043  0.30( 0.28) 0.93    1447.8   30800.00
      2     4268.22   20.89    1.954  0.30( 0.28) 0.93    1560.1   30700.00
      3     4302.61   22.70    1.862  0.30( 0.28) 0.93    1702.6   30600.00
      4     4513.81   28.07    1.615  0.30( 0.28) 0.93    2143.0   21300.00
      5     4519.14   28.17    1.611  0.30( 0.28) 0.93    2154.1   30520.00
      6     4555.17   29.07    1.573  0.30( 0.28) 0.93    2244.7   30410.00
      7     4572.08   29.58    1.551  0.30( 0.28) 0.93    2293.0   30540.00
      8     4599.76   30.94    1.514  0.30( 0.28) 0.93    2410.0   30510.00
      9     4600.69   30.99    1.513  0.30( 0.28) 0.92    2414.1   30210.00
     10     4631.82   31.28    1.508  0.30( 0.28) 0.92    2457.1   30200.00
     11     4702.53   32.40    1.485  0.30( 0.28) 0.92    2613.9   30500.00
     12     4750.71   33.23    1.468  0.30( 0.28) 0.92    2724.8   30100.00
     13     4750.01   33.74    1.458  0.30( 0.27) 0.92    2788.3   30400.00
     14     4741.90   35.78    1.418  0.30( 0.27) 0.91    3034.2   30110.00
     15     4810.69   38.86    1.356  0.30( 0.27) 0.90    3415.6   30300.00
     16     4825.26   40.01    1.333  0.30( 0.27) 0.90    3546.1   21400.00
     17     5002.27   55.12    1.116  0.30( 0.26) 0.87    5103.1   13210.00
     18     5006.02   55.38    1.113  0.30( 0.26) 0.87    5128.2   13200.00
     19     4986.56   57.17    1.090  0.30( 0.26) 0.87    5254.2   13100.00
     20     4413.30   83.79    0.921  0.30( 0.26) 0.86    6519.4   13000.00
     21     4351.14   86.21    0.907  0.30( 0.26) 0.86    6539.3   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5006.02  Tc(MIN.) =   55.38
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    5128.15

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610309W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      115.21   17.05  0.30( 0.30) 1.00      65.9   30900.00
      2      115.03   17.11  0.30( 0.30) 1.00      65.9   30910.00
    TOTAL AREA(ACRES) =       65.9

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	4210.74	19.48	2.043	0.30(0.28)	0.93	1447.8	30800.00
2	4268.22	20.89	1.954	0.30(0.28)	0.93	1560.1	30700.00
3	4302.61	22.70	1.862	0.30(0.28)	0.93	1702.6	30600.00
4	4513.81	28.07	1.615	0.30(0.28)	0.93	2143.0	21300.00
5	4519.14	28.17	1.611	0.30(0.28)	0.93	2154.1	30520.00
6	4555.17	29.07	1.573	0.30(0.28)	0.93	2244.7	30410.00
7	4572.08	29.58	1.551	0.30(0.28)	0.93	2293.0	30540.00
8	4599.76	30.94	1.514	0.30(0.28)	0.93	2410.0	30510.00
9	4600.69	30.99	1.513	0.30(0.28)	0.92	2414.1	30210.00
10	4631.82	31.28	1.508	0.30(0.28)	0.92	2457.1	30200.00
11	4702.53	32.40	1.485	0.30(0.28)	0.92	2613.9	30500.00
12	4750.71	33.23	1.468	0.30(0.28)	0.92	2724.8	30100.00
13	4750.01	33.74	1.458	0.30(0.27)	0.92	2788.3	30400.00
14	4741.90	35.78	1.418	0.30(0.27)	0.91	3034.2	30110.00
15	4810.69	38.86	1.356	0.30(0.27)	0.90	3415.6	30300.00
16	4825.26	40.01	1.333	0.30(0.27)	0.90	3546.1	21400.00
17	5002.27	55.12	1.116	0.30(0.26)	0.87	5103.1	13210.00
18	5006.02	55.38	1.113	0.30(0.26)	0.87	5128.2	13200.00
19	4986.56	57.17	1.090	0.30(0.26)	0.87	5254.2	13100.00
20	4413.30	83.79	0.921	0.30(0.26)	0.86	6519.4	13000.00
21	4351.14	86.21	0.907	0.30(0.26)	0.86	6539.3	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	115.21	17.05	2.244	0.30(0.30)	1.00	65.9	30900.00
2	115.03	17.11	2.239	0.30(0.30)	1.00	65.9	30910.00

LONGEST FLOWPATH FROM NODE 30900.00 TO NODE 13305.80 = 3403.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4222.22	17.05	2.244	0.30(0.28)	0.94	1333.4	30900.00
2	4225.95	17.11	2.239	0.30(0.28)	0.94	1337.8	30910.00
3	4314.12	19.48	2.043	0.30(0.28)	0.94	1513.7	30800.00
4	4366.36	20.89	1.954	0.30(0.28)	0.93	1626.0	30700.00
5	4395.25	22.70	1.862	0.30(0.28)	0.93	1768.5	30600.00
6	4591.81	28.07	1.615	0.30(0.28)	0.93	2208.9	21300.00
7	4596.89	28.17	1.611	0.30(0.28)	0.93	2220.0	30520.00
8	4630.66	29.07	1.573	0.30(0.28)	0.93	2310.6	30410.00
9	4646.30	29.58	1.551	0.30(0.28)	0.93	2358.9	30540.00
10	4671.80	30.94	1.514	0.30(0.28)	0.93	2475.9	30510.00
11	4672.67	30.99	1.513	0.30(0.28)	0.93	2480.0	30210.00
12	4703.45	31.28	1.508	0.30(0.28)	0.93	2523.0	30200.00
13	4772.83	32.40	1.485	0.30(0.28)	0.92	2679.8	30500.00
14	4820.03	33.23	1.468	0.30(0.28)	0.92	2790.8	30100.00
15	4818.71	33.74	1.458	0.30(0.28)	0.92	2854.2	30400.00
16	4808.19	35.78	1.418	0.30(0.27)	0.91	3100.1	30110.00
17	4873.32	38.86	1.356	0.30(0.27)	0.90	3481.5	30300.00
18	4886.52	40.01	1.333	0.30(0.27)	0.90	3612.0	21400.00
19	5050.68	55.12	1.116	0.30(0.26)	0.88	5169.0	13210.00
20	5054.24	55.38	1.113	0.30(0.26)	0.88	5194.1	13200.00
21	5033.44	57.17	1.090	0.30(0.26)	0.87	5320.1	13100.00
22	4450.12	83.79	0.921	0.30(0.26)	0.86	6585.3	13000.00
23	4387.15	86.21	0.907	0.30(0.26)	0.86	6605.2	13010.00

TOTAL AREA(ACRES) = 6605.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5054.24 Tc(MIN.) = 55.378
EFFECTIVE AREA(ACRES) = 5194.07 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90
TOTAL AREA(ACRES) = 6605.2
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

****
FLOW PROCESS FROM NODE 13305.80 TO NODE 13306.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 254.00 DOWNSTREAM(FEET) = 245.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 583.12 CHANNEL SLOPE = 0.0146
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.00
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.103
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.77	0.30	0.998	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5079.11
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.47
AVERAGE FLOW DEPTH(FEET) = 5.99 TRAVEL TIME(MIN.) = 0.78
Tc(MIN.) = 56.16
SUBAREA AREA(ACRES) = 68.77 SUBAREA RUNOFF(CFS) = 49.74
EFFECTIVE AREA(ACRES) = 5262.84 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88
TOTAL AREA(ACRES) = 6673.9 PEAK FLOW RATE(CFS) = 5054.24
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.98 FLOW VELOCITY(FEET/SEC.) = 12.45
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13306.00 = 46294.83 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4222.22	17.88	2.176	0.30(0.28)	0.94	1402.1	30900.00
2	4225.95	17.94	2.171	0.30(0.28)	0.94	1406.5	30910.00
3	4314.12	20.30	1.985	0.30(0.28)	0.94	1582.5	30800.00
4	4366.36	21.70	1.913	0.30(0.28)	0.94	1694.8	30700.00
5	4395.25	23.52	1.820	0.30(0.28)	0.94	1837.3	30600.00
6	4591.81	28.87	1.581	0.30(0.28)	0.93	2277.7	21300.00
7	4596.89	28.97	1.577	0.30(0.28)	0.93	2288.8	30520.00
8	4630.66	29.87	1.539	0.30(0.28)	0.93	2379.3	30410.00
9	4646.30	30.38	1.526	0.30(0.28)	0.93	2427.7	30540.00
10	4671.80	31.74	1.498	0.30(0.28)	0.93	2544.7	30510.00
11	4672.67	31.79	1.497	0.30(0.28)	0.93	2548.8	30210.00
12	4703.45	32.07	1.492	0.30(0.28)	0.93	2591.8	30200.00
13	4772.83	33.20	1.469	0.30(0.28)	0.92	2748.6	30500.00

```
    14     4820.03   34.02    1.453  0.30( 0.28) 0.92    2859.5   30100.00
    15     4818.71   34.53    1.442  0.30( 0.28) 0.92    2923.0   30400.00
    16     4808.19   36.57    1.402  0.30( 0.27) 0.91    3168.8   30110.00
    17     4873.32   39.64    1.340  0.30( 0.27) 0.91    3550.3   30300.00
    18     4886.52   40.79    1.321  0.30( 0.27) 0.90    3680.8   21400.00
    19     5050.68   55.90    1.106  0.30( 0.26) 0.88    5237.8   13210.00
    20     5054.24   56.16    1.103  0.30( 0.26) 0.88    5262.8   13200.00
    21     5033.44   57.96    1.081  0.30( 0.26) 0.88    5388.9   13100.00
    22     4450.12   84.60    0.916  0.30( 0.26) 0.86    6654.0   13000.00
    23     4387.15   87.03    0.902  0.30( 0.26) 0.86    6673.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5054.24  Tc(MIN.) =   56.16
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5262.84

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13307.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    245.50  DOWNSTREAM(FEET) =    220.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1543.21   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.77
  CHANNEL FLOW THRU SUBAREA(CFS) =    5054.24
  FLOW VELOCITY(FEET/SEC.) =  13.01   FLOW DEPTH(FEET) =   5.77
  TRAVEL TIME(MIN.) =   1.98   Tc(MIN.) =   58.13
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4222.22   19.97    2.002  0.30( 0.28) 0.94    1402.1   30900.00
      2     4225.95   20.03    1.998  0.30( 0.28) 0.94    1406.5   30910.00
      3     4314.12   22.37    1.879  0.30( 0.28) 0.94    1582.5   30800.00
      4     4366.36   23.77    1.807  0.30( 0.28) 0.94    1694.8   30700.00
      5     4395.25   25.58    1.720  0.30( 0.28) 0.94    1837.3   30600.00
      6     4591.81   30.91    1.515  0.30( 0.28) 0.93    2277.7   21300.00
      7     4596.89   31.01    1.513  0.30( 0.28) 0.93    2288.8   30520.00
      8     4630.66   31.90    1.495  0.30( 0.28) 0.93    2379.3   30410.00
      9     4646.30   32.41    1.485  0.30( 0.28) 0.93    2427.7   30540.00
     10     4671.80   33.77    1.458  0.30( 0.28) 0.93    2544.7   30510.00
     11     4672.67   33.82    1.457  0.30( 0.28) 0.93    2548.8   30210.00
     12     4703.45   34.10    1.451  0.30( 0.28) 0.93    2591.8   30200.00
     13     4772.83   35.21    1.429  0.30( 0.28) 0.92    2748.6   30500.00
     14     4820.03   36.03    1.412  0.30( 0.28) 0.92    2859.5   30100.00
     15     4818.71   36.54    1.402  0.30( 0.28) 0.92    2923.0   30400.00
     16     4808.19   38.58    1.361  0.30( 0.27) 0.91    3168.8   30110.00
     17     4873.32   41.64    1.308  0.30( 0.27) 0.91    3550.3   30300.00
     18     4886.52   42.79    1.290  0.30( 0.27) 0.90    3680.8   21400.00
     19     5050.68   57.87    1.082  0.30( 0.26) 0.88    5237.8   13210.00
     20     5054.24   58.13    1.078  0.30( 0.26) 0.88    5262.8   13200.00
     21     5033.44   59.94    1.056  0.30( 0.26) 0.88    5388.9   13100.00
     22     4450.12   86.66    0.904  0.30( 0.26) 0.86    6654.0   13000.00
     23     4387.15   89.09    0.891  0.30( 0.26) 0.86    6673.9   13010.00
  NEW PEAK FLOW DATA ARE:
```



```
  PEAK FLOW RATE(CFS) =    5054.24  Tc(MIN.) =   58.13
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5262.84

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610310W.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      143.21   21.47  0.30( 0.30) 1.00      97.9   31000.00
    TOTAL AREA(ACRES) =       97.9

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4222.22   19.97    2.002  0.30( 0.28) 0.94    1402.1   30900.00
      2     4225.95   20.03    1.998  0.30( 0.28) 0.94    1406.5   30910.00
      3     4314.12   22.37    1.879  0.30( 0.28) 0.94    1582.5   30800.00
      4     4366.36   23.77    1.807  0.30( 0.28) 0.94    1694.8   30700.00
      5     4395.25   25.58    1.720  0.30( 0.28) 0.94    1837.3   30600.00
      6     4591.81   30.91    1.515  0.30( 0.28) 0.93    2277.7   21300.00
      7     4596.89   31.01    1.513  0.30( 0.28) 0.93    2288.8   30520.00
      8     4630.66   31.90    1.495  0.30( 0.28) 0.93    2379.3   30410.00
      9     4646.30   32.41    1.485  0.30( 0.28) 0.93    2427.7   30540.00
     10     4671.80   33.77    1.458  0.30( 0.28) 0.93    2544.7   30510.00
     11     4672.67   33.82    1.457  0.30( 0.28) 0.93    2548.8   30210.00
     12     4703.45   34.10    1.451  0.30( 0.28) 0.93    2591.8   30200.00
     13     4772.83   35.21    1.429  0.30( 0.28) 0.92    2748.6   30500.00
     14     4820.03   36.03    1.412  0.30( 0.28) 0.92    2859.5   30100.00
     15     4818.71   36.54    1.402  0.30( 0.28) 0.92    2923.0   30400.00
     16     4808.19   38.58    1.361  0.30( 0.27) 0.91    3168.8   30110.00
     17     4873.32   41.64    1.308  0.30( 0.27) 0.91    3550.3   30300.00
     18     4886.52   42.79    1.290  0.30( 0.27) 0.90    3680.8   21400.00
     19     5050.68   57.87    1.082  0.30( 0.26) 0.88    5237.8   13210.00
     20     5054.24   58.13    1.078  0.30( 0.26) 0.88    5262.8   13200.00
     21     5033.44   59.94    1.056  0.30( 0.26) 0.88    5388.9   13100.00
     22     4450.12   86.66    0.904  0.30( 0.26) 0.86    6654.0   13000.00
     23     4387.15   89.09    0.891  0.30( 0.26) 0.86    6673.9   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      143.21   21.47    1.925  0.30( 0.30) 1.00      97.9   31000.00
LONGEST FLOWPATH FROM NODE  31000.00 TO NODE  13307.00 =    5162.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     4361.78   19.97    2.002  0.30( 0.28) 0.94    1493.2   30900.00
    2     4365.59   20.03    1.998  0.30( 0.28) 0.94    1497.9   30910.00
    3     4423.21   21.47    1.925  0.30( 0.28) 0.94    1612.3   31000.00
    4     4453.24   22.37    1.879  0.30( 0.28) 0.94    1680.4   30800.00
    5     4499.22   23.77    1.807  0.30( 0.28) 0.94    1792.7   30700.00
    6     4520.41   25.58    1.720  0.30( 0.28) 0.94    1935.2   30600.00
    7     4698.92   30.91    1.515  0.30( 0.28) 0.94    2375.6   21300.00
    8     4703.82   31.01    1.513  0.30( 0.28) 0.94    2386.7   30520.00
    9     4736.01   31.90    1.495  0.30( 0.28) 0.93    2477.2   30410.00
   10     4750.76   32.41    1.485  0.30( 0.28) 0.93    2525.6   30540.00
   11     4773.85   33.77    1.458  0.30( 0.28) 0.93    2642.6   30510.00
   12     4774.64   33.82    1.457  0.30( 0.28) 0.93    2646.6   30210.00
   13     4804.93   34.10    1.451  0.30( 0.28) 0.93    2689.7   30200.00
   14     4872.33   35.21    1.429  0.30( 0.28) 0.93    2846.5   30500.00
   15     4918.09   36.03    1.412  0.30( 0.28) 0.92    2957.4   30100.00
   16     4915.87   36.54    1.402  0.30( 0.28) 0.92    3020.8   30400.00
   17     4901.76   38.58    1.361  0.30( 0.27) 0.92    3266.7   30110.00
   18     4962.17   41.64    1.308  0.30( 0.27) 0.91    3648.2   30300.00
   19     4973.82   42.79    1.290  0.30( 0.27) 0.91    3778.7   21400.00
   20     5119.60   57.87    1.082  0.30( 0.26) 0.88    5335.7   13210.00
   21     5122.87   58.13    1.078  0.30( 0.26) 0.88    5360.7   13200.00
   22     5100.08   59.94    1.056  0.30( 0.26) 0.88    5486.8   13100.00
   23     4503.44   86.66    0.904  0.30( 0.26) 0.86    6751.9   13000.00
   24     4439.26   89.09    0.891  0.30( 0.26) 0.86    6771.8   13010.00
  TOTAL AREA(ACRES) =      6771.8

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     5122.87  Tc(MIN.) =   58.135
 EFFECTIVE AREA(ACRES) =   5360.72  AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
 TOTAL AREA(ACRES) =     6771.8
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    220.00  DOWNSTREAM(FEET) =    212.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.0086
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.95
 CHANNEL FLOW THRU SUBAREA(CFS) =    5122.87
 FLOW VELOCITY(FEET/SEC.) =  10.41   FLOW DEPTH(FEET) =   6.95
 TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =   59.62
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     4361.78   21.52    1.922  0.30( 0.28) 0.94    1493.2   30900.00
    2     4365.59   21.58    1.919  0.30( 0.28) 0.94    1497.9   30910.00
    3     4423.21   23.01    1.846  0.30( 0.28) 0.94    1612.3   31000.00
    4     4453.24   23.92    1.800  0.30( 0.28) 0.94    1680.4   30800.00
    5     4499.22   25.31    1.732  0.30( 0.28) 0.94    1792.7   30700.00
    6     4520.41   27.12    1.655  0.30( 0.28) 0.94    1935.2   30600.00
    7     4698.92   32.43    1.485  0.30( 0.28) 0.94    2375.6   21300.00
    8     4703.82   32.53    1.483  0.30( 0.28) 0.94    2386.7   30520.00
    9     4736.01   33.42    1.465  0.30( 0.28) 0.93    2477.2   30410.00
   10     4750.76   33.92    1.455  0.30( 0.28) 0.93    2525.6   30540.00
   11     4773.85   35.28    1.427  0.30( 0.28) 0.93    2642.6   30510.00
   12     4774.64   35.33    1.426  0.30( 0.28) 0.93    2646.6   30210.00
   13     4804.93   35.61    1.421  0.30( 0.28) 0.93    2689.7   30200.00
   14     4872.33   36.71    1.399  0.30( 0.28) 0.93    2846.5   30500.00
   15     4918.09   37.53    1.382  0.30( 0.28) 0.92    2957.4   30100.00
   16     4915.87   38.04    1.372  0.30( 0.28) 0.92    3020.8   30400.00
   17     4901.76   40.08    1.332  0.30( 0.27) 0.92    3266.7   30110.00
   18     4962.17   43.14    1.285  0.30( 0.27) 0.91    3648.2   30300.00
   19     4973.82   44.29    1.267  0.30( 0.27) 0.91    3778.7   21400.00
   20     5119.60   59.35    1.063  0.30( 0.26) 0.88    5335.7   13210.00
   21     5122.87   59.62    1.060  0.30( 0.26) 0.88    5360.7   13200.00
   22     5100.08   61.42    1.047  0.30( 0.26) 0.88    5486.8   13100.00
   23     4503.44   88.20    0.896  0.30( 0.26) 0.86    6751.9   13000.00
   24     4439.26   90.64    0.883  0.30( 0.26) 0.86    6771.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    5122.87  Tc(MIN.) =   59.62
 AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5360.72

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610212W.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      352.73   34.48  0.30( 0.30) 1.00     342.8   21200.00
   TOTAL AREA(ACRES) =      342.8

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4361.78   21.52    1.922  0.30( 0.28) 0.94    1493.2   30900.00
```

```
     2     4365.59   21.58    1.919  0.30( 0.28) 0.94    1497.9   30910.00
     3     4423.21   23.01    1.846  0.30( 0.28) 0.94    1612.3   31000.00
     4     4453.24   23.92    1.800  0.30( 0.28) 0.94    1680.4   30800.00
     5     4499.22   25.31    1.732  0.30( 0.28) 0.94    1792.7   30700.00
     6     4520.41   27.12    1.655  0.30( 0.28) 0.94    1935.2   30600.00
     7     4698.92   32.43    1.485  0.30( 0.28) 0.94    2375.6   21300.00
     8     4703.82   32.53    1.483  0.30( 0.28) 0.94    2386.7   30520.00
     9     4736.01   33.42    1.465  0.30( 0.28) 0.93    2477.2   30410.00
    10     4750.76   33.92    1.455  0.30( 0.28) 0.93    2525.6   30540.00
    11     4773.85   35.28    1.427  0.30( 0.28) 0.93    2642.6   30510.00
    12     4774.64   35.33    1.426  0.30( 0.28) 0.93    2646.6   30210.00
    13     4804.93   35.61    1.421  0.30( 0.28) 0.93    2689.7   30200.00
    14     4872.33   36.71    1.399  0.30( 0.28) 0.93    2846.5   30500.00
    15     4918.09   37.53    1.382  0.30( 0.28) 0.92    2957.4   30100.00
    16     4915.87   38.04    1.372  0.30( 0.28) 0.92    3020.8   30400.00
    17     4901.76   40.08    1.332  0.30( 0.27) 0.92    3266.7   30110.00
    18     4962.17   43.14    1.285  0.30( 0.27) 0.91    3648.2   30300.00
    19     4973.82   44.29    1.267  0.30( 0.27) 0.91    3778.7   21400.00
    20     5119.60   59.35    1.063  0.30( 0.26) 0.88    5335.7   13210.00
    21     5122.87   59.62    1.060  0.30( 0.26) 0.88    5360.7   13200.00
    22     5100.08   61.42    1.047  0.30( 0.26) 0.88    5486.8   13100.00
    23     4503.44   88.20    0.896  0.30( 0.26) 0.86    6751.9   13000.00
    24     4439.26   90.64    0.883  0.30( 0.26) 0.86    6771.8   13010.00
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      352.73   34.48    1.443  0.30( 0.30) 1.00     342.8   21200.00
LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  13308.00 =   11049.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     4674.09   21.52    1.922  0.30( 0.28) 0.95    1707.1   30900.00
    2     4678.16   21.58    1.919  0.30( 0.28) 0.95    1712.4   30910.00
    3     4741.49   23.01    1.846  0.30( 0.28) 0.95    1841.1   31000.00
    4     4774.17   23.92    1.800  0.30( 0.28) 0.95    1918.2   30800.00
    5     4823.35   25.31    1.732  0.30( 0.28) 0.95    2044.3   30700.00
    6     4849.15   27.12    1.655  0.30( 0.28) 0.95    2204.8   30600.00
    7     5042.56   32.43    1.485  0.30( 0.28) 0.94    2697.9   21300.00
    8     5047.93   32.53    1.483  0.30( 0.28) 0.94    2710.0   30520.00
    9     5084.23   33.42    1.465  0.30( 0.28) 0.94    2809.4   30410.00
   10     5101.15   33.92    1.455  0.30( 0.28) 0.94    2862.8   30540.00
   11     5113.05   34.48    1.443  0.30( 0.28) 0.94    2916.8   21200.00
   12     5121.65   35.28    1.427  0.30( 0.28) 0.94    2985.4   30510.00
   13     5122.14   35.33    1.426  0.30( 0.28) 0.94    2989.4   30210.00
   14     5150.71   35.61    1.421  0.30( 0.28) 0.94    3032.5   30200.00
   15     5211.28   36.71    1.399  0.30( 0.28) 0.93    3189.3   30500.00
   16     5251.99   37.53    1.382  0.30( 0.28) 0.93    3300.2   30100.00
   17     5246.62   38.04    1.372  0.30( 0.28) 0.93    3363.6   30400.00
   18     5220.04   40.08    1.332  0.30( 0.28) 0.92    3609.5   30110.00
   19     5266.03   43.14    1.285  0.30( 0.27) 0.92    3990.9   30300.00
   20     5272.28   44.29    1.267  0.30( 0.27) 0.91    4121.5   21400.00
   21     5354.97   59.35    1.063  0.30( 0.27) 0.89    5678.4   13210.00
   22     5357.23   59.62    1.060  0.30( 0.27) 0.89    5703.5   13200.00
   23     5330.49   61.42    1.047  0.30( 0.27) 0.88    5829.5   13100.00
   24     4687.23   88.20    0.896  0.30( 0.26) 0.87    7094.7   13000.00
```



```
     25     4619.19   90.64    0.883  0.30( 0.26) 0.87    7114.6   13010.00
    TOTAL AREA(ACRES) =      7114.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5357.23  Tc(MIN.) =   59.617
  EFFECTIVE AREA(ACRES) =   5703.50  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.89
  TOTAL AREA(ACRES) =     7114.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S29.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    19504.09   18.40  0.30( 0.30) 0.99    3495.8   50400.00
      2    22039.21   28.01  0.30( 0.30) 0.99    6203.3   31100.00
      3    24486.36   38.97  0.30( 0.30) 0.99    9555.7   12710.00
      4    25435.10   46.77  0.30( 0.30) 0.99   12463.5   31400.00
      5    26413.13   55.38  0.30( 0.30) 0.99   15642.8   40100.00
      6    28081.52   64.70  0.30( 0.30) 0.99   18945.5   11801.00
      7    30263.21   75.50  0.30( 0.30) 0.99   23473.0   11530.00
      8    31483.37   84.18  0.30( 0.30) 0.99   28104.2   11910.00
      9    33469.92   94.26  0.30( 0.30) 0.99   34432.6   11350.00
     10    34044.02   98.99  0.30( 0.30) 0.99   37605.8   11130.00
     11    33874.63  105.04  0.30( 0.30) 0.99   40532.9   12300.00
     12    33759.80  108.93  0.30( 0.30) 0.99   42595.0   11620.00
     13    33419.25  113.77  0.30( 0.30) 0.99   44793.5   12400.00
     14    32617.75  123.21  0.30( 0.30) 0.99   48194.9   12201.00
     15    31817.43  130.61  0.30( 0.30) 0.99   50087.5   12231.00
     16    30979.78  138.01  0.30( 0.30) 0.99   51641.5   10400.00
     17    29633.68  147.31  0.30( 0.30) 0.99   53086.8   12010.00
     18    28720.68  152.60  0.30( 0.30) 0.99   53350.4   10210.00
     19    28154.27  156.54  0.30( 0.30) 0.99   53495.5   12000.00
     20    24926.01  182.57  0.30( 0.30) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =    54110.0
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    19504.09   18.40  0.30( 0.30) 0.99    3495.8   50400.00
      2    22039.21   28.01  0.30( 0.30) 0.99    6203.3   31100.00
      3    24486.36   38.97  0.30( 0.30) 0.99    9555.7   12710.00
      4    25435.10   46.77  0.30( 0.30) 0.99   12463.5   31400.00
      5    26413.13   55.38  0.30( 0.30) 0.99   15642.8   40100.00
      6    28081.52   64.70  0.30( 0.30) 0.99   18945.5   11801.00
      7    30263.21   75.50  0.30( 0.30) 0.99   23473.0   11530.00
      8    31483.37   84.18  0.30( 0.30) 0.99   28104.2   11910.00
      9    33469.92   94.26  0.30( 0.30) 0.99   34432.6   11350.00
     10    34044.02   98.99  0.30( 0.30) 0.99   37605.8   11130.00
     11    33874.63  105.04  0.30( 0.30) 0.99   40532.9   12300.00
     12    33759.80  108.93  0.30( 0.30) 0.99   42595.0   11620.00
     13    33419.25  113.77  0.30( 0.30) 0.99   44793.5   12400.00
     14    32617.75  123.21  0.30( 0.30) 0.99   48194.9   12201.00
     15    31817.43  130.61  0.30( 0.30) 0.99   50087.5   12231.00
     16    30979.78  138.01  0.30( 0.30) 0.99   51641.5   10400.00
     17    29633.68  147.31  0.30( 0.30) 0.99   53086.8   12010.00
     18    28720.68  152.60  0.30( 0.30) 0.99   53350.4   10210.00
     19    28154.27  156.54  0.30( 0.30) 0.99   53495.5   12000.00
     20    24926.01  182.57  0.30( 0.30) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =     54110.0

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  13308.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    213.00  DOWNSTREAM(FEET) =    212.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1389.52   CHANNEL SLOPE =  0.0007
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.61
  CHANNEL FLOW THRU SUBAREA(CFS) =   34044.02
  FLOW VELOCITY(FEET/SEC.) =   7.24   FLOW DEPTH(FEET) =  16.61
  TRAVEL TIME(MIN.) =   3.20   Tc(MIN.) =  102.18
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19504.09   22.19    1.888  0.30( 0.30) 0.99    3495.8   50400.00
      2    22039.21   31.66    1.500  0.30( 0.30) 0.99    6203.3   31100.00
      3    24486.36   42.51    1.295  0.30( 0.30) 0.99    9555.7   12710.00
      4    25435.10   50.26    1.177  0.30( 0.30) 0.99   12463.5   31400.00
      5    26413.13   58.84    1.069  0.30( 0.30) 0.99   15642.8   40100.00
      6    28081.52   68.09    1.009  0.30( 0.30) 0.99   18945.5   11801.00
      7    30263.21   78.82    0.949  0.30( 0.30) 0.99   23473.0   11530.00
```



```
      8    31483.37   87.45    0.900  0.30( 0.30) 0.99   28104.2   11910.00
      9    33469.92   97.47    0.858  0.30( 0.30) 0.99   34432.6   11350.00
     10    34044.02  102.18    0.841  0.30( 0.30) 0.99   37605.8   11130.00
     11    33874.63  108.24    0.818  0.30( 0.30) 0.99   40532.9   12300.00
     12    33759.80  112.13    0.804  0.30( 0.30) 0.99   42595.0   11620.00
     13    33419.25  116.98    0.786  0.30( 0.30) 0.99   44793.5   12400.00
     14    32617.75  126.44    0.761  0.30( 0.30) 0.99   48194.9   12201.00
     15    31817.43  133.87    0.745  0.30( 0.30) 0.99   50087.5   12231.00
     16    30979.78  141.30    0.729  0.30( 0.30) 0.99   51641.5   10400.00
     17    29633.68  150.64    0.709  0.30( 0.30) 0.99   53086.8   12010.00
     18    28720.68  155.97    0.697  0.30( 0.30) 0.99   53350.4   10210.00
     19    28154.27  159.92    0.689  0.30( 0.30) 0.99   53495.5   12000.00
     20    24926.01  186.09    0.639  0.30( 0.30) 0.99   54110.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   34044.02  Tc(MIN.) =  102.18
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   37605.75

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19504.09   22.19    1.888  0.30( 0.30) 0.99    3495.8   50400.00
      2    22039.21   31.66    1.500  0.30( 0.30) 0.99    6203.3   31100.00
      3    24486.36   42.51    1.295  0.30( 0.30) 0.99    9555.7   12710.00
      4    25435.10   50.26    1.177  0.30( 0.30) 0.99   12463.5   31400.00
      5    26413.13   58.84    1.069  0.30( 0.30) 0.99   15642.8   40100.00
      6    28081.52   68.09    1.009  0.30( 0.30) 0.99   18945.5   11801.00
      7    30263.21   78.82    0.949  0.30( 0.30) 0.99   23473.0   11530.00
      8    31483.37   87.45    0.900  0.30( 0.30) 0.99   28104.2   11910.00
      9    33469.92   97.47    0.858  0.30( 0.30) 0.99   34432.6   11350.00
     10    34044.02  102.18    0.841  0.30( 0.30) 0.99   37605.8   11130.00
     11    33874.63  108.24    0.818  0.30( 0.30) 0.99   40532.9   12300.00
     12    33759.80  112.13    0.804  0.30( 0.30) 0.99   42595.0   11620.00
     13    33419.25  116.98    0.786  0.30( 0.30) 0.99   44793.5   12400.00
     14    32617.75  126.44    0.761  0.30( 0.30) 0.99   48194.9   12201.00
     15    31817.43  133.87    0.745  0.30( 0.30) 0.99   50087.5   12231.00
     16    30979.78  141.30    0.729  0.30( 0.30) 0.99   51641.5   10400.00
     17    29633.68  150.64    0.709  0.30( 0.30) 0.99   53086.8   12010.00
     18    28720.68  155.97    0.697  0.30( 0.30) 0.99   53350.4   10210.00
     19    28154.27  159.92    0.689  0.30( 0.30) 0.99   53495.5   12000.00
     20    24926.01  186.09    0.639  0.30( 0.30) 0.99   54110.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4674.09   21.52    1.922  0.30( 0.28) 0.95    1707.1   30900.00
      2     4678.16   21.58    1.919  0.30( 0.28) 0.95    1712.4   30910.00
      3     4741.49   23.01    1.846  0.30( 0.28) 0.95    1841.1   31000.00
      4     4774.17   23.92    1.800  0.30( 0.28) 0.95    1918.2   30800.00
      5     4823.35   25.31    1.732  0.30( 0.28) 0.95    2044.3   30700.00
      6     4849.15   27.12    1.655  0.30( 0.28) 0.95    2204.8   30600.00
```

7	5042.56	32.43	1.485	0.30(0.28)	0.94	2697.9	21300.00
8	5047.93	32.53	1.483	0.30(0.28)	0.94	2710.0	30520.00
9	5084.23	33.42	1.465	0.30(0.28)	0.94	2809.4	30410.00
10	5101.15	33.92	1.455	0.30(0.28)	0.94	2862.8	30540.00
11	5113.05	34.48	1.443	0.30(0.28)	0.94	2916.8	21200.00
12	5121.65	35.28	1.427	0.30(0.28)	0.94	2985.4	30510.00
13	5122.14	35.33	1.426	0.30(0.28)	0.94	2989.4	30210.00
14	5150.71	35.61	1.421	0.30(0.28)	0.94	3032.5	30200.00
15	5211.28	36.71	1.399	0.30(0.28)	0.93	3189.3	30500.00
16	5251.99	37.53	1.382	0.30(0.28)	0.93	3300.2	30100.00
17	5246.62	38.04	1.372	0.30(0.28)	0.93	3363.6	30400.00
18	5220.04	40.08	1.332	0.30(0.28)	0.92	3609.5	30110.00
19	5266.03	43.14	1.285	0.30(0.27)	0.92	3990.9	30300.00
20	5272.28	44.29	1.267	0.30(0.27)	0.91	4121.5	21400.00
21	5354.97	59.35	1.063	0.30(0.27)	0.89	5678.4	13210.00
22	5357.23	59.62	1.060	0.30(0.27)	0.89	5703.5	13200.00
23	5330.49	61.42	1.047	0.30(0.27)	0.88	5829.5	13100.00
24	4687.23	88.20	0.896	0.30(0.26)	0.87	7094.7	13000.00
25	4619.19	90.64	0.883	0.30(0.26)	0.87	7114.6	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23995.30	21.52	1.922	0.30(0.29)	0.97	5097.3	30900.00
2	24016.07	21.58	1.919	0.30(0.29)	0.97	5111.6	30910.00
3	24209.32	22.19	1.888	0.30(0.29)	0.97	5263.2	50400.00
4	24465.38	23.01	1.846	0.30(0.29)	0.97	5571.6	31000.00
5	24740.46	23.92	1.800	0.30(0.29)	0.97	5907.6	30800.00
6	25161.71	25.31	1.732	0.30(0.29)	0.97	6431.1	30700.00
7	25672.30	27.12	1.655	0.30(0.29)	0.97	7109.3	30600.00
8	27054.01	31.66	1.500	0.30(0.29)	0.97	8830.5	31100.00
9	27253.57	32.43	1.485	0.30(0.29)	0.97	9136.6	21300.00
10	27281.55	32.53	1.483	0.30(0.29)	0.97	9179.7	30520.00
11	27519.25	33.42	1.465	0.30(0.29)	0.97	9555.0	30410.00
12	27649.53	33.92	1.455	0.30(0.29)	0.97	9763.6	30540.00
13	27788.58	34.48	1.443	0.30(0.29)	0.97	9991.8	21200.00
14	27977.11	35.28	1.427	0.30(0.29)	0.97	10306.9	30510.00
15	27988.48	35.33	1.426	0.30(0.29)	0.97	10325.8	30210.00
16	28079.85	35.61	1.421	0.30(0.29)	0.97	10454.9	30200.00
17	28390.31	36.71	1.399	0.30(0.29)	0.97	10954.0	30500.00
18	28615.07	37.53	1.382	0.30(0.29)	0.97	11317.1	30100.00
19	28725.00	38.04	1.372	0.30(0.29)	0.97	11538.5	30400.00
20	29157.95	40.08	1.332	0.30(0.29)	0.97	12413.9	30110.00
21	29742.91	42.51	1.295	0.30(0.29)	0.97	13468.0	12710.00
22	29829.59	43.14	1.285	0.30(0.29)	0.97	13783.2	30300.00
23	29976.37	44.29	1.267	0.30(0.29)	0.97	14344.5	21400.00
24	30740.16	50.26	1.177	0.30(0.29)	0.97	17202.3	31400.00
25	31765.25	58.84	1.069	0.30(0.29)	0.96	21267.7	40100.00
26	31861.52	59.35	1.063	0.30(0.29)	0.96	21506.2	13210.00
27	31910.99	59.62	1.060	0.30(0.29)	0.96	21624.7	13200.00
28	32209.28	61.42	1.047	0.30(0.29)	0.96	22394.2	13100.00
29	33251.77	68.09	1.009	0.30(0.29)	0.96	25090.3	11801.00
30	35175.82	78.82	0.949	0.30(0.29)	0.97	30124.4	11530.00
31	36188.46	87.45	0.900	0.30(0.29)	0.97	35163.8	11910.00
32	36318.06	88.20	0.896	0.30(0.29)	0.97	35668.7	13000.00
33	36733.88	90.64	0.883	0.30(0.29)	0.97	37230.0	13010.00
34	37901.73	97.47	0.858	0.30(0.29)	0.97	41547.2	11350.00

35	38346.54	102.18	0.841	0.30(0.29)	0.97	44720.4	11130.00
36	38010.95	108.24	0.818	0.30(0.29)	0.97	47647.5	12300.00
37	37789.46	112.13	0.804	0.30(0.29)	0.98	49709.6	11620.00
38	37315.92	116.98	0.786	0.30(0.29)	0.98	51908.1	12400.00
39	36328.37	126.44	0.761	0.30(0.29)	0.98	55309.5	12201.00
40	35409.04	133.87	0.745	0.30(0.29)	0.98	57202.1	12231.00
41	34452.35	141.30	0.729	0.30(0.29)	0.98	58756.2	10400.00
42	32956.64	150.64	0.709	0.30(0.29)	0.98	60201.4	12010.00
43	31958.31	155.97	0.697	0.30(0.29)	0.98	60465.0	10210.00
44	31328.56	159.92	0.689	0.30(0.29)	0.98	60610.1	12000.00
45	27735.87	186.09	0.639	0.30(0.29)	0.98	61224.6	10100.00

TOTAL AREA(ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 38346.54 Tc(MIN.) = 102.183
EFFECTIVE AREA(ACRES) = 44720.36 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 61224.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 61224.6 TC(MIN.) = 102.18
EFFECTIVE AREA(ACRES) = 44720.36 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.973
PEAK FLOW RATE(CFS) = 38346.54

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23995.30	21.52	1.922	0.30(0.29)	0.97	5097.3	30900.00
2	24016.07	21.58	1.919	0.30(0.29)	0.97	5111.6	30910.00
3	24209.32	22.19	1.888	0.30(0.29)	0.97	5263.2	50400.00
4	24465.38	23.01	1.846	0.30(0.29)	0.97	5571.6	31000.00
5	24740.46	23.92	1.800	0.30(0.29)	0.97	5907.6	30800.00
6	25161.71	25.31	1.732	0.30(0.29)	0.97	6431.1	30700.00
7	25672.30	27.12	1.655	0.30(0.29)	0.97	7109.3	30600.00
8	27054.01	31.66	1.500	0.30(0.29)	0.97	8830.5	31100.00
9	27253.57	32.43	1.485	0.30(0.29)	0.97	9136.6	21300.00
10	27281.55	32.53	1.483	0.30(0.29)	0.97	9179.7	30520.00
11	27519.25	33.42	1.465	0.30(0.29)	0.97	9555.0	30410.00
12	27649.53	33.92	1.455	0.30(0.29)	0.97	9763.6	30540.00
13	27788.58	34.48	1.443	0.30(0.29)	0.97	9991.8	21200.00
14	27977.11	35.28	1.427	0.30(0.29)	0.97	10306.9	30510.00
15	27988.48	35.33	1.426	0.30(0.29)	0.97	10325.8	30210.00
16	28079.85	35.61	1.421	0.30(0.29)	0.97	10454.9	30200.00
17	28390.31	36.71	1.399	0.30(0.29)	0.97	10954.0	30500.00
18	28615.07	37.53	1.382	0.30(0.29)	0.97	11317.1	30100.00
19	28725.00	38.04	1.372	0.30(0.29)	0.97	11538.5	30400.00
20	29157.95	40.08	1.332	0.30(0.29)	0.97	12413.9	30110.00
21	29742.91	42.51	1.295	0.30(0.29)	0.97	13468.0	12710.00
22	29829.59	43.14	1.285	0.30(0.29)	0.97	13783.2	30300.00
23	29976.37	44.29	1.267	0.30(0.29)	0.97	14344.5	21400.00
24	30740.16	50.26	1.177	0.30(0.29)	0.97	17202.3	31400.00
25	31765.25	58.84	1.069	0.30(0.29)	0.96	21267.7	40100.00
26	31861.52	59.35	1.063	0.30(0.29)	0.96	21506.2	13210.00
27	31910.99	59.62	1.060	0.30(0.29)	0.96	21624.7	13200.00
28	32209.28	61.42	1.047	0.30(0.29)	0.96	22394.2	13100.00
29	33251.77	68.09	1.009	0.30(0.29)	0.96	25090.3	11801.00

30	35175.82	78.82	0.949	0.30(0.29)	0.97	30124.4	11530.00
31	36188.46	87.45	0.900	0.30(0.29)	0.97	35163.8	11910.00
32	36318.06	88.20	0.896	0.30(0.29)	0.97	35668.7	13000.00
33	36733.88	90.64	0.883	0.30(0.29)	0.97	37230.0	13010.00
34	37901.73	97.47	0.858	0.30(0.29)	0.97	41547.2	11350.00
35	38346.54	102.18	0.841	0.30(0.29)	0.97	44720.4	11130.00
36	38010.95	108.24	0.818	0.30(0.29)	0.97	47647.5	12300.00
37	37789.46	112.13	0.804	0.30(0.29)	0.98	49709.6	11620.00
38	37315.92	116.98	0.786	0.30(0.29)	0.98	51908.1	12400.00
39	36328.37	126.44	0.761	0.30(0.29)	0.98	55309.5	12201.00
40	35409.04	133.87	0.745	0.30(0.29)	0.98	57202.1	12231.00
41	34452.35	141.30	0.729	0.30(0.29)	0.98	58756.2	10400.00
42	32956.64	150.64	0.709	0.30(0.29)	0.98	60201.4	12010.00
43	31958.31	155.97	0.697	0.30(0.29)	0.98	60465.0	10210.00
44	31328.56	159.92	0.689	0.30(0.29)	0.98	60610.1	12000.00
45	27735.87	186.09	0.639	0.30(0.29)	0.98	61224.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S34.DAT
  TIME/DATE OF STUDY: 09:36 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.811
   2)   10.00;  3.144
   3)   15.00;  2.409
   4)   20.00;  1.996
   5)   25.00;  1.742
   6)   30.00;  1.531
   7)   40.00;  1.331
   8)   50.00;  1.178
   9)   60.00;  1.053
  10)   90.00;  0.883
  11)  120.00;  0.772
  12)  180.00;  0.643
  13)  360.00;  0.473
  14) 1200.00;  0.207
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S33.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    25672.30   27.12  0.30( 0.29) 0.97    7109.3   30600.00
      2    29157.95   40.08  0.30( 0.29) 0.97   12413.9   30110.00
      3    29976.37   44.29  0.30( 0.29) 0.97   14344.5   21400.00
      4    30740.16   50.26  0.30( 0.29) 0.97   17202.3   31400.00
      5    32209.28   61.42  0.30( 0.29) 0.96   22394.2   13100.00
      6    33251.77   68.09  0.30( 0.29) 0.96   25090.3   11801.00
      7    35175.82   78.82  0.30( 0.29) 0.97   30124.4   11530.00
      8    36733.88   90.64  0.30( 0.29) 0.97   37230.0   13010.00
      9    37901.73   97.47  0.30( 0.29) 0.97   41547.2   11350.00
     10    38346.54  102.18  0.30( 0.29) 0.97   44720.4   11130.00
     11    38010.95  108.24  0.30( 0.29) 0.97   47647.5   12300.00
     12    37789.46  112.13  0.30( 0.29) 0.98   49709.6   11620.00
     13    37315.92  116.98  0.30( 0.29) 0.98   51908.1   12400.00
     14    36328.37  126.44  0.30( 0.29) 0.98   55309.5   12201.00
     15    35409.04  133.87  0.30( 0.29) 0.98   57202.1   12231.00
     16    34452.35  141.30  0.30( 0.29) 0.98   58756.2   10400.00
     17    32956.64  150.64  0.30( 0.29) 0.98   60201.4   12010.00
     18    31958.31  155.97  0.30( 0.29) 0.98   60465.0   10210.00
     19    31328.56  159.92  0.30( 0.29) 0.98   60610.1   12000.00
     20    27735.87  186.09  0.30( 0.29) 0.98   61224.6   10100.00
   TOTAL AREA(ACRES) =    61224.6

**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    25672.30   27.12  0.30( 0.29) 0.97    7109.3   30600.00
      2    29157.95   40.08  0.30( 0.29) 0.97   12413.9   30110.00
      3    29976.37   44.29  0.30( 0.29) 0.97   14344.5   21400.00
      4    30740.16   50.26  0.30( 0.29) 0.97   17202.3   31400.00
      5    32209.28   61.42  0.30( 0.29) 0.96   22394.2   13100.00
      6    33251.77   68.09  0.30( 0.29) 0.96   25090.3   11801.00
      7    35175.82   78.82  0.30( 0.29) 0.97   30124.4   11530.00
      8    36733.88   90.64  0.30( 0.29) 0.97   37230.0   13010.00
      9    37901.73   97.47  0.30( 0.29) 0.97   41547.2   11350.00
     10    38346.54  102.18  0.30( 0.29) 0.97   44720.4   11130.00
     11    38010.95  108.24  0.30( 0.29) 0.97   47647.5   12300.00
     12    37789.46  112.13  0.30( 0.29) 0.98   49709.6   11620.00
     13    37315.92  116.98  0.30( 0.29) 0.98   51908.1   12400.00
     14    36328.37  126.44  0.30( 0.29) 0.98   55309.5   12201.00
     15    35409.04  133.87  0.30( 0.29) 0.98   57202.1   12231.00
     16    34452.35  141.30  0.30( 0.29) 0.98   58756.2   10400.00
     17    32956.64  150.64  0.30( 0.29) 0.98   60201.4   12010.00
     18    31958.31  155.97  0.30( 0.29) 0.98   60465.0   10210.00
```

```
    19    31328.56  159.92  0.30( 0.29) 0.98   60610.1   12000.00
    20    27735.87  186.09  0.30( 0.29) 0.98   61224.6   10100.00
   TOTAL AREA(ACRES) =     61224.6

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13402.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    212.00  DOWNSTREAM(FEET) =    209.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   623.02   CHANNEL SLOPE =  0.0048
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.50
  CHANNEL FLOW THRU SUBAREA(CFS) =   38346.54
  FLOW VELOCITY(FEET/SEC.) =  14.46   FLOW DEPTH(FEET) =  10.50
  TRAVEL TIME(MIN.) =   0.72   Tc(MIN.) =  102.90
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25672.30   27.94    1.618  0.30( 0.29) 0.97    7109.3   30600.00
      2    29157.95   40.86    1.318  0.30( 0.29) 0.97   12413.9   30110.00
      3    29976.37   45.06    1.254  0.30( 0.29) 0.97   14344.5   21400.00
      4    30740.16   51.03    1.165  0.30( 0.29) 0.97   17202.3   31400.00
      5    32209.28   62.18    1.041  0.30( 0.29) 0.96   22394.2   13100.00
      6    33251.77   68.84    1.003  0.30( 0.29) 0.96   25090.3   11801.00
      7    35175.82   79.55    0.942  0.30( 0.29) 0.97   30124.4   11530.00
      8    36733.88   91.37    0.878  0.30( 0.29) 0.97   37230.0   13010.00
      9    37901.73   98.19    0.853  0.30( 0.29) 0.97   41547.2   11350.00
     10    38346.54  102.90    0.835  0.30( 0.29) 0.97   44720.4   11130.00
     11    38010.95  108.96    0.813  0.30( 0.29) 0.97   47647.5   12300.00
     12    37789.46  112.85    0.798  0.30( 0.29) 0.98   49709.6   11620.00
     13    37315.92  117.70    0.780  0.30( 0.29) 0.98   51908.1   12400.00
     14    36328.37  127.17    0.757  0.30( 0.29) 0.98   55309.5   12201.00
     15    35409.04  134.61    0.741  0.30( 0.29) 0.98   57202.1   12231.00
     16    34452.35  142.05    0.725  0.30( 0.29) 0.98   58756.2   10400.00
     17    32956.64  151.40    0.704  0.30( 0.29) 0.98   60201.4   12010.00
     18    31958.31  156.73    0.693  0.30( 0.29) 0.98   60465.0   10210.00
     19    31328.56  160.69    0.685  0.30( 0.29) 0.98   60610.1   12000.00
     20    27735.87  186.88    0.636  0.30( 0.29) 0.98   61224.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   38346.54  Tc(MIN.) =  102.90
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   44720.36

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610505W.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      233.86   20.08  0.30( 0.30) 0.99     153.2   50500.00
```



```
    TOTAL AREA(ACRES) =      153.2

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25672.30   27.94    1.618  0.30( 0.29) 0.97    7109.3   30600.00
      2    29157.95   40.86    1.318  0.30( 0.29) 0.97   12413.9   30110.00
      3    29976.37   45.06    1.254  0.30( 0.29) 0.97   14344.5   21400.00
      4    30740.16   51.03    1.165  0.30( 0.29) 0.97   17202.3   31400.00
      5    32209.28   62.18    1.041  0.30( 0.29) 0.96   22394.2   13100.00
      6    33251.77   68.84    1.003  0.30( 0.29) 0.96   25090.3   11801.00
      7    35175.82   79.55    0.942  0.30( 0.29) 0.97   30124.4   11530.00
      8    36733.88   91.37    0.878  0.30( 0.29) 0.97   37230.0   13010.00
      9    37901.73   98.19    0.853  0.30( 0.29) 0.97   41547.2   11350.00
     10    38346.54  102.90    0.835  0.30( 0.29) 0.97   44720.4   11130.00
     11    38010.95  108.96    0.813  0.30( 0.29) 0.97   47647.5   12300.00
     12    37789.46  112.85    0.798  0.30( 0.29) 0.98   49709.6   11620.00
     13    37315.92  117.70    0.780  0.30( 0.29) 0.98   51908.1   12400.00
     14    36328.37  127.17    0.757  0.30( 0.29) 0.98   55309.5   12201.00
     15    35409.04  134.61    0.741  0.30( 0.29) 0.98   57202.1   12231.00
     16    34452.35  142.05    0.725  0.30( 0.29) 0.98   58756.2   10400.00
     17    32956.64  151.40    0.704  0.30( 0.29) 0.98   60201.4   12010.00
     18    31958.31  156.73    0.693  0.30( 0.29) 0.98   60465.0   10210.00
     19    31328.56  160.69    0.685  0.30( 0.29) 0.98   60610.1   12000.00
     20    27735.87  186.88    0.636  0.30( 0.29) 0.98   61224.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      233.86   20.08    1.992  0.30( 0.30) 0.99     153.2   50500.00
  LONGEST FLOWPATH FROM NODE  50500.00 TO NODE  13402.00 =    6247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    23889.59   20.08    1.992  0.30( 0.29) 0.97    5262.9   50500.00
      2    25854.61   27.94    1.618  0.30( 0.29) 0.97    7262.5   30600.00
      3    29298.87   40.86    1.318  0.30( 0.29) 0.97   12567.1   30110.00
      4    30108.42   45.06    1.254  0.30( 0.29) 0.97   14497.7   21400.00
      5    30860.02   51.03    1.165  0.30( 0.29) 0.97   17355.4   31400.00
      6    32311.98   62.18    1.041  0.30( 0.29) 0.96   22547.4   13100.00
      7    33349.27   68.84    1.003  0.30( 0.29) 0.96   25243.4   11801.00
      8    35264.94   79.55    0.942  0.30( 0.29) 0.97   30277.6   11530.00
      9    36814.14   91.37    0.878  0.30( 0.29) 0.97   37383.2   13010.00
     10    37978.52   98.19    0.853  0.30( 0.29) 0.97   41700.4   11350.00
     11    38420.92  102.90    0.835  0.30( 0.29) 0.97   44873.5   11130.00
     12    38082.24  108.96    0.813  0.30( 0.29) 0.97   47800.7   12300.00
     13    37858.77  112.85    0.798  0.30( 0.29) 0.98   49862.7   11620.00
     14    37382.75  117.70    0.780  0.30( 0.29) 0.98   52061.3   12400.00
     15    36391.90  127.17    0.757  0.30( 0.29) 0.98   55462.7   12201.00
     16    35470.37  134.61    0.741  0.30( 0.29) 0.98   57355.3   12231.00
```

```
    17    34511.47  142.05    0.725  0.30( 0.29) 0.98   58909.3   10400.00
    18    33012.99  151.40    0.704  0.30( 0.29) 0.98   60354.6   12010.00
    19    32013.07  156.73    0.693  0.30( 0.29) 0.98   60618.2   10210.00
    20    31382.15  160.69    0.685  0.30( 0.29) 0.98   60763.3   12000.00
    21    27782.84  186.88    0.636  0.30( 0.29) 0.98   61377.8   10100.00
   TOTAL AREA(ACRES) =     61377.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    38420.92  Tc(MIN.) =  102.901
  EFFECTIVE AREA(ACRES) =  44873.54  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61377.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    209.00  DOWNSTREAM(FEET) =    207.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.35   CHANNEL SLOPE =  0.0051
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.37
  CHANNEL FLOW THRU SUBAREA(CFS) =   38420.92
  FLOW VELOCITY(FEET/SEC.) =  14.72   FLOW DEPTH(FEET) =  10.37
  TRAVEL TIME(MIN.) =   0.45   Tc(MIN.) =  103.35
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    23889.59   20.60    1.965  0.30( 0.29) 0.97    5262.9   50500.00
      2    25854.61   28.45    1.596  0.30( 0.29) 0.97    7262.5   30600.00
      3    29298.87   41.35    1.310  0.30( 0.29) 0.97   12567.1   30110.00
      4    30108.42   45.55    1.246  0.30( 0.29) 0.97   14497.7   21400.00
      5    30860.02   51.51    1.159  0.30( 0.29) 0.97   17355.4   31400.00
      6    32311.98   62.65    1.038  0.30( 0.29) 0.96   22547.4   13100.00
      7    33349.27   69.31    1.000  0.30( 0.29) 0.96   25243.4   11801.00
      8    35264.94   80.01    0.940  0.30( 0.29) 0.97   30277.6   11530.00
      9    36814.14   91.82    0.876  0.30( 0.29) 0.97   37383.2   13010.00
     10    37978.52   98.64    0.851  0.30( 0.29) 0.97   41700.4   11350.00
     11    38420.92  103.35    0.834  0.30( 0.29) 0.97   44873.5   11130.00
     12    38082.24  109.41    0.811  0.30( 0.29) 0.97   47800.7   12300.00
     13    37858.77  113.30    0.797  0.30( 0.29) 0.98   49862.7   11620.00
     14    37382.75  118.16    0.779  0.30( 0.29) 0.98   52061.3   12400.00
     15    36391.90  127.63    0.756  0.30( 0.29) 0.98   55462.7   12201.00
     16    35470.37  135.07    0.740  0.30( 0.29) 0.98   57355.3   12231.00
     17    34511.47  142.51    0.724  0.30( 0.29) 0.98   58909.3   10400.00
     18    33012.99  151.87    0.703  0.30( 0.29) 0.98   60354.6   12010.00
     19    32013.07  157.20    0.692  0.30( 0.29) 0.98   60618.2   10210.00
     20    31382.15  161.17    0.683  0.30( 0.29) 0.98   60763.3   12000.00
     21    27782.84  187.38    0.636  0.30( 0.29) 0.98   61377.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   38420.92  Tc(MIN.) =  103.35
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   44873.54
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610506W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       84.62   17.59  0.30( 0.30) 1.00      49.6   50600.00
    TOTAL AREA(ACRES) =       49.6

****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    23889.59   20.60    1.965  0.30( 0.29) 0.97    5262.9   50500.00
      2    25854.61   28.45    1.596  0.30( 0.29) 0.97    7262.5   30600.00
      3    29298.87   41.35    1.310  0.30( 0.29) 0.97   12567.1   30110.00
      4    30108.42   45.55    1.246  0.30( 0.29) 0.97   14497.7   21400.00
      5    30860.02   51.51    1.159  0.30( 0.29) 0.97   17355.4   31400.00
      6    32311.98   62.65    1.038  0.30( 0.29) 0.96   22547.4   13100.00
      7    33349.27   69.31    1.000  0.30( 0.29) 0.96   25243.4   11801.00
      8    35264.94   80.01    0.940  0.30( 0.29) 0.97   30277.6   11530.00
      9    36814.14   91.82    0.876  0.30( 0.29) 0.97   37383.2   13010.00
     10    37978.52   98.64    0.851  0.30( 0.29) 0.97   41700.4   11350.00
     11    38420.92  103.35    0.834  0.30( 0.29) 0.97   44873.5   11130.00
     12    38082.24  109.41    0.811  0.30( 0.29) 0.97   47800.7   12300.00
     13    37858.77  113.30    0.797  0.30( 0.29) 0.98   49862.7   11620.00
     14    37382.75  118.16    0.779  0.30( 0.29) 0.98   52061.3   12400.00
     15    36391.90  127.63    0.756  0.30( 0.29) 0.98   55462.7   12201.00
     16    35470.37  135.07    0.740  0.30( 0.29) 0.98   57355.3   12231.00
     17    34511.47  142.51    0.724  0.30( 0.29) 0.98   58909.3   10400.00
     18    33012.99  151.87    0.703  0.30( 0.29) 0.98   60354.6   12010.00
     19    32013.07  157.20    0.692  0.30( 0.29) 0.98   60618.2   10210.00
     20    31382.15  161.17    0.683  0.30( 0.29) 0.98   60763.3   12000.00
     21    27782.84  187.38    0.636  0.30( 0.29) 0.98   61377.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       84.62   17.59    2.195  0.30( 0.30) 1.00      49.6   50600.00
  LONGEST FLOWPATH FROM NODE  50600.00 TO NODE  13404.00 =    4378.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    23278.83   17.59    2.195  0.30( 0.29) 0.97    4541.4   50600.00
      2    23963.93   20.60    1.965  0.30( 0.29) 0.97    5312.5   50500.00
      3    25912.48   28.45    1.596  0.30( 0.29) 0.97    7312.1   30600.00
      4    29343.97   41.35    1.310  0.30( 0.29) 0.97   12616.6   30110.00
```

5	30150.65	45.55	1.246	0.30(0.29)	0.97	14547.3	21400.00
6	30898.38	51.51	1.159	0.30(0.29)	0.97	17405.0	31400.00
7	32344.92	62.65	1.038	0.30(0.29)	0.96	22596.9	13100.00
8	33380.53	69.31	1.000	0.30(0.29)	0.96	25293.0	11801.00
9	35293.50	80.01	0.940	0.30(0.29)	0.97	30327.2	11530.00
10	36839.87	91.82	0.876	0.30(0.29)	0.97	37432.8	13010.00
11	38003.12	98.64	0.851	0.30(0.29)	0.97	41750.0	11350.00
12	38444.75	103.35	0.834	0.30(0.29)	0.97	44923.1	11130.00
13	38105.06	109.41	0.811	0.30(0.29)	0.97	47850.3	12300.00
14	37880.95	113.30	0.797	0.30(0.29)	0.98	49912.3	11620.00
15	37404.13	118.16	0.779	0.30(0.29)	0.98	52110.9	12400.00
16	36412.24	127.63	0.756	0.30(0.29)	0.98	55512.3	12201.00
17	35489.99	135.07	0.740	0.30(0.29)	0.98	57404.9	12231.00
18	34530.39	142.51	0.724	0.30(0.29)	0.98	58958.9	10400.00
19	33031.01	151.87	0.703	0.30(0.29)	0.98	60404.2	12010.00
20	32030.58	157.20	0.692	0.30(0.29)	0.98	60667.8	10210.00
21	31399.27	161.17	0.683	0.30(0.29)	0.98	60812.9	12000.00
22	27797.85	187.38	0.636	0.30(0.29)	0.98	61427.4	10100.00

TOTAL AREA(ACRES) = 61427.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 38444.75 Tc(MIN.) = 103.349
EFFECTIVE AREA(ACRES) = 44923.13 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 61427.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

****
FLOW PROCESS FROM NODE 13404.00 TO NODE 13406.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 207.00 DOWNSTREAM(FEET) = 195.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1601.97 CHANNEL SLOPE = 0.0075
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.28
CHANNEL FLOW THRU SUBAREA(CFS) = 38444.75
FLOW VELOCITY(FEET/SEC.) = 16.81 FLOW DEPTH(FEET) = 9.28
TRAVEL TIME(MIN.) = 1.59 Tc(MIN.) = 104.94
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23278.83	19.46	2.040	0.30(0.29)	0.97	4541.4	50600.00
2	23963.93	22.46	1.871	0.30(0.29)	0.97	5312.5	50500.00
3	25912.48	30.26	1.526	0.30(0.29)	0.97	7312.1	30600.00
4	29343.97	43.09	1.284	0.30(0.29)	0.97	12616.6	30110.00
5	30150.65	47.27	1.220	0.30(0.29)	0.97	14547.3	21400.00
6	30898.38	53.22	1.138	0.30(0.29)	0.97	17405.0	31400.00
7	32344.92	64.33	1.028	0.30(0.29)	0.96	22596.9	13100.00
8	33380.53	70.97	0.991	0.30(0.29)	0.96	25293.0	11801.00
9	35293.50	81.65	0.930	0.30(0.29)	0.97	30327.2	11530.00
10	36839.87	93.43	0.870	0.30(0.29)	0.97	37432.8	13010.00
11	38003.12	100.23	0.845	0.30(0.29)	0.97	41750.0	11350.00
12	38444.75	104.94	0.828	0.30(0.29)	0.97	44923.1	11130.00

13	38105.06	111.00	0.805	0.30(0.29)	0.97	47850.3	12300.00
14	37880.95	114.90	0.791	0.30(0.29)	0.98	49912.3	11620.00
15	37404.13	119.76	0.773	0.30(0.29)	0.98	52110.9	12400.00
16	36412.24	129.25	0.752	0.30(0.29)	0.98	55512.3	12201.00
17	35489.99	136.70	0.736	0.30(0.29)	0.98	57404.9	12231.00
18	34530.39	144.15	0.720	0.30(0.29)	0.98	58958.9	10400.00
19	33031.01	153.54	0.700	0.30(0.29)	0.98	60404.2	12010.00
20	32030.58	158.89	0.688	0.30(0.29)	0.98	60667.8	10210.00
21	31399.27	162.86	0.680	0.30(0.29)	0.98	60812.9	12000.00
22	27797.85	189.15	0.634	0.30(0.29)	0.98	61427.4	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 38444.75 Tc(MIN.) = 104.94
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 44923.13

****
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610211W.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	188.12	13.01	0.30(0.30)	1.00	87.0	21100.00

TOTAL AREA(ACRES) = 87.0

****
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23278.83	19.46	2.040	0.30(0.29)	0.97	4541.4	50600.00
2	23963.93	22.46	1.871	0.30(0.29)	0.97	5312.5	50500.00
3	25912.48	30.26	1.526	0.30(0.29)	0.97	7312.1	30600.00
4	29343.97	43.09	1.284	0.30(0.29)	0.97	12616.6	30110.00
5	30150.65	47.27	1.220	0.30(0.29)	0.97	14547.3	21400.00
6	30898.38	53.22	1.138	0.30(0.29)	0.97	17405.0	31400.00
7	32344.92	64.33	1.028	0.30(0.29)	0.96	22596.9	13100.00
8	33380.53	70.97	0.991	0.30(0.29)	0.96	25293.0	11801.00
9	35293.50	81.65	0.930	0.30(0.29)	0.97	30327.2	11530.00
10	36839.87	93.43	0.870	0.30(0.29)	0.97	37432.8	13010.00
11	38003.12	100.23	0.845	0.30(0.29)	0.97	41750.0	11350.00
12	38444.75	104.94	0.828	0.30(0.29)	0.97	44923.1	11130.00
13	38105.06	111.00	0.805	0.30(0.29)	0.97	47850.3	12300.00
14	37880.95	114.90	0.791	0.30(0.29)	0.98	49912.3	11620.00
15	37404.13	119.76	0.773	0.30(0.29)	0.98	52110.9	12400.00
16	36412.24	129.25	0.752	0.30(0.29)	0.98	55512.3	12201.00

```
    17    35489.99  136.70    0.736  0.30( 0.29) 0.98   57404.9   12231.00
    18    34530.39  144.15    0.720  0.30( 0.29) 0.98   58958.9   10400.00
    19    33031.01  153.54    0.700  0.30( 0.29) 0.98   60404.2   12010.00
    20    32030.58  158.89    0.688  0.30( 0.29) 0.98   60667.8   10210.00
    21    31399.27  162.86    0.680  0.30( 0.29) 0.98   60812.9   12000.00
    22    27797.85  189.15    0.634  0.30( 0.29) 0.98   61427.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      188.12   13.01    2.702  0.30( 0.30) 1.00      87.0   21100.00
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  13406.00 =    2859.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    21633.11   13.01    2.702  0.30( 0.29) 0.98    3121.7   21100.00
      2    23415.12   19.46    2.040  0.30( 0.29) 0.98    4628.4   50600.00
      3    24086.94   22.46    1.871  0.30( 0.29) 0.98    5399.5   50500.00
      4    26008.48   30.26    1.526  0.30( 0.29) 0.97    7399.1   30600.00
      5    29421.02   43.09    1.284  0.30( 0.29) 0.97   12703.6   30110.00
      6    30222.68   47.27    1.220  0.30( 0.29) 0.97   14634.3   21400.00
      7    30963.98   53.22    1.138  0.30( 0.29) 0.97   17492.0   31400.00
      8    32401.97   64.33    1.028  0.30( 0.29) 0.96   22683.9   13100.00
      9    33434.63   70.97    0.991  0.30( 0.29) 0.96   25380.0   11801.00
     10    35342.86   81.65    0.930  0.30( 0.29) 0.97   30414.2   11530.00
     11    36884.54   93.43    0.870  0.30( 0.29) 0.97   37519.8   13010.00
     12    38045.81  100.23    0.845  0.30( 0.29) 0.97   41837.0   11350.00
     13    38486.08  104.94    0.828  0.30( 0.29) 0.97   45010.1   11130.00
     14    38144.63  111.00    0.805  0.30( 0.29) 0.97   47937.3   12300.00
     15    37919.39  114.90    0.791  0.30( 0.29) 0.98   49999.3   11620.00
     16    37441.16  119.76    0.773  0.30( 0.29) 0.98   52197.9   12400.00
     17    36447.65  129.25    0.752  0.30( 0.29) 0.98   55599.3   12201.00
     18    35524.15  136.70    0.736  0.30( 0.29) 0.98   57491.9   12231.00
     19    34563.29  144.15    0.720  0.30( 0.29) 0.98   59045.9   10400.00
     20    33062.33  153.54    0.700  0.30( 0.29) 0.98   60491.2   12010.00
     21    32060.99  158.89    0.688  0.30( 0.29) 0.98   60754.8   10210.00
     22    31429.02  162.86    0.680  0.30( 0.29) 0.98   60899.9   12000.00
     23    27824.04  189.15    0.634  0.30( 0.29) 0.98   61514.4   10100.00
    TOTAL AREA(ACRES) =     61514.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    38486.08  Tc(MIN.) =  104.937
  EFFECTIVE AREA(ACRES) =  45010.14  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61514.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13408.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    195.00  DOWNSTREAM(FEET) =    182.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2458.36   CHANNEL SLOPE =  0.0053
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.818
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       12.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   38488.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.95
  AVERAGE FLOW DEPTH(FEET) =  10.25   TRAVEL TIME(MIN.) =   2.74
  Tc(MIN.) =  107.68
  SUBAREA AREA(ACRES) =    12.41       SUBAREA RUNOFF(CFS) =    5.78
  EFFECTIVE AREA(ACRES) =  45022.55     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    61526.8         PEAK FLOW RATE(CFS) =   38486.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.25   FLOW VELOCITY(FEET/SEC.) =  14.95
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    21633.11   16.32    2.300  0.30( 0.29) 0.98    3134.1   21100.00
      2    23415.12   22.69    1.859  0.30( 0.29) 0.98    4640.8   50600.00
      3    24086.94   25.66    1.714  0.30( 0.29) 0.98    5411.9   50500.00
      4    26008.48   33.37    1.464  0.30( 0.29) 0.97    7411.5   30600.00
      5    29421.02   46.08    1.238  0.30( 0.29) 0.97   12716.1   30110.00
      6    30222.68   50.24    1.175  0.30( 0.29) 0.97   14646.7   21400.00
      7    30963.98   56.16    1.101  0.30( 0.29) 0.97   17504.4   31400.00
      8    32401.97   67.23    1.012  0.30( 0.29) 0.96   22696.4   13100.00
      9    33434.63   73.84    0.975  0.30( 0.29) 0.96   25392.4   11801.00
     10    35342.86   84.47    0.914  0.30( 0.29) 0.97   30426.6   11530.00
     11    36884.54   96.21    0.860  0.30( 0.29) 0.97   37532.2   13010.00
     12    38045.81  102.98    0.835  0.30( 0.29) 0.97   41849.4   11350.00
     13    38486.08  107.68    0.818  0.30( 0.29) 0.97   45022.5   11130.00
     14    38144.63  113.75    0.795  0.30( 0.29) 0.97   47949.7   12300.00
     15    37919.39  117.65    0.781  0.30( 0.29) 0.98   50011.8   11620.00
     16    37441.16  122.52    0.767  0.30( 0.29) 0.98   52210.3   12400.00
     17    36447.65  132.04    0.746  0.30( 0.29) 0.98   55611.7   12201.00
     18    35524.15  139.51    0.730  0.30( 0.29) 0.98   57504.3   12231.00
     19    34563.29  146.99    0.714  0.30( 0.29) 0.98   59058.3   10400.00
     20    33062.33  156.41    0.694  0.30( 0.29) 0.98   60503.6   12010.00
     21    32060.99  161.80    0.682  0.30( 0.29) 0.98   60767.2   10210.00
     22    31429.02  165.79    0.674  0.30( 0.29) 0.98   60912.3   12000.00
     23    27824.04  192.20    0.631  0.30( 0.29) 0.98   61526.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   38486.08  Tc(MIN.) =  107.68
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   45022.55

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 FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610507W.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      358.70   20.30  0.30( 0.30) 0.99     236.8   50700.00
   TOTAL AREA(ACRES) =      236.8

****************************************************************************
 FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    21633.11   16.32    2.300  0.30( 0.29) 0.98    3134.1   21100.00
     2    23415.12   22.69    1.859  0.30( 0.29) 0.98    4640.8   50600.00
     3    24086.94   25.66    1.714  0.30( 0.29) 0.98    5411.9   50500.00
     4    26008.48   33.37    1.464  0.30( 0.29) 0.97    7411.5   30600.00
     5    29421.02   46.08    1.238  0.30( 0.29) 0.97   12716.1   30110.00
     6    30222.68   50.24    1.175  0.30( 0.29) 0.97   14646.7   21400.00
     7    30963.98   56.16    1.101  0.30( 0.29) 0.97   17504.4   31400.00
     8    32401.97   67.23    1.012  0.30( 0.29) 0.96   22696.4   13100.00
     9    33434.63   73.84    0.975  0.30( 0.29) 0.96   25392.4   11801.00
    10    35342.86   84.47    0.914  0.30( 0.29) 0.97   30426.6   11530.00
    11    36884.54   96.21    0.860  0.30( 0.29) 0.97   37532.2   13010.00
    12    38045.81  102.98    0.835  0.30( 0.29) 0.97   41849.4   11350.00
    13    38486.08  107.68    0.818  0.30( 0.29) 0.97   45022.5   11130.00
    14    38144.63  113.75    0.795  0.30( 0.29) 0.97   47949.7   12300.00
    15    37919.39  117.65    0.781  0.30( 0.29) 0.98   50011.8   11620.00
    16    37441.16  122.52    0.767  0.30( 0.29) 0.98   52210.3   12400.00
    17    36447.65  132.04    0.746  0.30( 0.29) 0.98   55611.7   12201.00
    18    35524.15  139.51    0.730  0.30( 0.29) 0.98   57504.3   12231.00
    19    34563.29  146.99    0.714  0.30( 0.29) 0.98   59058.3   10400.00
    20    33062.33  156.41    0.694  0.30( 0.29) 0.98   60503.6   12010.00
    21    32060.99  161.80    0.682  0.30( 0.29) 0.98   60767.2   10210.00
    22    31429.02  165.79    0.674  0.30( 0.29) 0.98   60912.3   12000.00
    23    27824.04  192.20    0.631  0.30( 0.29) 0.98   61526.8   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      358.70   20.30    1.981  0.30( 0.30) 0.99     236.8   50700.00
 LONGEST FLOWPATH FROM NODE  50700.00 TO NODE  13408.00 =    7903.00 FEET.

 ** PEAK FLOW RATE TABLE **
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  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    21976.16   16.32    2.300  0.30( 0.29) 0.98    3324.4   21100.00
     2    23106.00   20.30    1.981  0.30( 0.29) 0.98    4312.9   50700.00
     3    23747.97   22.69    1.859  0.30( 0.29) 0.98    4877.6   50600.00
     4    24388.84   25.66    1.714  0.30( 0.29) 0.98    5648.7   50500.00
     5    26256.96   33.37    1.464  0.30( 0.29) 0.98    7648.3   30600.00
     6    29621.42   46.08    1.238  0.30( 0.29) 0.97   12952.8   30110.00
     7    30409.68   50.24    1.175  0.30( 0.29) 0.97   14883.5   21400.00
     8    31135.19   56.16    1.101  0.30( 0.29) 0.97   17741.2   31400.00
     9    32554.22   67.23    1.012  0.30( 0.29) 0.96   22933.1   13100.00
    10    33578.89   73.84    0.975  0.30( 0.29) 0.96   25629.2   11801.00
    11    35474.29   84.47    0.914  0.30( 0.29) 0.97   30663.4   11530.00
    12    37004.39   96.21    0.860  0.30( 0.29) 0.97   37768.9   13010.00
    13    38160.32  102.98    0.835  0.30( 0.29) 0.97   42086.2   11350.00
    14    38596.88  107.68    0.818  0.30( 0.29) 0.97   45259.3   11130.00
    15    38250.65  113.75    0.795  0.30( 0.29) 0.97   48186.5   12300.00
    16    38022.34  117.65    0.781  0.30( 0.29) 0.98   50248.5   11620.00
    17    37541.10  122.52    0.767  0.30( 0.29) 0.98   52447.1   12400.00
    18    36543.23  132.04    0.746  0.30( 0.29) 0.98   55848.5   12201.00
    19    35616.30  139.51    0.730  0.30( 0.29) 0.98   57741.1   12231.00
    20    34652.00  146.99    0.714  0.30( 0.29) 0.98   59295.1   10400.00
    21    33146.73  156.41    0.694  0.30( 0.29) 0.98   60740.4   12010.00
    22    32142.93  161.80    0.682  0.30( 0.29) 0.98   61003.9   10210.00
    23    31509.12  165.79    0.674  0.30( 0.29) 0.98   61149.1   12000.00
    24    27895.17  192.20    0.631  0.30( 0.29) 0.98   61763.6   10100.00
   TOTAL AREA(ACRES) =     61763.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    38596.88  Tc(MIN.) =  107.678
 EFFECTIVE AREA(ACRES) =  45259.33  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    61763.6
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13408.00 TO NODE  13410.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    182.00  DOWNSTREAM(FEET) =    178.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =   952.73   CHANNEL SLOPE =  0.0034
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.58
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.813
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        3.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   38597.65
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.93
 AVERAGE FLOW DEPTH(FEET) =  11.58   TRAVEL TIME(MIN.) =   1.23
 Tc(MIN.) =  108.91
 SUBAREA AREA(ACRES) =     3.31       SUBAREA RUNOFF(CFS) =    1.53
```

EFFECTIVE AREA(ACRES) = 45262.64 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 61766.9 PEAK FLOW RATE(CFS) = 38596.88
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.58 FLOW VELOCITY(FEET/SEC.) = 12.93
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21976.16	17.79	2.178	0.30(0.29)	0.98	3327.7	21100.00
2	23106.00	21.75	1.907	0.30(0.29)	0.98	4316.2	50700.00
3	23747.97	24.13	1.786	0.30(0.29)	0.98	4880.9	50600.00
4	24388.84	27.08	1.654	0.30(0.29)	0.98	5652.0	50500.00
5	26256.96	34.76	1.436	0.30(0.29)	0.98	7651.6	30600.00
6	29621.42	47.42	1.218	0.30(0.29)	0.97	12956.2	30110.00
7	30409.68	51.56	1.158	0.30(0.29)	0.97	14886.8	21400.00
8	31135.19	57.48	1.085	0.30(0.29)	0.97	17744.5	31400.00
9	32554.22	68.53	1.005	0.30(0.29)	0.96	22936.5	13100.00
10	33578.89	75.13	0.967	0.30(0.29)	0.96	25632.5	11801.00
11	35474.29	85.73	0.907	0.30(0.29)	0.97	30666.7	11530.00
12	37004.39	97.45	0.855	0.30(0.29)	0.97	37772.3	13010.00
13	38160.32	104.22	0.830	0.30(0.29)	0.97	42089.5	11350.00
14	38596.88	108.91	0.813	0.30(0.29)	0.97	45262.6	11130.00
15	38250.65	114.98	0.791	0.30(0.29)	0.97	48189.8	12300.00
16	38022.34	118.89	0.776	0.30(0.29)	0.98	50251.8	11620.00
17	37541.10	123.76	0.764	0.30(0.29)	0.98	52450.4	12400.00
18	36543.23	133.29	0.743	0.30(0.29)	0.98	55851.8	12201.00
19	35616.30	140.77	0.727	0.30(0.29)	0.98	57744.4	12231.00
20	34652.00	148.26	0.711	0.30(0.29)	0.98	59298.4	10400.00
21	33146.73	157.70	0.691	0.30(0.29)	0.98	60743.7	12010.00
22	32142.93	163.10	0.679	0.30(0.29)	0.98	61007.3	10210.00
23	31509.12	167.10	0.671	0.30(0.29)	0.98	61152.4	12000.00
24	27895.17	193.56	0.630	0.30(0.29)	0.98	61766.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 38596.88 Tc(MIN.) = 108.91
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 45262.64

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S36.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2618.30	20.77	0.30(0.30)	0.99	1238.4	21000.00
2	2660.65	23.52	0.30(0.30)	0.99	1422.7	20810.00
3	2670.43	23.85	0.30(0.30)	0.99	1448.7	20900.00
4	2725.68	26.50	0.30(0.30)	0.99	1639.8	20800.00
5	2731.26	28.41	0.30(0.30)	0.99	1764.4	20700.00
6	2739.71	36.15	0.30(0.30)	0.99	2271.7	20600.00
7	2698.22	41.95	0.30(0.30)	0.99	2609.8	20500.00
8	2659.27	44.36	0.30(0.30)	0.99	2711.1	20400.00
9	2654.12	44.80	0.30(0.30)	0.99	2724.6	20300.00
10	2613.77	47.49	0.30(0.30)	0.99	2803.3	20210.00
11	2613.33	47.55	0.30(0.30)	0.99	2805.7	20200.00
12	2588.88	49.31	0.30(0.30)	0.99	2861.8	20100.00
13	2520.36	54.05	0.30(0.30)	0.99	3006.2	13600.00
14	2220.63	91.25	0.30(0.29)	0.98	4001.9	13510.00
15	2080.51	100.74	0.30(0.29)	0.97	4067.7	13500.00

TOTAL AREA(ACRES) = 4067.7

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FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21976.16	17.79	2.178	0.30(0.29)	0.98	3327.7	21100.00
2	23106.00	21.75	1.907	0.30(0.29)	0.98	4316.2	50700.00
3	23747.97	24.13	1.786	0.30(0.29)	0.98	4880.9	50600.00
4	24388.84	27.08	1.654	0.30(0.29)	0.98	5652.0	50500.00
5	26256.96	34.76	1.436	0.30(0.29)	0.98	7651.6	30600.00
6	29621.42	47.42	1.218	0.30(0.29)	0.97	12956.2	30110.00
7	30409.68	51.56	1.158	0.30(0.29)	0.97	14886.8	21400.00
8	31135.19	57.48	1.085	0.30(0.29)	0.97	17744.5	31400.00
9	32554.22	68.53	1.005	0.30(0.29)	0.96	22936.5	13100.00
10	33578.89	75.13	0.967	0.30(0.29)	0.96	25632.5	11801.00
11	35474.29	85.73	0.907	0.30(0.29)	0.97	30666.7	11530.00
12	37004.39	97.45	0.855	0.30(0.29)	0.97	37772.3	13010.00
13	38160.32	104.22	0.830	0.30(0.29)	0.97	42089.5	11350.00
14	38596.88	108.91	0.813	0.30(0.29)	0.97	45262.6	11130.00
15	38250.65	114.98	0.791	0.30(0.29)	0.97	48189.8	12300.00
16	38022.34	118.89	0.776	0.30(0.29)	0.98	50251.8	11620.00
17	37541.10	123.76	0.764	0.30(0.29)	0.98	52450.4	12400.00
18	36543.23	133.29	0.743	0.30(0.29)	0.98	55851.8	12201.00
19	35616.30	140.77	0.727	0.30(0.29)	0.98	57744.4	12231.00
20	34652.00	148.26	0.711	0.30(0.29)	0.98	59298.4	10400.00
21	33146.73	157.70	0.691	0.30(0.29)	0.98	60743.7	12010.00
22	32142.93	163.10	0.679	0.30(0.29)	0.98	61007.3	10210.00
23	31509.12	167.10	0.671	0.30(0.29)	0.98	61152.4	12000.00
24	27895.17	193.56	0.630	0.30(0.29)	0.98	61766.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2618.30	20.77	1.957	0.30(0.30)	0.99	1238.4	21000.00
2	2660.65	23.52	1.817	0.30(0.30)	0.99	1422.7	20810.00

3	2670.43	23.85	1.800	0.30(0.30)	0.99	1448.7	20900.00
4	2725.68	26.50	1.679	0.30(0.30)	0.99	1639.8	20800.00
5	2731.26	28.41	1.598	0.30(0.30)	0.99	1764.4	20700.00
6	2739.71	36.15	1.408	0.30(0.30)	0.99	2271.7	20600.00
7	2698.22	41.95	1.301	0.30(0.30)	0.99	2609.8	20500.00
8	2659.27	44.36	1.264	0.30(0.30)	0.99	2711.1	20400.00
9	2654.12	44.80	1.258	0.30(0.30)	0.99	2724.6	20300.00
10	2613.77	47.49	1.216	0.30(0.30)	0.99	2803.3	20210.00
11	2613.33	47.55	1.215	0.30(0.30)	0.99	2805.7	20200.00
12	2588.88	49.31	1.189	0.30(0.30)	0.99	2861.8	20100.00
13	2520.36	54.05	1.127	0.30(0.30)	0.99	3006.2	13600.00
14	2220.63	91.25	0.878	0.30(0.29)	0.98	4001.9	13510.00
15	2080.51	100.74	0.843	0.30(0.29)	0.97	4067.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24518.31	17.79	2.178	0.30(0.29)	0.98	4388.7	21100.00
2	25443.70	20.77	1.957	0.30(0.29)	0.98	5309.1	21000.00
3	25739.43	21.75	1.907	0.30(0.29)	0.98	5620.5	50700.00
4	26244.65	23.52	1.817	0.30(0.29)	0.98	6159.3	20810.00
5	26344.39	23.85	1.800	0.30(0.29)	0.98	6264.5	20900.00
6	26424.12	24.13	1.786	0.30(0.29)	0.98	6349.4	50600.00
7	26987.45	26.50	1.679	0.30(0.29)	0.98	7138.9	20800.00
8	27116.23	27.08	1.654	0.30(0.29)	0.98	7330.1	50500.00
9	27441.81	28.41	1.598	0.30(0.29)	0.98	7760.7	20700.00
10	28995.16	34.76	1.436	0.30(0.29)	0.98	9832.7	30600.00
11	29364.55	36.15	1.408	0.30(0.29)	0.98	10503.4	20600.00
12	30865.78	41.95	1.301	0.30(0.29)	0.98	13273.7	20500.00
13	31466.77	44.36	1.264	0.30(0.29)	0.97	14384.0	20400.00
14	31579.39	44.80	1.258	0.30(0.29)	0.97	14583.2	20300.00
15	32236.23	47.42	1.218	0.30(0.29)	0.97	15757.4	30110.00
16	32248.35	47.49	1.216	0.30(0.29)	0.97	15791.7	20210.00
17	32260.11	47.55	1.215	0.30(0.29)	0.97	15824.0	20200.00
18	32570.39	49.31	1.189	0.30(0.29)	0.97	16699.9	20100.00
19	32966.03	51.56	1.158	0.30(0.29)	0.97	17817.2	21400.00
20	33235.38	54.05	1.127	0.30(0.29)	0.97	19095.7	13600.00
21	33627.95	57.48	1.085	0.30(0.29)	0.97	20842.5	31400.00
22	34957.93	68.53	1.005	0.30(0.29)	0.97	26330.2	13100.00
23	35929.44	75.13	0.967	0.30(0.29)	0.97	29202.9	11801.00
24	37739.42	85.73	0.907	0.30(0.29)	0.97	34520.8	11530.00
25	38415.58	91.25	0.878	0.30(0.29)	0.97	38015.2	13510.00
26	39133.42	97.45	0.855	0.30(0.29)	0.97	41817.2	13010.00
27	39646.52	100.74	0.843	0.30(0.29)	0.97	43937.6	13500.00
28	40192.25	104.22	0.830	0.30(0.29)	0.97	46157.3	11350.00
29	40563.30	108.91	0.813	0.30(0.29)	0.97	49330.4	11130.00
30	40132.17	114.98	0.791	0.30(0.29)	0.97	52257.5	12300.00
31	39849.37	118.89	0.776	0.30(0.29)	0.98	54319.6	11620.00
32	39322.02	123.76	0.764	0.30(0.29)	0.98	56518.1	12400.00
33	38246.86	133.29	0.743	0.30(0.29)	0.98	59919.6	12201.00
34	37259.17	140.77	0.727	0.30(0.29)	0.98	61812.1	12231.00
35	36234.05	148.26	0.711	0.30(0.29)	0.98	63366.2	10400.00
36	34652.16	157.70	0.691	0.30(0.29)	0.98	64811.4	12010.00
37	33604.54	163.10	0.679	0.30(0.29)	0.98	65075.0	10210.00
38	32938.27	167.10	0.671	0.30(0.29)	0.98	65220.1	12000.00
39	29171.28	193.56	0.630	0.30(0.29)	0.98	65834.6	10100.00

TOTAL AREA(ACRES) = 65834.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 40563.30 Tc(MIN.) = 108.907
EFFECTIVE AREA(ACRES) = 49330.38 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 65834.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

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FLOW PROCESS FROM NODE 13410.00 TO NODE 13412.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 178.72 DOWNSTREAM(FEET) = 176.93
CHANNEL LENGTH THRU SUBAREA(FEET) = 169.78 CHANNEL SLOPE = 0.0105
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.69
CHANNEL FLOW THRU SUBAREA(CFS) = 40563.30
FLOW VELOCITY(FEET/SEC.) = 19.19 FLOW DEPTH(FEET) = 8.69
TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 109.05
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24518.31	17.97	2.164	0.30(0.29)	0.98	4388.7	21100.00
2	25443.70	20.94	1.948	0.30(0.29)	0.98	5309.1	21000.00
3	25739.43	21.92	1.898	0.30(0.29)	0.98	5620.5	50700.00
4	26244.65	23.69	1.808	0.30(0.29)	0.98	6159.3	20810.00
5	26344.39	24.02	1.792	0.30(0.29)	0.98	6264.5	20900.00
6	26424.12	24.30	1.778	0.30(0.29)	0.98	6349.4	50600.00
7	26987.45	26.67	1.672	0.30(0.29)	0.98	7138.9	20800.00
8	27116.23	27.25	1.647	0.30(0.29)	0.98	7330.1	50500.00
9	27441.81	28.57	1.591	0.30(0.29)	0.98	7760.7	20700.00
10	28995.16	34.93	1.432	0.30(0.29)	0.98	9832.7	30600.00
11	29364.55	36.31	1.405	0.30(0.29)	0.98	10503.4	20600.00
12	30865.78	42.11	1.299	0.30(0.29)	0.98	13273.7	20500.00
13	31466.77	44.52	1.262	0.30(0.29)	0.97	14384.0	20400.00
14	31579.39	44.96	1.255	0.30(0.29)	0.97	14583.2	20300.00
15	32236.23	47.58	1.215	0.30(0.29)	0.97	15757.4	30110.00
16	32248.35	47.64	1.214	0.30(0.29)	0.97	15791.7	20210.00
17	32260.11	47.71	1.213	0.30(0.29)	0.97	15824.0	20200.00
18	32570.39	49.47	1.186	0.30(0.29)	0.97	16699.9	20100.00
19	32966.03	51.72	1.157	0.30(0.29)	0.97	17817.2	21400.00
20	33235.38	54.21	1.125	0.30(0.29)	0.97	19095.7	13600.00
21	33627.95	57.63	1.083	0.30(0.29)	0.97	20842.5	31400.00
22	34957.93	68.68	1.004	0.30(0.29)	0.97	26330.2	13100.00
23	35929.44	75.28	0.966	0.30(0.29)	0.97	29202.9	11801.00
24	37739.42	85.88	0.906	0.30(0.29)	0.97	34520.8	11530.00
25	38415.58	91.40	0.878	0.30(0.29)	0.97	38015.2	13510.00
26	39133.42	97.60	0.855	0.30(0.29)	0.97	41817.2	13010.00
27	39646.52	100.89	0.843	0.30(0.29)	0.97	43937.6	13500.00
28	40192.25	104.36	0.830	0.30(0.29)	0.97	46157.3	11350.00
29	40563.30	109.05	0.812	0.30(0.29)	0.97	49330.4	11130.00
30	40132.17	115.13	0.790	0.30(0.29)	0.97	52257.5	12300.00
31	39849.37	119.03	0.776	0.30(0.29)	0.98	54319.6	11620.00

32	39322.02	123.91	0.764	0.30(0.29)	0.98	56518.1	12400.00
33	38246.86	133.44	0.743	0.30(0.29)	0.98	59919.6	12201.00
34	37259.17	140.92	0.727	0.30(0.29)	0.98	61812.1	12231.00
35	36234.05	148.42	0.711	0.30(0.29)	0.98	63366.2	10400.00
36	34652.16	157.86	0.691	0.30(0.29)	0.98	64811.4	12010.00
37	33604.54	163.26	0.679	0.30(0.29)	0.98	65075.0	10210.00
38	32938.27	167.26	0.670	0.30(0.29)	0.98	65220.1	12000.00
39	29171.28	193.72	0.630	0.30(0.29)	0.98	65834.6	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 40563.30 Tc(MIN.) = 109.05
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 49330.38

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
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****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
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PEAK FLOWRATE TABLE FILE NAME: 0509101W.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	572.78	37.22	0.30(0.30)	1.00	585.7	10100.00

TOTAL AREA(ACRES) = 585.7

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24518.31	17.97	2.164	0.30(0.29)	0.98	4388.7	21100.00
2	25443.70	20.94	1.948	0.30(0.29)	0.98	5309.1	21000.00
3	25739.43	21.92	1.898	0.30(0.29)	0.98	5620.5	50700.00
4	26244.65	23.69	1.808	0.30(0.29)	0.98	6159.3	20810.00
5	26344.39	24.02	1.792	0.30(0.29)	0.98	6264.5	20900.00
6	26424.12	24.30	1.778	0.30(0.29)	0.98	6349.4	50600.00
7	26987.45	26.67	1.672	0.30(0.29)	0.98	7138.9	20800.00
8	27116.23	27.25	1.647	0.30(0.29)	0.98	7330.1	50500.00
9	27441.81	28.57	1.591	0.30(0.29)	0.98	7760.7	20700.00
10	28995.16	34.93	1.432	0.30(0.29)	0.98	9832.7	30600.00
11	29364.55	36.31	1.405	0.30(0.29)	0.98	10503.4	20600.00
12	30865.78	42.11	1.299	0.30(0.29)	0.98	13273.7	20500.00
13	31466.77	44.52	1.262	0.30(0.29)	0.97	14384.0	20400.00
14	31579.39	44.96	1.255	0.30(0.29)	0.97	14583.2	20300.00
15	32236.23	47.58	1.215	0.30(0.29)	0.97	15757.4	30110.00
16	32248.35	47.64	1.214	0.30(0.29)	0.97	15791.7	20210.00
17	32260.11	47.71	1.213	0.30(0.29)	0.97	15824.0	20200.00
18	32570.39	49.47	1.186	0.30(0.29)	0.97	16699.9	20100.00

19	32966.03	51.72	1.157	0.30(0.29)	0.97	17817.2	21400.00
20	33235.38	54.21	1.125	0.30(0.29)	0.97	19095.7	13600.00
21	33627.95	57.63	1.083	0.30(0.29)	0.97	20842.5	31400.00
22	34957.93	68.68	1.004	0.30(0.29)	0.97	26330.2	13100.00
23	35929.44	75.28	0.966	0.30(0.29)	0.97	29202.9	11801.00
24	37739.42	85.88	0.906	0.30(0.29)	0.97	34520.8	11530.00
25	38415.58	91.40	0.878	0.30(0.29)	0.97	38015.2	13510.00
26	39133.42	97.60	0.855	0.30(0.29)	0.97	41817.2	13010.00
27	39646.52	100.89	0.843	0.30(0.29)	0.97	43937.6	13500.00
28	40192.25	104.36	0.830	0.30(0.29)	0.97	46157.3	11350.00
29	40563.30	109.05	0.812	0.30(0.29)	0.97	49330.4	11130.00
30	40132.17	115.13	0.790	0.30(0.29)	0.97	52257.5	12300.00
31	39849.37	119.03	0.776	0.30(0.29)	0.98	54319.6	11620.00
32	39322.02	123.91	0.764	0.30(0.29)	0.98	56518.1	12400.00
33	38246.86	133.44	0.743	0.30(0.29)	0.98	59919.6	12201.00
34	37259.17	140.92	0.727	0.30(0.29)	0.98	61812.1	12231.00
35	36234.05	148.42	0.711	0.30(0.29)	0.98	63366.2	10400.00
36	34652.16	157.86	0.691	0.30(0.29)	0.98	64811.4	12010.00
37	33604.54	163.26	0.679	0.30(0.29)	0.98	65075.0	10210.00
38	32938.27	167.26	0.670	0.30(0.29)	0.98	65220.1	12000.00
39	29171.28	193.72	0.630	0.30(0.29)	0.98	65834.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	572.78	37.22	1.387	0.30(0.30)	1.00	585.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 14724.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24992.58	17.97	2.164	0.30(0.29)	0.98	4671.4	21100.00
2	25932.49	20.94	1.948	0.30(0.29)	0.98	5638.7	21000.00
3	26235.66	21.92	1.898	0.30(0.29)	0.98	5965.5	50700.00
4	26750.76	23.69	1.808	0.30(0.29)	0.98	6532.1	20810.00
5	26851.86	24.02	1.792	0.30(0.29)	0.98	6642.5	20900.00
6	26932.59	24.30	1.778	0.30(0.29)	0.98	6731.7	50600.00
7	27505.46	26.67	1.672	0.30(0.29)	0.98	7558.5	20800.00
8	27636.08	27.25	1.647	0.30(0.29)	0.98	7758.9	50500.00
9	27964.30	28.57	1.591	0.30(0.29)	0.98	8210.4	20700.00
10	29555.33	34.93	1.432	0.30(0.29)	0.98	10382.3	30600.00
11	29932.68	36.31	1.405	0.30(0.29)	0.98	11074.7	20600.00
12	30173.62	37.22	1.387	0.30(0.29)	0.98	11525.1	10100.00
13	31392.28	42.11	1.299	0.30(0.29)	0.98	13859.4	20500.00
14	31973.87	44.52	1.262	0.30(0.29)	0.98	14969.8	20400.00
15	32082.92	44.96	1.255	0.30(0.29)	0.98	15168.9	20300.00
16	32718.65	47.58	1.215	0.30(0.29)	0.97	16343.1	30110.00
17	32730.21	47.64	1.214	0.30(0.29)	0.97	16377.4	20210.00
18	32741.46	47.71	1.213	0.30(0.29)	0.97	16409.7	20200.00
19	33037.55	49.47	1.186	0.30(0.29)	0.97	17285.6	20100.00
20	33417.58	51.72	1.157	0.30(0.29)	0.97	18402.9	21400.00
21	33670.52	54.21	1.125	0.30(0.29)	0.97	19681.4	13600.00
22	34040.53	57.63	1.083	0.30(0.29)	0.97	21428.2	31400.00
23	35328.97	68.68	1.004	0.30(0.29)	0.97	26915.9	13100.00
24	36280.77	75.28	0.966	0.30(0.29)	0.97	29788.6	11801.00
25	38059.09	85.88	0.906	0.30(0.29)	0.97	35106.5	11530.00
26	38720.21	91.40	0.878	0.30(0.29)	0.97	38601.0	13510.00

```
    27    39425.96   97.60    0.855  0.30( 0.29) 0.97   42402.9   13010.00
    28    39932.65  100.89    0.843  0.30( 0.29) 0.97   44523.3   13500.00
    29    40471.59  104.36    0.830  0.30( 0.29) 0.97   46743.0   11350.00
    30    40833.50  109.05    0.812  0.30( 0.29) 0.97   49916.1   11130.00
    31    40390.51  115.13    0.790  0.30( 0.29) 0.97   52843.3   12300.00
    32    40100.10  119.03    0.776  0.30( 0.29) 0.98   54905.3   11620.00
    33    39566.44  123.91    0.764  0.30( 0.29) 0.98   57103.8   12400.00
    34    38480.48  133.44    0.743  0.30( 0.29) 0.98   60505.3   12201.00
    35    37484.30  140.92    0.727  0.30( 0.29) 0.98   62397.9   12231.00
    36    36450.69  148.42    0.711  0.30( 0.29) 0.98   63951.9   10400.00
    37    34858.10  157.86    0.691  0.30( 0.29) 0.98   65397.1   12010.00
    38    33804.36  163.26    0.679  0.30( 0.29) 0.98   65660.7   10210.00
    39    33133.55  167.26    0.670  0.30( 0.29) 0.98   65805.9   12000.00
    40    29345.29  193.72    0.630  0.30( 0.29) 0.98   66420.4   10100.00
  TOTAL AREA(ACRES) =     66420.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    40833.50  Tc(MIN.) =  109.054
 EFFECTIVE AREA(ACRES) =  49916.11  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    66420.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13412.00 =  124291.87 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13412.00 TO NODE  13700.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    176.93  DOWNSTREAM(FEET) =    173.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   260.10   CHANNEL SLOPE =  0.0151
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.87
 CHANNEL FLOW THRU SUBAREA(CFS) =   40833.50
 FLOW VELOCITY(FEET/SEC.) =  21.68   FLOW DEPTH(FEET) =   7.87
 TRAVEL TIME(MIN.) =   0.20   Tc(MIN.) =  109.25
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13700.00 =  124551.97 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    24992.58   18.20    2.144  0.30( 0.29) 0.98    4671.4   21100.00
     2    25932.49   21.17    1.936  0.30( 0.29) 0.98    5638.7   21000.00
     3    26235.66   22.16    1.886  0.30( 0.29) 0.98    5965.5   50700.00
     4    26750.76   23.92    1.797  0.30( 0.29) 0.98    6532.1   20810.00
     5    26851.86   24.25    1.780  0.30( 0.29) 0.98    6642.5   20900.00
     6    26932.59   24.53    1.766  0.30( 0.29) 0.98    6731.7   50600.00
     7    27505.46   26.90    1.662  0.30( 0.29) 0.98    7558.5   20800.00
     8    27636.08   27.48    1.637  0.30( 0.29) 0.98    7758.9   50500.00
     9    27964.30   28.80    1.582  0.30( 0.29) 0.98    8210.4   20700.00
    10    29555.33   35.15    1.428  0.30( 0.29) 0.98   10382.3   30600.00
    11    29932.68   36.53    1.400  0.30( 0.29) 0.98   11074.7   20600.00
    12    30173.62   37.45    1.382  0.30( 0.29) 0.98   11525.1   10100.00
    13    31392.28   42.33    1.295  0.30( 0.29) 0.98   13859.4   20500.00
    14    31973.87   44.73    1.259  0.30( 0.29) 0.98   14969.8   20400.00
    15    32082.92   45.18    1.252  0.30( 0.29) 0.98   15168.9   20300.00
    16    32718.65   47.79    1.212  0.30( 0.29) 0.97   16343.1   30110.00
```



```
    17    32730.21   47.86    1.211  0.30( 0.29) 0.97   16377.4   20210.00
    18    32741.46   47.92    1.210  0.30( 0.29) 0.97   16409.7   20200.00
    19    33037.55   49.68    1.183  0.30( 0.29) 0.97   17285.6   20100.00
    20    33417.58   51.93    1.154  0.30( 0.29) 0.97   18402.9   21400.00
    21    33670.52   54.42    1.123  0.30( 0.29) 0.97   19681.4   13600.00
    22    34040.53   57.85    1.080  0.30( 0.29) 0.97   21428.2   31400.00
    23    35328.97   68.89    1.003  0.30( 0.29) 0.97   26915.9   13100.00
    24    36280.77   75.49    0.965  0.30( 0.29) 0.97   29788.6   11801.00
    25    38059.09   86.08    0.905  0.30( 0.29) 0.97   35106.5   11530.00
    26    38720.21   91.60    0.877  0.30( 0.29) 0.97   38601.0   13510.00
    27    39425.96   97.80    0.854  0.30( 0.29) 0.97   42402.9   13010.00
    28    39932.65  101.09    0.842  0.30( 0.29) 0.97   44523.3   13500.00
    29    40471.59  104.57    0.829  0.30( 0.29) 0.97   46743.0   11350.00
    30    40833.50  109.25    0.812  0.30( 0.29) 0.97   49916.1   11130.00
    31    40390.51  115.33    0.789  0.30( 0.29) 0.97   52843.3   12300.00
    32    40100.10  119.23    0.775  0.30( 0.29) 0.98   54905.3   11620.00
    33    39566.44  124.11    0.763  0.30( 0.29) 0.98   57103.8   12400.00
    34    38480.48  133.64    0.743  0.30( 0.29) 0.98   60505.3   12201.00
    35    37484.30  141.13    0.727  0.30( 0.29) 0.98   62397.9   12231.00
    36    36450.69  148.62    0.710  0.30( 0.29) 0.98   63951.9   10400.00
    37    34858.10  158.07    0.690  0.30( 0.29) 0.98   65397.1   12010.00
    38    33804.36  163.47    0.679  0.30( 0.29) 0.98   65660.7   10210.00
    39    33133.55  167.47    0.670  0.30( 0.29) 0.98   65805.9   12000.00
    40    29345.29  193.95    0.630  0.30( 0.29) 0.98   66420.4   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =   40833.50  Tc(MIN.) =  109.25
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   49916.11

****************************************************************************
 FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610508W.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      194.47   21.06  0.30( 0.30) 0.99     131.3   50800.00
  TOTAL AREA(ACRES) =      131.3

****************************************************************************
 FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    24992.58   18.20    2.144  0.30( 0.29) 0.98    4671.4   21100.00
     2    25932.49   21.17    1.936  0.30( 0.29) 0.98    5638.7   21000.00
```

```
    3    26235.66   22.16    1.886  0.30( 0.29) 0.98    5965.5   50700.00
    4    26750.76   23.92    1.797  0.30( 0.29) 0.98    6532.1   20810.00
    5    26851.86   24.25    1.780  0.30( 0.29) 0.98    6642.5   20900.00
    6    26932.59   24.53    1.766  0.30( 0.29) 0.98    6731.7   50600.00
    7    27505.46   26.90    1.662  0.30( 0.29) 0.98    7558.5   20800.00
    8    27636.08   27.48    1.637  0.30( 0.29) 0.98    7758.9   50500.00
    9    27964.30   28.80    1.582  0.30( 0.29) 0.98    8210.4   20700.00
   10    29555.33   35.15    1.428  0.30( 0.29) 0.98   10382.3   30600.00
   11    29932.68   36.53    1.400  0.30( 0.29) 0.98   11074.7   20600.00
   12    30173.62   37.45    1.382  0.30( 0.29) 0.98   11525.1   10100.00
   13    31392.28   42.33    1.295  0.30( 0.29) 0.98   13859.4   20500.00
   14    31973.87   44.73    1.259  0.30( 0.29) 0.98   14969.8   20400.00
   15    32082.92   45.18    1.252  0.30( 0.29) 0.98   15168.9   20300.00
   16    32718.65   47.79    1.212  0.30( 0.29) 0.97   16343.1   30110.00
   17    32730.21   47.86    1.211  0.30( 0.29) 0.97   16377.4   20210.00
   18    32741.46   47.92    1.210  0.30( 0.29) 0.97   16409.7   20200.00
   19    33037.55   49.68    1.183  0.30( 0.29) 0.97   17285.6   20100.00
   20    33417.58   51.93    1.154  0.30( 0.29) 0.97   18402.9   21400.00
   21    33670.52   54.42    1.123  0.30( 0.29) 0.97   19681.4   13600.00
   22    34040.53   57.85    1.080  0.30( 0.29) 0.97   21428.2   31400.00
   23    35328.97   68.89    1.003  0.30( 0.29) 0.97   26915.9   13100.00
   24    36280.77   75.49    0.965  0.30( 0.29) 0.97   29788.6   11801.00
   25    38059.09   86.08    0.905  0.30( 0.29) 0.97   35106.5   11530.00
   26    38720.21   91.60    0.877  0.30( 0.29) 0.97   38601.0   13510.00
   27    39425.96   97.80    0.854  0.30( 0.29) 0.97   42402.9   13010.00
   28    39932.65  101.09    0.842  0.30( 0.29) 0.97   44523.3   13500.00
   29    40471.59  104.57    0.829  0.30( 0.29) 0.97   46743.0   11350.00
   30    40833.50  109.25    0.812  0.30( 0.29) 0.97   49916.1   11130.00
   31    40390.51  115.33    0.789  0.30( 0.29) 0.97   52843.3   12300.00
   32    40100.10  119.23    0.775  0.30( 0.29) 0.98   54905.3   11620.00
   33    39566.44  124.11    0.763  0.30( 0.29) 0.98   57103.8   12400.00
   34    38480.48  133.64    0.743  0.30( 0.29) 0.98   60505.3   12201.00
   35    37484.30  141.13    0.727  0.30( 0.29) 0.98   62397.9   12231.00
   36    36450.69  148.62    0.710  0.30( 0.29) 0.98   63951.9   10400.00
   37    34858.10  158.07    0.690  0.30( 0.29) 0.98   65397.1   12010.00
   38    33804.36  163.47    0.679  0.30( 0.29) 0.98   65660.7   10210.00
   39    33133.55  167.47    0.670  0.30( 0.29) 0.98   65805.9   12000.00
   40    29345.29  193.95    0.630  0.30( 0.29) 0.98   66420.4   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13700.00 =  124551.97 FEET.

** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      194.47   21.06    1.942  0.30( 0.30) 0.99     131.3   50800.00
LONGEST FLOWPATH FROM NODE  50800.00 TO NODE  13700.00 =    5946.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    25181.34   18.20    2.144  0.30( 0.29) 0.98    4784.9   21100.00
    2    26089.55   21.06    1.942  0.30( 0.29) 0.98    5731.4   50800.00
    3    26126.25   21.17    1.936  0.30( 0.29) 0.98    5769.9   21000.00
    4    26423.53   22.16    1.886  0.30( 0.29) 0.98    6096.7   50700.00
    5    26928.03   23.92    1.797  0.30( 0.29) 0.98    6663.4   20810.00
    6    27027.13   24.25    1.780  0.30( 0.29) 0.98    6773.7   20900.00
    7    27106.22   24.53    1.766  0.30( 0.29) 0.98    6862.9   50600.00
    8    27666.81   26.90    1.662  0.30( 0.29) 0.98    7689.8   20800.00
    9    27794.51   27.48    1.637  0.30( 0.29) 0.98    7890.1   50500.00
```



```
   10    28116.14   28.80    1.582  0.30( 0.29) 0.98    8341.6   20700.00
   11    29689.02   35.15    1.428  0.30( 0.29) 0.98   10513.5   30600.00
   12    30063.10   36.53    1.400  0.30( 0.29) 0.98   11206.0   20600.00
   13    30301.89   37.45    1.382  0.30( 0.29) 0.98   11656.4   10100.00
   14    31510.31   42.33    1.295  0.30( 0.29) 0.98   13990.7   20500.00
   15    32087.55   44.73    1.259  0.30( 0.29) 0.98   15101.0   20400.00
   16    32195.80   45.18    1.252  0.30( 0.29) 0.98   15300.2   20300.00
   17    32826.80   47.79    1.212  0.30( 0.29) 0.97   16474.4   30110.00
   18    32838.24   47.86    1.211  0.30( 0.29) 0.97   16508.6   20210.00
   19    32849.37   47.92    1.210  0.30( 0.29) 0.97   16541.0   20200.00
   20    33142.28   49.68    1.183  0.30( 0.29) 0.97   17416.9   20100.00
   21    33518.88   51.93    1.154  0.30( 0.29) 0.97   18534.2   21400.00
   22    33768.15   54.42    1.123  0.30( 0.29) 0.97   19812.7   13600.00
   23    34133.10   57.85    1.080  0.30( 0.29) 0.97   21559.5   31400.00
   24    35412.41   68.89    1.003  0.30( 0.29) 0.97   27047.2   13100.00
   25    36359.79   75.49    0.965  0.30( 0.29) 0.97   29919.9   11801.00
   26    38131.02   86.08    0.905  0.30( 0.29) 0.97   35237.8   11530.00
   27    38788.81   91.60    0.877  0.30( 0.29) 0.97   38732.2   13510.00
   28    39491.85   97.80    0.854  0.30( 0.29) 0.97   42534.2   13010.00
   29    39997.10  101.09    0.842  0.30( 0.29) 0.97   44654.6   13500.00
   30    40534.53  104.57    0.829  0.30( 0.29) 0.97   46874.3   11350.00
   31    40894.39  109.25    0.812  0.30( 0.29) 0.97   50047.4   11130.00
   32    40448.74  115.33    0.789  0.30( 0.29) 0.98   52974.5   12300.00
   33    40156.62  119.23    0.775  0.30( 0.29) 0.98   55036.6   11620.00
   34    39621.58  124.11    0.763  0.30( 0.29) 0.98   57235.1   12400.00
   35    38533.20  133.64    0.743  0.30( 0.29) 0.98   60636.6   12201.00
   36    37535.12  141.13    0.727  0.30( 0.29) 0.98   62529.1   12231.00
   37    36499.61  148.62    0.710  0.30( 0.29) 0.98   64083.2   10400.00
   38    34904.61  158.07    0.690  0.30( 0.29) 0.98   65528.4   12010.00
   39    33849.50  163.47    0.679  0.30( 0.29) 0.98   65792.0   10210.00
   40    33177.68  167.47    0.670  0.30( 0.29) 0.98   65937.1   12000.00
   41    29384.68  193.95    0.630  0.30( 0.29) 0.98   66551.6   10100.00
  TOTAL AREA(ACRES) =     66551.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    40894.39  Tc(MIN.) =  109.254
 EFFECTIVE AREA(ACRES) =  50047.37  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    66551.6
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13700.00 =  124551.97 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =    66551.6  TC(MIN.) =    109.25
 EFFECTIVE AREA(ACRES) =  50047.37  AREA-AVERAGED Fm(INCH/HR)=  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.974
 PEAK FLOW RATE(CFS)   =   40894.39

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    25181.34   18.20    2.144  0.30( 0.29) 0.98    4784.9   21100.00
     2    26089.55   21.06    1.942  0.30( 0.29) 0.98    5731.4   50800.00
     3    26126.25   21.17    1.936  0.30( 0.29) 0.98    5769.9   21000.00
     4    26423.53   22.16    1.886  0.30( 0.29) 0.98    6096.7   50700.00
     5    26928.03   23.92    1.797  0.30( 0.29) 0.98    6663.4   20810.00
     6    27027.13   24.25    1.780  0.30( 0.29) 0.98    6773.7   20900.00
     7    27106.22   24.53    1.766  0.30( 0.29) 0.98    6862.9   50600.00
     8    27666.81   26.90    1.662  0.30( 0.29) 0.98    7689.8   20800.00
```

9	27794.51	27.48	1.637	0.30(0.29)	0.98	7890.1	50500.00
10	28116.14	28.80	1.582	0.30(0.29)	0.98	8341.6	20700.00
11	29689.02	35.15	1.428	0.30(0.29)	0.98	10513.5	30600.00
12	30063.10	36.53	1.400	0.30(0.29)	0.98	11206.0	20600.00
13	30301.89	37.45	1.382	0.30(0.29)	0.98	11656.4	10100.00
14	31510.31	42.33	1.295	0.30(0.29)	0.98	13990.7	20500.00
15	32087.55	44.73	1.259	0.30(0.29)	0.98	15101.0	20400.00
16	32195.80	45.18	1.252	0.30(0.29)	0.98	15300.2	20300.00
17	32826.80	47.79	1.212	0.30(0.29)	0.97	16474.4	30110.00
18	32838.24	47.86	1.211	0.30(0.29)	0.97	16508.6	20210.00
19	32849.37	47.92	1.210	0.30(0.29)	0.97	16541.0	20200.00
20	33142.28	49.68	1.183	0.30(0.29)	0.97	17416.9	20100.00
21	33518.88	51.93	1.154	0.30(0.29)	0.97	18534.2	21400.00
22	33768.15	54.42	1.123	0.30(0.29)	0.97	19812.7	13600.00
23	34133.10	57.85	1.080	0.30(0.29)	0.97	21559.5	31400.00
24	35412.41	68.89	1.003	0.30(0.29)	0.97	27047.2	13100.00
25	36359.79	75.49	0.965	0.30(0.29)	0.97	29919.9	11801.00
26	38131.02	86.08	0.905	0.30(0.29)	0.97	35237.8	11530.00
27	38788.81	91.60	0.877	0.30(0.29)	0.97	38732.2	13510.00
28	39491.85	97.80	0.854	0.30(0.29)	0.97	42534.2	13010.00
29	39997.10	101.09	0.842	0.30(0.29)	0.97	44654.6	13500.00
30	40534.53	104.57	0.829	0.30(0.29)	0.97	46874.3	11350.00
31	40894.39	109.25	0.812	0.30(0.29)	0.97	50047.4	11130.00
32	40448.74	115.33	0.789	0.30(0.29)	0.98	52974.5	12300.00
33	40156.62	119.23	0.775	0.30(0.29)	0.98	55036.6	11620.00
34	39621.58	124.11	0.763	0.30(0.29)	0.98	57235.1	12400.00
35	38533.20	133.64	0.743	0.30(0.29)	0.98	60636.6	12201.00
36	37535.12	141.13	0.727	0.30(0.29)	0.98	62529.1	12231.00
37	36499.61	148.62	0.710	0.30(0.29)	0.98	64083.2	10400.00
38	34904.61	158.07	0.690	0.30(0.29)	0.98	65528.4	12010.00
39	33849.50	163.47	0.679	0.30(0.29)	0.98	65792.0	10210.00
40	33177.68	167.47	0.670	0.30(0.29)	0.98	65937.1	12000.00
41	29384.68	193.95	0.630	0.30(0.29)	0.98	66551.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S35.DAT
  TIME/DATE OF STUDY: 13:31 04/03/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.080
   2)   10.00;  2.729
   3)   15.00;  2.163
   4)   20.00;  1.834
   5)   25.00;  1.614
   6)   30.00;  1.440
   7)   40.00;  1.233
   8)   50.00;  1.085
   9)   60.00;  0.950
  10)   90.00;  0.775
  11)  120.00;  0.657
  12)  180.00;  0.530
  13)  360.00;  0.367
  14) 1440.00;  0.153
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13500.00 TO NODE  13500.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   548.43
  ELEVATION DATA: UPSTREAM(FEET) =   1183.47  DOWNSTREAM(FEET) =   1065.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.955
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.508
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        5.11      0.30     1.000     0   11.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.15
  TOTAL AREA(ACRES) =      5.11   PEAK FLOW RATE(CFS) =     10.15

****************************************************************************
  FLOW PROCESS FROM NODE  13500.50 TO NODE  13501.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1065.00  DOWNSTREAM(FEET) =   1033.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =   431.71   CHANNEL SLOPE =  0.0738
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.288
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.71
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   1.94
  Tc(MIN.) =   13.89
  SUBAREA AREA(ACRES) =     8.87       SUBAREA RUNOFF(CFS) =   15.87
  EFFECTIVE AREA(ACRES) =     13.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.0          PEAK FLOW RATE(CFS) =      25.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   4.14
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13501.00 =     980.14 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13501.00 TO NODE  13502.00 IS CODE =  56
```

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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1033.15  DOWNSTREAM(FEET) =    990.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.63   CHANNEL SLOPE =  0.0452
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.981
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.08
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   3.87
  Tc(MIN.) =   17.77
  SUBAREA AREA(ACRES) =    16.82       SUBAREA RUNOFF(CFS) =   25.45
  EFFECTIVE AREA(ACRES) =     30.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       30.8         PEAK FLOW RATE(CFS) =      46.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   4.37
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13502.00 =    1928.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13502.00 TO NODE  13503.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.26  DOWNSTREAM(FEET) =    956.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.98   CHANNEL SLOPE =  0.0363
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.788
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.80
  AVERAGE FLOW DEPTH(FEET) =   1.28   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   21.04
  SUBAREA AREA(ACRES) =    46.02       SUBAREA RUNOFF(CFS) =   61.65
  EFFECTIVE AREA(ACRES) =     76.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.8         PEAK FLOW RATE(CFS) =     102.91
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =   5.24
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13503.00 =    2869.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13503.00 TO NODE  13504.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    956.06  DOWNSTREAM(FEET) =    889.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2131.31   CHANNEL SLOPE =  0.0312
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.88
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.524
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     135.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.41
  AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   6.56
  Tc(MIN.) =   27.59
  SUBAREA AREA(ACRES) =    58.46       SUBAREA RUNOFF(CFS) =   64.39
  EFFECTIVE AREA(ACRES) =    135.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      135.3         PEAK FLOW RATE(CFS) =     149.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   5.58
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13504.00 =    5001.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13504.00 TO NODE  13505.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    889.48  DOWNSTREAM(FEET) =    848.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1661.97   CHANNEL SLOPE =  0.0249
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.383
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       49.30      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     173.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.38
  AVERAGE FLOW DEPTH(FEET) =   2.22   TRAVEL TIME(MIN.) =   5.15
  Tc(MIN.) =   32.74
  SUBAREA AREA(ACRES) =    49.30       SUBAREA RUNOFF(CFS) =   48.07
  EFFECTIVE AREA(ACRES) =    184.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      184.6         PEAK FLOW RATE(CFS) =     179.96
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.28   FLOW VELOCITY(FEET/SEC.) =   5.43
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.00 =    6663.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.00 TO NODE  13505.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    848.10  DOWNSTREAM(FEET) =    811.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1234.61   CHANNEL SLOPE =  0.0300
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.312
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.35      0.30     0.811     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.811
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     198.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.98
  AVERAGE FLOW DEPTH(FEET) =   2.28   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   36.18
  SUBAREA AREA(ACRES) =    39.35       SUBAREA RUNOFF(CFS) =   37.85
  EFFECTIVE AREA(ACRES) =    223.93     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      223.9         PEAK FLOW RATE(CFS) =     205.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.33   FLOW VELOCITY(FEET/SEC.) =   6.03
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.50 =    7897.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.50 TO NODE  13506.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    811.10  DOWNSTREAM(FEET) =    781.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1415.98   CHANNEL SLOPE =  0.0213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.226
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.33      0.30     0.738     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.738
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     230.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.51
  AVERAGE FLOW DEPTH(FEET) =   2.71   TRAVEL TIME(MIN.) =   4.28
  Tc(MIN.) =   40.46
  SUBAREA AREA(ACRES) =    54.33       SUBAREA RUNOFF(CFS) =   49.13
  EFFECTIVE AREA(ACRES) =    278.26     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =      278.3         PEAK FLOW RATE(CFS) =     237.80
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.76   FLOW VELOCITY(FEET/SEC.) =   5.56
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.00 =    9313.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13506.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    781.00  DOWNSTREAM(FEET) =    743.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1542.62   CHANNEL SLOPE =  0.0245
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.80
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.163
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.33      0.30     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     263.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.04
  AVERAGE FLOW DEPTH(FEET) =   2.80   TRAVEL TIME(MIN.) =   4.26
  Tc(MIN.) =   44.72
  SUBAREA AREA(ACRES) =    61.33       SUBAREA RUNOFF(CFS) =   51.24
  EFFECTIVE AREA(ACRES) =    339.59     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =      339.6         PEAK FLOW RATE(CFS) =     273.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.86
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.86   FLOW VELOCITY(FEET/SEC.) =   6.09
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.50 =   10856.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.50 TO NODE  13520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    743.17  DOWNSTREAM(FEET) =    717.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1370.93   CHANNEL SLOPE =  0.0191
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.14
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.103
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.86      0.30     0.848     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.848
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     288.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.65
  AVERAGE FLOW DEPTH(FEET) =   3.14   TRAVEL TIME(MIN.) =   4.05
  Tc(MIN.) =   48.77
  SUBAREA AREA(ACRES) =    39.86       SUBAREA RUNOFF(CFS) =   30.45
  EFFECTIVE AREA(ACRES) =    379.45     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =      379.5         PEAK FLOW RATE(CFS) =     285.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.12   FLOW VELOCITY(FEET/SEC.) =   5.64
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   48.77
  RAINFALL INTENSITY(INCH/HR) =   1.10
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     379.45
  TOTAL STREAM AREA(ACRES) =     379.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     285.41

****************************************************************************
  FLOW PROCESS FROM NODE  13510.00 TO NODE  13511.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```



```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   903.68
  ELEVATION DATA: UPSTREAM(FEET) =   1216.90  DOWNSTREAM(FEET) =   1022.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.615
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.207
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.30     1.000     0   14.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.43
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =     11.43

****************************************************************************
  FLOW PROCESS FROM NODE  13511.00 TO NODE  13512.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1022.78  DOWNSTREAM(FEET) =    954.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1027.63   CHANNEL SLOPE =  0.0667
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.66
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.926
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       25.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.30
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   3.98
  Tc(MIN.) =   18.60
  SUBAREA AREA(ACRES) =    25.40       SUBAREA RUNOFF(CFS) =   37.18
  EFFECTIVE AREA(ACRES) =     32.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       32.1         PEAK FLOW RATE(CFS) =      46.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   4.97
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13512.00 =    1931.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13512.00 TO NODE  13513.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    954.27  DOWNSTREAM(FEET) =    872.45
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.42   CHANNEL SLOPE =  0.0425
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.52
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.640
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       90.23      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     101.64
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.52
 AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   5.82
 Tc(MIN.) =   24.41
 SUBAREA AREA(ACRES) =    90.23       SUBAREA RUNOFF(CFS) =  108.80
 EFFECTIVE AREA(ACRES) =    122.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      122.3         PEAK FLOW RATE(CFS) =     147.46
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =   6.17
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13513.00 =    3857.73 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13513.00 TO NODE  13514.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    872.45  DOWNSTREAM(FEET) =    813.12
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1895.66   CHANNEL SLOPE =  0.0313
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.458
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      135.65      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     218.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.23
 AVERAGE FLOW DEPTH(FEET) =   2.38   TRAVEL TIME(MIN.) =   5.07
 Tc(MIN.) =   29.49
 SUBAREA AREA(ACRES) =   135.65       SUBAREA RUNOFF(CFS) =  141.37
 EFFECTIVE AREA(ACRES) =    257.94     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      257.9         PEAK FLOW RATE(CFS) =     268.81
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.65
```



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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.65   FLOW VELOCITY(FEET/SEC.) =   6.62
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13514.00 =    5753.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13514.00 TO NODE  13515.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    813.12  DOWNSTREAM(FEET) =    773.74
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.15   CHANNEL SLOPE =  0.0204
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.28
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.339
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      109.30      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     319.95
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.96
 AVERAGE FLOW DEPTH(FEET) =   3.25   TRAVEL TIME(MIN.) =   5.39
 Tc(MIN.) =   34.87
 SUBAREA AREA(ACRES) =   109.30       SUBAREA RUNOFF(CFS) =  102.23
 EFFECTIVE AREA(ACRES) =    367.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      367.2         PEAK FLOW RATE(CFS) =     343.47
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.37

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.37   FLOW VELOCITY(FEET/SEC.) =   6.09
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13515.00 =    7679.54 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    773.74  DOWNSTREAM(FEET) =    717.04
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2279.49   CHANNEL SLOPE =  0.0249
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.69
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.228
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      231.44      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     440.23
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.99
```

```
  AVERAGE FLOW DEPTH(FEET) =   3.64   TRAVEL TIME(MIN.) =   5.43
  Tc(MIN.) =   40.31
  SUBAREA AREA(ACRES) =   231.44       SUBAREA RUNOFF(CFS) =  193.41
  EFFECTIVE AREA(ACRES) =    598.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      598.7         PEAK FLOW RATE(CFS) =     500.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.89   FLOW VELOCITY(FEET/SEC.) =   7.24
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13520.00 =    9959.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   40.31
  RAINFALL INTENSITY(INCH/HR) =   1.23
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     598.68
  TOTAL STREAM AREA(ACRES) =     598.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     500.31

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      285.41   48.77    1.103  0.30( 0.27) 0.89     379.5   13500.00
      2      500.31   40.31    1.228  0.30( 0.30) 1.00     598.7   13510.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      771.55   40.31    1.228  0.30( 0.29) 0.96     912.3   13510.00
      2      718.24   48.77    1.103  0.30( 0.29) 0.96     978.1   13500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     771.55    Tc(MIN.) =    40.31
  EFFECTIVE AREA(ACRES) =     912.29   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =      978.1
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13520.00 TO NODE  13520.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    717.04  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.22   CHANNEL SLOPE =  0.0084
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.151
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.31      0.30     0.965     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.965
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     846.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.43
  AVERAGE FLOW DEPTH(FEET) =   3.30   TRAVEL TIME(MIN.) =   5.23
  Tc(MIN.) =   45.54
  SUBAREA AREA(ACRES) =   193.31       SUBAREA RUNOFF(CFS) =  149.90
  EFFECTIVE AREA(ACRES) =   1105.60     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     1171.4         PEAK FLOW RATE(CFS) =     857.87
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.32   FLOW VELOCITY(FEET/SEC.) =   6.46
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.50 =   14246.39 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      857.87   45.54    1.151  0.30( 0.29) 0.96    1105.6   13510.00
      2      781.91   54.12    1.029  0.30( 0.29) 0.96    1171.4   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     857.87  Tc(MIN.) =   45.54
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1105.60

****************************************************************************
  FLOW PROCESS FROM NODE  13520.50 TO NODE  13521.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    661.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1622.36   CHANNEL SLOPE =  0.0235
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.108
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.79      0.30     0.897     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.897
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     906.88
```

```
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.33
 AVERAGE FLOW DEPTH(FEET) =   2.58   TRAVEL TIME(MIN.) =   2.90
 Tc(MIN.) =   48.44
 SUBAREA AREA(ACRES) =   129.79       SUBAREA RUNOFF(CFS) =   98.02
 EFFECTIVE AREA(ACRES) =   1235.39     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     1301.2         PEAK FLOW RATE(CFS) =     913.21
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.59

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.59   FLOW VELOCITY(FEET/SEC.) =   9.34
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13521.00 =   15868.75 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      913.21   48.44    1.108  0.30( 0.29) 0.96    1235.4   13510.00
     2      823.51   57.11    0.989  0.30( 0.29) 0.95    1301.2   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     913.21  Tc(MIN.) =   48.44
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1235.39

****************************************************************************
 FLOW PROCESS FROM NODE  13521.00 TO NODE  13522.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    661.95  DOWNSTREAM(FEET) =    632.19
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2746.01   CHANNEL SLOPE =  0.0108
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.41
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.023
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      278.60      0.30     0.905     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.905
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1007.42
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.40
 AVERAGE FLOW DEPTH(FEET) =   3.39   TRAVEL TIME(MIN.) =   6.19
 Tc(MIN.) =   54.62
 SUBAREA AREA(ACRES) =   278.60       SUBAREA RUNOFF(CFS) =  188.34
 EFFECTIVE AREA(ACRES) =   1513.99     AREA-AVERAGED Fm(INCH/HR) =   0.28
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
 TOTAL AREA(ACRES) =     1579.8         PEAK FLOW RATE(CFS) =    1006.43
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.38

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.38   FLOW VELOCITY(FEET/SEC.) =   7.41
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13522.00 =   18614.76 FEET.
```



```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1006.43   54.62    1.023  0.30( 0.28) 0.95    1514.0   13510.00
     2      918.96   63.50    0.930  0.30( 0.28) 0.94    1579.8   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1006.43  Tc(MIN.) =   54.62
 AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1513.99
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     1579.8  TC(MIN.) =     54.62
 EFFECTIVE AREA(ACRES) =   1513.99  AREA-AVERAGED Fm(INCH/HR)=  0.28
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.947
 PEAK FLOW RATE(CFS)   =    1006.43

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1006.43   54.62    1.023  0.30( 0.28) 0.95    1514.0   13510.00
     2      918.96   63.50    0.930  0.30( 0.28) 0.94    1579.8   13500.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S36.DAT
  TIME/DATE OF STUDY: 09:35 09/12/2017
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.766
   2)   10.00;  3.119
   3)   15.00;  2.394
   4)   20.00;  1.986
   5)   25.00;  1.734
   6)   30.00;  1.526
   7)   40.00;  1.325
   8)   50.00;  1.173
   9)   60.00;  1.046
  10)   90.00;  0.877
  11)  120.00;  0.765
  12)  180.00;  0.636
  13)  360.00;  0.466
  14) 1200.00;  0.204
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  13600.00 TO NODE  13600.50 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   488.61
  ELEVATION DATA: UPSTREAM(FEET) =    872.12  DOWNSTREAM(FEET) =    744.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.995
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.975
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        3.39      0.30     1.000     0   11.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.16
  TOTAL AREA(ACRES) =      3.39   PEAK FLOW RATE(CFS) =      8.16

************************************************************************
  FLOW PROCESS FROM NODE  13600.50 TO NODE  13601.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    744.80  DOWNSTREAM(FEET) =    707.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =   418.30   CHANNEL SLOPE =  0.0896
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.41
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.706
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.77
  AVERAGE FLOW DEPTH(FEET) =   0.40   TRAVEL TIME(MIN.) =   1.85
  Tc(MIN.) =   12.85
  SUBAREA AREA(ACRES) =     7.45       SUBAREA RUNOFF(CFS) =   16.13
  EFFECTIVE AREA(ACRES) =     10.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       10.8          PEAK FLOW RATE(CFS) =      23.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   4.33
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13601.00 =     906.91 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  13601.00 TO NODE  13602.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    707.32  DOWNSTREAM(FEET) =    657.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   777.60   CHANNEL SLOPE =  0.0646
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.364
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.14
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   2.52
  Tc(MIN.) =   15.37
  SUBAREA AREA(ACRES) =    30.96       SUBAREA RUNOFF(CFS) =   57.52
  EFFECTIVE AREA(ACRES) =     41.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.8         PEAK FLOW RATE(CFS) =      77.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.09   FLOW VELOCITY(FEET/SEC.) =   5.82
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13602.00 =    1684.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13602.00 TO NODE  13603.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.12  DOWNSTREAM(FEET) =    584.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1186.54   CHANNEL SLOPE =  0.0611
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.28
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.102
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      96.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.15
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =   18.58
  SUBAREA AREA(ACRES) =    23.36       SUBAREA RUNOFF(CFS) =   37.88
  EFFECTIVE AREA(ACRES) =     65.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       65.2         PEAK FLOW RATE(CFS) =     105.66
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   6.32
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13603.00 =    2871.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.58  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   860.98   CHANNEL SLOPE =  0.0461
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.56
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.937
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.99
  AVERAGE FLOW DEPTH(FEET) =   1.55   TRAVEL TIME(MIN.) =   2.39
  Tc(MIN.) =   20.98
  SUBAREA AREA(ACRES) =    21.24       SUBAREA RUNOFF(CFS) =   31.29
  EFFECTIVE AREA(ACRES) =     86.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       86.4         PEAK FLOW RATE(CFS) =     127.28
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.59   FLOW VELOCITY(FEET/SEC.) =   6.07
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S35.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1006.43   54.62  0.30( 0.28) 0.95    1514.0   13510.00
```

```
      2      918.96   63.50  0.30( 0.28) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =     1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER      (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1006.43   54.62  0.30( 0.28) 0.95    1514.0   13510.00
      2      918.96   63.50  0.30( 0.28) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =      1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13523.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    632.19  DOWNSTREAM(FEET) =    561.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1151.68   CHANNEL SLOPE =  0.0618
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.08
  CHANNEL FLOW THRU SUBAREA(CFS) =    1006.43
  FLOW VELOCITY(FEET/SEC.) =  13.37   FLOW DEPTH(FEET) =   2.08
  TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =   56.06
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1106.52   56.06    1.096  0.30( 0.28) 0.95    1514.0   13510.00
      2     1044.61   64.97    1.018  0.30( 0.28) 0.94    1579.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1106.52  Tc(MIN.) =   56.06
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1513.99

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610201W.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER      (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       73.72   14.55  0.30( 0.30) 1.00      37.9   20100.00
```



```
    TOTAL AREA(ACRES) =       37.9

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1106.52   56.06    1.096  0.30( 0.28) 0.95    1514.0   13510.00
      2     1044.61   64.97    1.018  0.30( 0.28) 0.94    1579.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       73.72   14.55    2.459  0.30( 0.30) 1.00      37.9   20100.00
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  13523.00 =    2767.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      843.02   14.55    2.459  0.30( 0.29) 0.95     430.9   20100.00
      2     1133.70   56.06    1.096  0.30( 0.28) 0.95    1551.9   13510.00
      3     1069.13   64.97    1.018  0.30( 0.28) 0.95    1617.8   13500.00
    TOTAL AREA(ACRES) =      1617.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1133.70  Tc(MIN.) =   56.059
  EFFECTIVE AREA(ACRES) =   1551.92  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1617.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13524.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    561.00  DOWNSTREAM(FEET) =    556.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   238.34   CHANNEL SLOPE =  0.0210
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01
  CHANNEL FLOW THRU SUBAREA(CFS) =    1133.70
  FLOW VELOCITY(FEET/SEC.) =   9.65   FLOW DEPTH(FEET) =   3.01
  TRAVEL TIME(MIN.) =   0.41   Tc(MIN.) =   56.47
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      843.02   15.00    2.394  0.30( 0.29) 0.95     430.9   20100.00
      2     1133.70   56.47    1.091  0.30( 0.28) 0.95    1551.9   13510.00
      3     1069.13   65.39    1.016  0.30( 0.28) 0.95    1617.8   13500.00
```

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1133.70  Tc(MIN.) =   56.47
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1551.92

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610202W.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       61.50   13.22  0.30( 0.30) 1.00      29.1   20210.00
      2       61.35   13.30  0.30( 0.30) 1.00      29.1   20200.00
    TOTAL AREA(ACRES) =       29.1

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      843.02   15.00    2.394  0.30( 0.29) 0.95     430.9   20100.00
      2     1133.70   56.47    1.091  0.30( 0.28) 0.95    1551.9   13510.00
      3     1069.13   65.39    1.016  0.30( 0.28) 0.95    1617.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       61.50   13.22    2.652  0.30( 0.30) 1.00      29.1   20210.00
      2       61.35   13.30    2.641  0.30( 0.30) 1.00      29.1   20200.00
  LONGEST FLOWPATH FROM NODE  20210.00 TO NODE  13524.00 =    2247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      895.38   13.22    2.652  0.30( 0.29) 0.95     408.8   20210.00
      2      896.08   13.30    2.641  0.30( 0.29) 0.95     411.0   20200.00
      3      897.89   15.00    2.394  0.30( 0.29) 0.95     460.0   20100.00
      4     1154.43   56.47    1.091  0.30( 0.28) 0.95    1581.0   13510.00
      5     1087.88   65.39    1.016  0.30( 0.28) 0.95    1646.9   13500.00
    TOTAL AREA(ACRES) =      1646.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1154.43  Tc(MIN.) =   56.471
  EFFECTIVE AREA(ACRES) =   1581.04  AREA-AVERAGED Fm(INCH/HR) =  0.28
```



```
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1646.9
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.00  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   672.93   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.075
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.94      0.30     0.884     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.884
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1164.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.95
  AVERAGE FLOW DEPTH(FEET) =   3.27   TRAVEL TIME(MIN.) =   1.25
  Tc(MIN.) =   57.72
  SUBAREA AREA(ACRES) =    27.94       SUBAREA RUNOFF(CFS) =   20.36
  EFFECTIVE AREA(ACRES) =   1608.98     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =     1674.8          PEAK FLOW RATE(CFS) =    1154.43
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.25   FLOW VELOCITY(FEET/SEC.) =   8.92
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      895.38   14.57    2.456  0.30( 0.29) 0.95     436.7   20210.00
      2      896.08   14.64    2.446  0.30( 0.29) 0.95     438.9   20200.00
      3      897.89   16.35    2.284  0.30( 0.29) 0.95     488.0   20100.00
      4     1154.43   57.72    1.075  0.30( 0.28) 0.95    1609.0   13510.00
      5     1092.46   66.67    1.008  0.30( 0.28) 0.95    1674.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1154.43  Tc(MIN.) =   57.72
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1608.98

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       895.38   14.57    2.456  0.30( 0.29) 0.95     436.7   20210.00
     2       896.08   14.64    2.446  0.30( 0.29) 0.95     438.9   20200.00
     3       897.89   16.35    2.284  0.30( 0.29) 0.95     488.0   20100.00
     4      1154.43   57.72    1.075  0.30( 0.28) 0.95    1609.0   13510.00
     5      1092.46   66.67    1.008  0.30( 0.28) 0.95    1674.8   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       127.28   20.98    1.937  0.30( 0.30) 1.00      86.4   13600.00
 LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      1011.85   14.57    2.456  0.30( 0.29) 0.96     496.8   20210.00
     2      1012.56   14.64    2.446  0.30( 0.29) 0.96     499.2   20200.00
     3      1018.13   16.35    2.284  0.30( 0.29) 0.96     555.3   20100.00
     4      1053.85   20.98    1.937  0.30( 0.29) 0.96     699.7   13600.00
     5      1214.69   57.72    1.075  0.30( 0.29) 0.95    1695.4   13510.00
     6      1147.56   66.67    1.008  0.30( 0.28) 0.95    1761.2   13500.00
    TOTAL AREA(ACRES) =      1761.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1214.69  Tc(MIN.) =   57.724
 EFFECTIVE AREA(ACRES) =   1695.38  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     1761.2
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13620.00 TO NODE  13621.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    544.91  DOWNSTREAM(FEET) =    527.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   868.57   CHANNEL SLOPE =  0.0206
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.15
 CHANNEL FLOW THRU SUBAREA(CFS) =    1214.69
 FLOW VELOCITY(FEET/SEC.) =   9.79   FLOW DEPTH(FEET) =   3.15
 TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =   59.20
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      1011.85   16.14    2.301  0.30( 0.29) 0.96     496.8   20210.00
     2      1012.56   16.21    2.295  0.30( 0.29) 0.96     499.2   20200.00
     3      1018.13   17.91    2.156  0.30( 0.29) 0.96     555.3   20100.00
     4      1053.85   22.52    1.859  0.30( 0.29) 0.96     699.7   13600.00
     5      1214.69   59.20    1.056  0.30( 0.29) 0.95    1695.4   13510.00
```



```
     6      1147.56   68.18    1.000  0.30( 0.28) 0.95    1761.2   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1214.69  Tc(MIN.) =   59.20
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1695.38

****************************************************************************
 FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610203W.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM        Q      Tc      Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       56.75   13.58  0.30( 0.30) 1.00      27.4   20300.00
   TOTAL AREA(ACRES) =       27.4

****************************************************************************
 FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      1011.85   16.14    2.301  0.30( 0.29) 0.96     496.8   20210.00
     2      1012.56   16.21    2.295  0.30( 0.29) 0.96     499.2   20200.00
     3      1018.13   17.91    2.156  0.30( 0.29) 0.96     555.3   20100.00
     4      1053.85   22.52    1.859  0.30( 0.29) 0.96     699.7   13600.00
     5      1214.69   59.20    1.056  0.30( 0.29) 0.95    1695.4   13510.00
     6      1147.56   68.18    1.000  0.30( 0.28) 0.95    1761.2   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       56.75   13.58    2.600  0.30( 0.30) 1.00      27.4   20300.00
 LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  13621.00 =    2609.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      1034.55   13.58    2.600  0.30( 0.29) 0.96     445.5   20300.00
     2      1061.24   16.14    2.301  0.30( 0.29) 0.96     524.2   20210.00
     3      1061.80   16.21    2.295  0.30( 0.29) 0.96     526.6   20200.00
     4      1063.94   17.91    2.156  0.30( 0.29) 0.96     582.7   20100.00
     5      1092.32   22.52    1.859  0.30( 0.29) 0.96     727.1   13600.00
     6      1233.35   59.20    1.056  0.30( 0.29) 0.95    1722.8   13510.00
     7      1164.83   68.18    1.000  0.30( 0.28) 0.95    1788.6   13500.00
   TOTAL AREA(ACRES) =      1788.6
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1233.35  Tc(MIN.) =   59.203
  EFFECTIVE AREA(ACRES) =   1722.80  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1788.6
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13622.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    527.00  DOWNSTREAM(FEET) =    512.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    56.08   CHANNEL SLOPE =  0.2675
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.53
  CHANNEL FLOW THRU SUBAREA(CFS) =    1233.35
  FLOW VELOCITY(FEET/SEC.) =  23.29   FLOW DEPTH(FEET) =   1.53
  TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =   59.24
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1034.55   13.62    2.594  0.30( 0.29) 0.96     445.5   20300.00
      2     1061.24   16.18    2.298  0.30( 0.29) 0.96     524.2   20210.00
      3     1061.80   16.25    2.292  0.30( 0.29) 0.96     526.6   20200.00
      4     1063.94   17.96    2.153  0.30( 0.29) 0.96     582.7   20100.00
      5     1092.32   22.56    1.857  0.30( 0.29) 0.96     727.1   13600.00
      6     1233.35   59.24    1.056  0.30( 0.29) 0.95    1722.8   13510.00
      7     1164.83   68.22    1.000  0.30( 0.28) 0.95    1788.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1233.35  Tc(MIN.) =   59.24
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1722.80

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610204W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       68.11   13.21  0.30( 0.30) 1.00      32.2   20400.00
    TOTAL AREA(ACRES) =       32.2

****************************************************************************
```



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  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1034.55   13.62    2.594  0.30( 0.29) 0.96     445.5   20300.00
      2     1061.24   16.18    2.298  0.30( 0.29) 0.96     524.2   20210.00
      3     1061.80   16.25    2.292  0.30( 0.29) 0.96     526.6   20200.00
      4     1063.94   17.96    2.153  0.30( 0.29) 0.96     582.7   20100.00
      5     1092.32   22.56    1.857  0.30( 0.29) 0.96     727.1   13600.00
      6     1233.35   59.24    1.056  0.30( 0.29) 0.95    1722.8   13510.00
      7     1164.83   68.22    1.000  0.30( 0.28) 0.95    1788.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       68.11   13.21    2.653  0.30( 0.30) 1.00      32.2   20400.00
  LONGEST FLOWPATH FROM NODE  20400.00 TO NODE  13622.00 =    2281.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1097.37   13.21    2.653  0.30( 0.29) 0.96     464.2   20400.00
      2     1100.93   13.62    2.594  0.30( 0.29) 0.96     477.7   20300.00
      3     1119.06   16.18    2.298  0.30( 0.29) 0.96     556.3   20210.00
      4     1119.45   16.25    2.292  0.30( 0.29) 0.96     558.8   20200.00
      5     1117.56   17.96    2.153  0.30( 0.29) 0.96     614.9   20100.00
      6     1137.38   22.56    1.857  0.30( 0.29) 0.96     759.3   13600.00
      7     1255.22   59.24    1.056  0.30( 0.29) 0.95    1755.0   13510.00
      8     1185.08   68.22    1.000  0.30( 0.28) 0.95    1820.8   13500.00
    TOTAL AREA(ACRES) =      1820.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1255.22  Tc(MIN.) =   59.243
  EFFECTIVE AREA(ACRES) =   1754.96  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1820.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13640.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    512.00  DOWNSTREAM(FEET) =    489.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.72   CHANNEL SLOPE =  0.0500
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.55
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.048
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
 USER-DEFINED               -      112.88      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1293.24
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.51
 AVERAGE FLOW DEPTH(FEET) =   2.54   TRAVEL TIME(MIN.) =   0.57
 Tc(MIN.) =   59.81
 SUBAREA AREA(ACRES) =   112.88       SUBAREA RUNOFF(CFS) =   76.04
 EFFECTIVE AREA(ACRES) =   1867.84     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     1933.7          PEAK FLOW RATE(CFS) =    1280.84
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.53

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.53   FLOW VELOCITY(FEET/SEC.) =  13.48
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1183.46   13.79    2.569  0.30( 0.29) 0.97     577.1   20400.00
     2     1179.40   14.20    2.510  0.30( 0.29) 0.97     590.6   20300.00
     3     1180.75   16.76    2.251  0.30( 0.29) 0.97     669.2   20210.00
     4     1181.52   16.83    2.245  0.30( 0.29) 0.97     671.7   20200.00
     5     1189.19   18.53    2.106  0.30( 0.29) 0.97     727.8   20100.00
     6     1207.43   23.14    1.828  0.30( 0.29) 0.97     872.2   13600.00
     7     1280.84   59.81    1.048  0.30( 0.29) 0.96    1867.8   13510.00
     8     1236.71   68.79    0.996  0.30( 0.29) 0.95    1933.7   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1280.84  Tc(MIN.) =   59.81
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1867.84

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610205W.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       19.00   11.37  0.30( 0.30) 1.00       8.1   20500.00
   TOTAL AREA(ACRES) =        8.1

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1183.46   13.79    2.569  0.30( 0.29) 0.97     577.1   20400.00
     2     1179.40   14.20    2.510  0.30( 0.29) 0.97     590.6   20300.00
```



```
     3     1180.75   16.76    2.251  0.30( 0.29) 0.97     669.2   20210.00
     4     1181.52   16.83    2.245  0.30( 0.29) 0.97     671.7   20200.00
     5     1189.19   18.53    2.106  0.30( 0.29) 0.97     727.8   20100.00
     6     1207.43   23.14    1.828  0.30( 0.29) 0.97     872.2   13600.00
     7     1280.84   59.81    1.048  0.30( 0.29) 0.96    1867.8   13510.00
     8     1236.71   68.79    0.996  0.30( 0.29) 0.95    1933.7   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       19.00   11.37    2.921  0.30( 0.30) 1.00       8.1   20500.00
 LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  13640.00 =    1025.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1144.95   11.37    2.921  0.30( 0.29) 0.97     483.8   20500.00
     2     1199.91   13.79    2.569  0.30( 0.29) 0.97     585.1   20400.00
     3     1195.42   14.20    2.510  0.30( 0.29) 0.97     598.6   20300.00
     4     1194.90   16.76    2.251  0.30( 0.29) 0.97     677.3   20210.00
     5     1195.62   16.83    2.245  0.30( 0.29) 0.97     679.7   20200.00
     6     1202.28   18.53    2.106  0.30( 0.29) 0.97     735.8   20100.00
     7     1218.51   23.14    1.828  0.30( 0.29) 0.97     880.2   13600.00
     8     1286.27   59.81    1.048  0.30( 0.29) 0.96    1875.9   13510.00
     9     1241.76   68.79    0.996  0.30( 0.29) 0.95    1941.7   13500.00
   TOTAL AREA(ACRES) =      1941.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1286.27  Tc(MIN.) =   59.810
 EFFECTIVE AREA(ACRES) =   1875.90  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =     1941.7
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13641.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    489.00  DOWNSTREAM(FEET) =    436.89
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2992.90   CHANNEL SLOPE =  0.0174
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.49
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.018
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      180.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1344.50
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.52
 AVERAGE FLOW DEPTH(FEET) =   3.49   TRAVEL TIME(MIN.) =   5.24
 Tc(MIN.) =   65.05
 SUBAREA AREA(ACRES) =   180.31       SUBAREA RUNOFF(CFS) =  116.46
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  EFFECTIVE AREA(ACRES) =   2056.21     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     2122.0         PEAK FLOW RATE(CFS) =    1350.63
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.50   FLOW VELOCITY(FEET/SEC.) =   9.54
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13641.00 =   25054.98 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1175.02   16.65    2.259  0.30( 0.29) 0.98     664.1   20500.00
      2     1221.24   19.02    2.066  0.30( 0.29) 0.98     765.5   20400.00
      3     1218.66   19.44    2.031  0.30( 0.29) 0.98     778.9   20300.00
      4     1228.62   22.02    1.884  0.30( 0.29) 0.97     857.6   20210.00
      5     1229.39   22.09    1.881  0.30( 0.29) 0.97     860.0   20200.00
      6     1238.90   23.80    1.795  0.30( 0.29) 0.97     916.1   20100.00
      7     1241.81   28.41    1.592  0.30( 0.29) 0.97    1060.5   13600.00
      8     1350.63   65.05    1.018  0.30( 0.29) 0.96    2056.2   13510.00
      9     1297.88   74.08    0.967  0.30( 0.29) 0.96    2122.0   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1350.63  Tc(MIN.) =   65.05
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    2056.21

****************************************************************************
  FLOW PROCESS FROM NODE  13641.00 TO NODE  13642.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.89  DOWNSTREAM(FEET) =    394.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2814.16   CHANNEL SLOPE =  0.0150
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.989
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      451.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1490.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.32
  AVERAGE FLOW DEPTH(FEET) =   3.85   TRAVEL TIME(MIN.) =   5.03
  Tc(MIN.) =   70.08
  SUBAREA AREA(ACRES) =   451.39       SUBAREA RUNOFF(CFS) =  280.02
  EFFECTIVE AREA(ACRES) =   2507.60     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     2573.4         PEAK FLOW RATE(CFS) =    1578.22
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.97
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.97   FLOW VELOCITY(FEET/SEC.) =   9.49
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13642.00 =   27869.14 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1612.11   21.67    1.902  0.30( 0.30) 0.99    1115.5   20500.00
      2     1629.36   24.02    1.783  0.30( 0.30) 0.99    1216.8   20400.00
      3     1623.87   24.44    1.762  0.30( 0.30) 0.99    1230.3   20300.00
      4     1595.46   27.04    1.649  0.30( 0.29) 0.98    1309.0   20210.00
      5     1595.03   27.11    1.646  0.30( 0.29) 0.98    1311.4   20200.00
      6     1576.05   28.82    1.575  0.30( 0.29) 0.98    1367.5   20100.00
      7     1582.30   33.45    1.457  0.30( 0.29) 0.98    1511.9   13600.00
      8     1578.22   70.08    0.989  0.30( 0.29) 0.97    2507.6   13510.00
      9     1502.27   79.18    0.938  0.30( 0.29) 0.96    2573.4   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1629.36  Tc(MIN.) =   24.02
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1216.84

****************************************************************************
  FLOW PROCESS FROM NODE  13642.00 TO NODE  13643.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    394.80  DOWNSTREAM(FEET) =    342.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2913.57   CHANNEL SLOPE =  0.0180
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.20
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.585
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      434.58      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1880.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.67
  AVERAGE FLOW DEPTH(FEET) =   4.15   TRAVEL TIME(MIN.) =   4.55
  Tc(MIN.) =   28.57
  SUBAREA AREA(ACRES) =   434.58       SUBAREA RUNOFF(CFS) =  502.76
  EFFECTIVE AREA(ACRES) =   1651.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3008.0         PEAK FLOW RATE(CFS) =    1915.27
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.19   FLOW VELOCITY(FEET/SEC.) =  10.73
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13643.00 =   30782.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
      1     1933.68   26.22    1.683  0.30( 0.30) 0.99    1550.0   20500.00
      2     1915.27   28.57    1.585  0.30( 0.30) 0.99    1651.4   20400.00
      3     1904.45   29.00    1.568  0.30( 0.30) 0.99    1664.9   20300.00
      4     1878.37   31.63    1.493  0.30( 0.30) 0.99    1743.6   20210.00
      5     1879.03   31.69    1.492  0.30( 0.30) 0.99    1746.0   20200.00
      6     1883.39   33.43    1.457  0.30( 0.30) 0.99    1802.1   20100.00
      7     1872.20   38.06    1.364  0.30( 0.30) 0.98    1946.5   13600.00
      8     1777.94   74.76    0.963  0.30( 0.29) 0.97    2942.2   13510.00
      9     1679.19   83.94    0.911  0.30( 0.29) 0.97    3008.0   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1933.68  Tc(MIN.) =   26.22
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1550.03

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    342.39  DOWNSTREAM(FEET) =    300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1591.23   CHANNEL SLOPE =  0.0266
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.595
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      109.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1997.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.46
  AVERAGE FLOW DEPTH(FEET) =   3.86   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =   28.35
  SUBAREA AREA(ACRES) =   109.24       SUBAREA RUNOFF(CFS) =  127.30
  EFFECTIVE AREA(ACRES) =   1659.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3117.3         PEAK FLOW RATE(CFS) =    1937.47
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.79   FLOW VELOCITY(FEET/SEC.) =  12.34
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1937.47   28.35    1.595  0.30( 0.30) 0.99    1659.3   20500.00
      2     1925.01   30.71    1.512  0.30( 0.30) 0.99    1760.7   20400.00
      3     1926.09   31.14    1.503  0.30( 0.30) 0.99    1774.1   20300.00
      4     1923.69   33.78    1.450  0.30( 0.30) 0.99    1852.8   20210.00
      5     1924.14   33.84    1.449  0.30( 0.30) 0.99    1855.3   20200.00
      6     1922.86   35.57    1.414  0.30( 0.30) 0.99    1911.3   20100.00
      7     1898.76   40.21    1.322  0.30( 0.30) 0.99    2055.7   13600.00
```



```
      8     1809.21   76.96    0.950  0.30( 0.29) 0.97    3051.4   13510.00
      9     1704.05   86.17    0.899  0.30( 0.29) 0.97    3117.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1937.47  Tc(MIN.) =   28.35
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1659.27

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610206W.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      260.62   22.57  0.30( 0.30) 1.00     186.0   20600.00
    TOTAL AREA(ACRES) =      186.0

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1937.47   28.35    1.595  0.30( 0.30) 0.99    1659.3   20500.00
      2     1925.01   30.71    1.512  0.30( 0.30) 0.99    1760.7   20400.00
      3     1926.09   31.14    1.503  0.30( 0.30) 0.99    1774.1   20300.00
      4     1923.69   33.78    1.450  0.30( 0.30) 0.99    1852.8   20210.00
      5     1924.14   33.84    1.449  0.30( 0.30) 0.99    1855.3   20200.00
      6     1922.86   35.57    1.414  0.30( 0.30) 0.99    1911.3   20100.00
      7     1898.76   40.21    1.322  0.30( 0.30) 0.99    2055.7   13600.00
      8     1809.21   76.96    0.950  0.30( 0.29) 0.97    3051.4   13510.00
      9     1704.05   86.17    0.899  0.30( 0.29) 0.97    3117.3   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      260.62   22.57    1.856  0.30( 0.30) 1.00     186.0   20600.00
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  13660.00 =    6967.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2114.46   22.57    1.856  0.30( 0.30) 0.99    1507.3   20600.00
      2     2154.28   28.35    1.595  0.30( 0.30) 0.99    1845.3   20500.00
      3     2127.93   30.71    1.512  0.30( 0.30) 0.99    1946.7   20400.00
      4     2127.56   31.14    1.503  0.30( 0.30) 0.99    1960.2   20300.00
```

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      5     2116.27   33.78    1.450  0.30( 0.30) 0.99    2038.8   20210.00
      6     2116.52   33.84    1.449  0.30( 0.30) 0.99    2041.3   20200.00
      7     2109.40   35.57    1.414  0.30( 0.30) 0.99    2097.4   20100.00
      8     2069.86   40.21    1.322  0.30( 0.30) 0.99    2241.8   13600.00
      9     1918.15   76.96    0.950  0.30( 0.29) 0.97    3237.4   13510.00
     10     1804.29   86.17    0.899  0.30( 0.29) 0.97    3303.3   13500.00
    TOTAL AREA(ACRES) =      3303.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2154.28  Tc(MIN.) =   28.349
  EFFECTIVE AREA(ACRES) =   1845.30  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3303.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    300.00  DOWNSTREAM(FEET) =    288.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   933.89   CHANNEL SLOPE =  0.0128
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.93
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.529
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2188.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.91
  AVERAGE FLOW DEPTH(FEET) =   4.93   TRAVEL TIME(MIN.) =   1.57
  Tc(MIN.) =   29.92
  SUBAREA AREA(ACRES) =    61.43       SUBAREA RUNOFF(CFS) =   67.97
  EFFECTIVE AREA(ACRES) =   1906.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3364.7         PEAK FLOW RATE(CFS) =    2154.28
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.89   FLOW VELOCITY(FEET/SEC.) =   9.87
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2114.46   24.15    1.777  0.30( 0.30) 0.99    1568.7   20600.00
      2     2154.28   29.92    1.529  0.30( 0.30) 0.99    1906.7   20500.00
      3     2137.65   32.29    1.480  0.30( 0.30) 0.99    2008.1   20400.00
      4     2136.41   32.71    1.471  0.30( 0.30) 0.99    2021.6   20300.00
      5     2119.84   35.36    1.418  0.30( 0.30) 0.99    2100.3   20210.00
```



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      6     2119.95   35.42    1.417  0.30( 0.30) 0.99    2102.7   20200.00
      7     2109.40   37.16    1.382  0.30( 0.30) 0.99    2158.8   20100.00
      8     2076.24   41.80    1.298  0.30( 0.30) 0.99    2303.2   13600.00
      9     1926.86   78.58    0.941  0.30( 0.29) 0.97    3298.9   13510.00
     10     1809.09   87.83    0.889  0.30( 0.29) 0.97    3364.7   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2154.28  Tc(MIN.) =   29.92
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1906.73

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610207W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      315.33   16.34  0.30( 0.28) 0.92     174.5   20700.00
    TOTAL AREA(ACRES) =      174.5

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2114.46   24.15    1.777  0.30( 0.30) 0.99    1568.7   20600.00
      2     2154.28   29.92    1.529  0.30( 0.30) 0.99    1906.7   20500.00
      3     2137.65   32.29    1.480  0.30( 0.30) 0.99    2008.1   20400.00
      4     2136.41   32.71    1.471  0.30( 0.30) 0.99    2021.6   20300.00
      5     2119.84   35.36    1.418  0.30( 0.30) 0.99    2100.3   20210.00
      6     2119.95   35.42    1.417  0.30( 0.30) 0.99    2102.7   20200.00
      7     2109.40   37.16    1.382  0.30( 0.30) 0.99    2158.8   20100.00
      8     2076.24   41.80    1.298  0.30( 0.30) 0.99    2303.2   13600.00
      9     1926.86   78.58    0.941  0.30( 0.29) 0.97    3298.9   13510.00
     10     1809.09   87.83    0.889  0.30( 0.29) 0.97    3364.7   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      315.33   16.34    2.285  0.30( 0.28) 0.92     174.5   20700.00
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  13680.00 =    6221.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
      1     2237.15   16.34    2.285  0.30( 0.29) 0.98    1235.8   20700.00
      2     2350.02   24.15    1.777  0.30( 0.30) 0.99    1743.2   20600.00
      3     2350.98   29.92    1.529  0.30( 0.30) 0.99    2081.2   20500.00
      4     2326.61   32.29    1.480  0.30( 0.30) 0.99    2182.6   20400.00
      5     2324.02   32.71    1.471  0.30( 0.30) 0.99    2196.1   20300.00
      6     2299.10   35.36    1.418  0.30( 0.30) 0.98    2274.8   20210.00
      7     2299.01   35.42    1.417  0.30( 0.30) 0.98    2277.2   20200.00
      8     2282.99   37.16    1.382  0.30( 0.30) 0.98    2333.3   20100.00
      9     2236.53   41.80    1.298  0.30( 0.29) 0.98    2477.7   13600.00
     10     2031.20   78.58    0.941  0.30( 0.29) 0.97    3473.4   13510.00
     11     1905.25   87.83    0.889  0.30( 0.29) 0.97    3539.2   13500.00
    TOTAL AREA(ACRES) =      3539.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2350.98  Tc(MIN.) =   29.920
  EFFECTIVE AREA(ACRES) =   2081.24  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3539.2
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.00  DOWNSTREAM(FEET) =    242.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.77   CHANNEL SLOPE =  0.0161
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.90
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.441
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2408.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.03
  AVERAGE FLOW DEPTH(FEET) =   4.89   TRAVEL TIME(MIN.) =   4.32
  Tc(MIN.) =   34.24
  SUBAREA AREA(ACRES) =   112.53       SUBAREA RUNOFF(CFS) =  115.54
  EFFECTIVE AREA(ACRES) =   2193.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3651.8         PEAK FLOW RATE(CFS) =    2350.98
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.82   FLOW VELOCITY(FEET/SEC.) =  10.96
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```



```
      1     2237.15   20.71    1.950  0.30( 0.30) 0.98    1348.4   20700.00
      2     2350.02   28.47    1.590  0.30( 0.30) 0.99    1855.7   20600.00
      3     2350.98   34.24    1.441  0.30( 0.30) 0.99    2193.8   20500.00
      4     2326.61   36.62    1.393  0.30( 0.30) 0.99    2295.2   20400.00
      5     2324.02   37.05    1.384  0.30( 0.30) 0.99    2308.6   20300.00
      6     2299.10   39.71    1.331  0.30( 0.30) 0.99    2387.3   20210.00
      7     2299.01   39.77    1.330  0.30( 0.30) 0.99    2389.8   20200.00
      8     2282.99   41.51    1.302  0.30( 0.30) 0.98    2445.8   20100.00
      9     2236.53   46.19    1.231  0.30( 0.29) 0.98    2590.2   13600.00
     10     2031.20   83.11    0.916  0.30( 0.29) 0.97    3585.9   13510.00
     11     1905.25   92.44    0.868  0.30( 0.29) 0.97    3651.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2350.98  Tc(MIN.) =   34.24
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2193.77

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610208W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      307.78   15.76  0.30( 0.30) 0.99     168.1   20810.00
      2      298.67   18.80  0.30( 0.30) 0.99     185.8   20800.00
    TOTAL AREA(ACRES) =      185.8

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2237.15   20.71    1.950  0.30( 0.30) 0.98    1348.4   20700.00
      2     2350.02   28.47    1.590  0.30( 0.30) 0.99    1855.7   20600.00
      3     2350.98   34.24    1.441  0.30( 0.30) 0.99    2193.8   20500.00
      4     2326.61   36.62    1.393  0.30( 0.30) 0.99    2295.2   20400.00
      5     2324.02   37.05    1.384  0.30( 0.30) 0.99    2308.6   20300.00
      6     2299.10   39.71    1.331  0.30( 0.30) 0.99    2387.3   20210.00
      7     2299.01   39.77    1.330  0.30( 0.30) 0.99    2389.8   20200.00
      8     2282.99   41.51    1.302  0.30( 0.30) 0.98    2445.8   20100.00
      9     2236.53   46.19    1.231  0.30( 0.29) 0.98    2590.2   13600.00
     10     2031.20   83.11    0.916  0.30( 0.29) 0.97    3585.9   13510.00
     11     1905.25   92.44    0.868  0.30( 0.29) 0.97    3651.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	307.78	15.76	2.332	0.30(0.30)	0.99	168.1	20810.00
2	298.67	18.80	2.084	0.30(0.30)	0.99	185.8	20800.00

LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 13682.00 = 5285.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2402.79	15.76	2.332	0.30(0.30)	0.99	1194.0	20810.00
2	2493.45	18.80	2.084	0.30(0.30)	0.99	1409.6	20800.00
3	2513.41	20.71	1.950	0.30(0.30)	0.99	1534.2	20700.00
4	2565.99	28.47	1.590	0.30(0.30)	0.99	2041.5	20600.00
5	2542.05	34.24	1.441	0.30(0.30)	0.99	2379.6	20500.00
6	2509.69	36.62	1.393	0.30(0.30)	0.99	2481.0	20400.00
7	2505.64	37.05	1.384	0.30(0.30)	0.99	2494.4	20300.00
8	2471.78	39.71	1.331	0.30(0.30)	0.99	2573.1	20210.00
9	2471.48	39.77	1.330	0.30(0.30)	0.99	2575.6	20200.00
10	2450.85	41.51	1.302	0.30(0.30)	0.99	2631.7	20100.00
11	2392.50	46.19	1.231	0.30(0.30)	0.98	2776.0	13600.00
12	2134.47	83.11	0.916	0.30(0.29)	0.97	3771.7	13510.00
13	2000.50	92.44	0.868	0.30(0.29)	0.97	3837.6	13500.00

TOTAL AREA(ACRES) = 3837.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 2565.99 Tc(MIN.) = 28.470
EFFECTIVE AREA(ACRES) = 2041.54 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3837.6
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

****
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.50 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 242.00 DOWNSTREAM(FEET) = 230.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 660.20 CHANNEL SLOPE = 0.0182
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.89
CHANNEL FLOW THRU SUBAREA(CFS) = 2565.99
FLOW VELOCITY(FEET/SEC.) = 11.74 FLOW DEPTH(FEET) = 4.89
TRAVEL TIME(MIN.) = 0.94 Tc(MIN.) = 29.41
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2402.79	16.71	2.254	0.30(0.30)	0.99	1194.0	20810.00
2	2493.45	19.74	2.007	0.30(0.30)	0.99	1409.6	20800.00
3	2513.41	21.66	1.903	0.30(0.30)	0.99	1534.2	20700.00
4	2565.99	29.41	1.551	0.30(0.30)	0.99	2041.5	20600.00
5	2542.05	35.18	1.422	0.30(0.30)	0.99	2379.6	20500.00
6	2509.69	37.56	1.374	0.30(0.30)	0.99	2481.0	20400.00
7	2505.64	38.00	1.365	0.30(0.30)	0.99	2494.4	20300.00
8	2471.78	40.66	1.315	0.30(0.30)	0.99	2573.1	20210.00

9	2471.48	40.72	1.314	0.30(0.30)	0.99	2575.6	20200.00
10	2450.85	42.46	1.288	0.30(0.30)	0.99	2631.7	20100.00
11	2392.50	47.15	1.216	0.30(0.30)	0.98	2776.0	13600.00
12	2134.47	84.10	0.910	0.30(0.29)	0.97	3771.7	13510.00
13	2000.50	93.45	0.864	0.30(0.29)	0.97	3837.6	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 2565.99 Tc(MIN.) = 29.41
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2041.54

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610209W.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	133.07	17.06	0.30(0.30)	1.00	76.8	20900.00

TOTAL AREA(ACRES) = 76.8

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2402.79	16.71	2.254	0.30(0.30)	0.99	1194.0	20810.00
2	2493.45	19.74	2.007	0.30(0.30)	0.99	1409.6	20800.00
3	2513.41	21.66	1.903	0.30(0.30)	0.99	1534.2	20700.00
4	2565.99	29.41	1.551	0.30(0.30)	0.99	2041.5	20600.00
5	2542.05	35.18	1.422	0.30(0.30)	0.99	2379.6	20500.00
6	2509.69	37.56	1.374	0.30(0.30)	0.99	2481.0	20400.00
7	2505.64	38.00	1.365	0.30(0.30)	0.99	2494.4	20300.00
8	2471.78	40.66	1.315	0.30(0.30)	0.99	2573.1	20210.00
9	2471.48	40.72	1.314	0.30(0.30)	0.99	2575.6	20200.00
10	2450.85	42.46	1.288	0.30(0.30)	0.99	2631.7	20100.00
11	2392.50	47.15	1.216	0.30(0.30)	0.98	2776.0	13600.00
12	2134.47	84.10	0.910	0.30(0.29)	0.97	3771.7	13510.00
13	2000.50	93.45	0.864	0.30(0.29)	0.97	3837.6	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	133.07	17.06	2.226	0.30(0.30)	1.00	76.8	20900.00

LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 13682.50 = 4089.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2535.08	16.71	2.254	0.30(0.30)	0.99	1269.2	20810.00
2	2546.14	17.06	2.226	0.30(0.30)	0.99	1295.2	20900.00
3	2611.38	19.74	2.007	0.30(0.30)	0.99	1486.3	20800.00
4	2624.13	21.66	1.903	0.30(0.30)	0.99	1610.9	20700.00
5	2652.40	29.41	1.551	0.30(0.30)	0.99	2118.3	20600.00
6	2619.56	35.18	1.422	0.30(0.30)	0.99	2456.3	20500.00
7	2583.89	37.56	1.374	0.30(0.30)	0.99	2557.7	20400.00
8	2579.24	38.00	1.365	0.30(0.30)	0.99	2571.2	20300.00
9	2541.91	40.66	1.315	0.30(0.30)	0.99	2649.9	20210.00
10	2541.54	40.72	1.314	0.30(0.30)	0.99	2652.3	20200.00
11	2519.08	42.46	1.288	0.30(0.30)	0.99	2708.4	20100.00
12	2455.81	47.15	1.216	0.30(0.30)	0.98	2852.8	13600.00
13	2176.64	84.10	0.910	0.30(0.29)	0.97	3848.5	13510.00
14	2039.48	93.45	0.864	0.30(0.29)	0.97	3914.3	13500.00

TOTAL AREA(ACRES) = 3914.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 2652.40 Tc(MIN.) = 29.408
EFFECTIVE AREA(ACRES) = 2118.29 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3914.3
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13683.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 230.00 DOWNSTREAM(FEET) = 208.53
CHANNEL LENGTH THRU SUBAREA(FEET) = 1866.20 CHANNEL SLOPE = 0.0115
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.66
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.476
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.32	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2685.38
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.11
AVERAGE FLOW DEPTH(FEET) = 5.66 TRAVEL TIME(MIN.) = 3.08
Tc(MIN.) = 32.48
SUBAREA AREA(ACRES) = 62.32 SUBAREA RUNOFF(CFS) = 65.97
EFFECTIVE AREA(ACRES) = 2180.61 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3976.6 PEAK FLOW RATE(CFS) = 2652.40
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.62 FLOW VELOCITY(FEET/SEC.) = 10.07
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13683.00 = 38695.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2535.08	19.83	2.000	0.30(0.30)	0.99	1331.6	20810.00
2	2546.14	20.16	1.978	0.30(0.30)	0.99	1357.6	20900.00
3	2611.38	22.83	1.843	0.30(0.30)	0.99	1548.7	20800.00
4	2624.13	24.74	1.747	0.30(0.30)	0.99	1673.3	20700.00
5	2652.40	32.48	1.476	0.30(0.30)	0.99	2180.6	20600.00
6	2619.56	38.27	1.360	0.30(0.30)	0.99	2518.7	20500.00
7	2583.89	40.66	1.315	0.30(0.30)	0.99	2620.0	20400.00
8	2579.24	41.10	1.308	0.30(0.30)	0.99	2633.5	20300.00
9	2541.91	43.77	1.268	0.30(0.30)	0.99	2712.2	20210.00
10	2541.54	43.84	1.267	0.30(0.30)	0.99	2714.6	20200.00
11	2519.08	45.59	1.240	0.30(0.30)	0.99	2770.7	20100.00
12	2455.81	50.30	1.169	0.30(0.30)	0.98	2915.1	13600.00
13	2176.64	87.36	0.892	0.30(0.29)	0.97	3910.8	13510.00
14	2039.48	96.77	0.852	0.30(0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 2652.40 Tc(MIN.) = 32.48
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2180.61

****
FLOW PROCESS FROM NODE 13683.00 TO NODE 13684.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 208.53 DOWNSTREAM(FEET) = 200.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 166.32 CHANNEL SLOPE = 0.0513
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.76
CHANNEL FLOW THRU SUBAREA(CFS) = 2652.40
FLOW VELOCITY(FEET/SEC.) = 17.06 FLOW DEPTH(FEET) = 3.76
TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 32.65
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2535.08	19.99	1.987	0.30(0.30)	0.99	1331.6	20810.00
2	2546.14	20.33	1.969	0.30(0.30)	0.99	1357.6	20900.00
3	2611.38	22.99	1.835	0.30(0.30)	0.99	1548.7	20800.00
4	2624.13	24.90	1.739	0.30(0.30)	0.99	1673.3	20700.00
5	2652.40	32.65	1.473	0.30(0.30)	0.99	2180.6	20600.00
6	2619.56	38.43	1.356	0.30(0.30)	0.99	2518.7	20500.00
7	2583.89	40.83	1.312	0.30(0.30)	0.99	2620.0	20400.00
8	2579.24	41.26	1.306	0.30(0.30)	0.99	2633.5	20300.00
9	2541.91	43.94	1.265	0.30(0.30)	0.99	2712.2	20210.00
10	2541.54	44.00	1.264	0.30(0.30)	0.99	2714.6	20200.00
11	2519.08	45.75	1.238	0.30(0.30)	0.99	2770.7	20100.00
12	2455.81	50.47	1.167	0.30(0.30)	0.98	2915.1	13600.00
13	2176.64	87.53	0.891	0.30(0.29)	0.97	3910.8	13510.00
14	2039.48	96.95	0.851	0.30(0.29)	0.97	3976.6	13500.00

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2652.40  Tc(MIN.) =   32.65
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2180.61

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610210W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      142.38   17.22  0.30( 0.30) 1.00      82.7   21000.00
    TOTAL AREA(ACRES) =       82.7

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2535.08   19.99    1.987  0.30( 0.30) 0.99    1331.6   20810.00
      2     2546.14   20.33    1.969  0.30( 0.30) 0.99    1357.6   20900.00
      3     2611.38   22.99    1.835  0.30( 0.30) 0.99    1548.7   20800.00
      4     2624.13   24.90    1.739  0.30( 0.30) 0.99    1673.3   20700.00
      5     2652.40   32.65    1.473  0.30( 0.30) 0.99    2180.6   20600.00
      6     2619.56   38.43    1.356  0.30( 0.30) 0.99    2518.7   20500.00
      7     2583.89   40.83    1.312  0.30( 0.30) 0.99    2620.0   20400.00
      8     2579.24   41.26    1.306  0.30( 0.30) 0.99    2633.5   20300.00
      9     2541.91   43.94    1.265  0.30( 0.30) 0.99    2712.2   20210.00
     10     2541.54   44.00    1.264  0.30( 0.30) 0.99    2714.6   20200.00
     11     2519.08   45.75    1.238  0.30( 0.30) 0.99    2770.7   20100.00
     12     2455.81   50.47    1.167  0.30( 0.30) 0.98    2915.1   13600.00
     13     2176.64   87.53    0.891  0.30( 0.29) 0.97    3910.8   13510.00
     14     2039.48   96.95    0.851  0.30( 0.29) 0.97    3976.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      142.38   17.22    2.212  0.30( 0.30) 1.00      82.7   21000.00
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  13684.00 =    4160.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2618.30   17.22    2.212  0.30( 0.30) 0.99    1230.0   21000.00
```



```
      2     2660.65   19.99    1.987  0.30( 0.30) 0.99    1414.3   20810.00
      3     2670.43   20.33    1.969  0.30( 0.30) 0.99    1440.3   20900.00
      4     2725.68   22.99    1.835  0.30( 0.30) 0.99    1631.4   20800.00
      5     2731.26   24.90    1.739  0.30( 0.30) 0.99    1756.0   20700.00
      6     2739.71   32.65    1.473  0.30( 0.30) 0.99    2263.3   20600.00
      7     2698.22   38.43    1.356  0.30( 0.30) 0.99    2601.4   20500.00
      8     2659.27   40.83    1.312  0.30( 0.30) 0.99    2702.8   20400.00
      9     2654.12   41.26    1.306  0.30( 0.30) 0.99    2716.2   20300.00
     10     2613.77   43.94    1.265  0.30( 0.30) 0.99    2794.9   20210.00
     11     2613.33   44.00    1.264  0.30( 0.30) 0.99    2797.3   20200.00
     12     2588.88   45.75    1.238  0.30( 0.30) 0.99    2853.4   20100.00
     13     2520.36   50.47    1.167  0.30( 0.30) 0.99    2997.8   13600.00
     14     2220.63   87.53    0.891  0.30( 0.29) 0.98    3993.5   13510.00
     15     2080.51   96.95    0.851  0.30( 0.29) 0.97    4059.3   13500.00
   TOTAL AREA(ACRES) =      4059.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2739.71  Tc(MIN.) =   32.647
  EFFECTIVE AREA(ACRES) =   2263.32  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     4059.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13685.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    200.00  DOWNSTREAM(FEET) =    194.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   122.69   CHANNEL SLOPE =  0.0469
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.92
  CHANNEL FLOW THRU SUBAREA(CFS) =    2739.71
  FLOW VELOCITY(FEET/SEC.) =  16.71   FLOW DEPTH(FEET) =   3.92
  TRAVEL TIME(MIN.) =   0.12   Tc(MIN.) =   32.77
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13685.00 =   38984.01 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2618.30   17.35    2.202  0.30( 0.30) 0.99    1230.0   21000.00
      2     2660.65   20.11    1.980  0.30( 0.30) 0.99    1414.3   20810.00
      3     2670.43   20.45    1.963  0.30( 0.30) 0.99    1440.3   20900.00
      4     2725.68   23.11    1.829  0.30( 0.30) 0.99    1631.4   20800.00
      5     2731.26   25.02    1.733  0.30( 0.30) 0.99    1756.0   20700.00
      6     2739.71   32.77    1.470  0.30( 0.30) 0.99    2263.3   20600.00
      7     2698.22   38.56    1.354  0.30( 0.30) 0.99    2601.4   20500.00
      8     2659.27   40.95    1.311  0.30( 0.30) 0.99    2702.8   20400.00
      9     2654.12   41.39    1.304  0.30( 0.30) 0.99    2716.2   20300.00
     10     2613.77   44.06    1.263  0.30( 0.30) 0.99    2794.9   20210.00
     11     2613.33   44.13    1.262  0.30( 0.30) 0.99    2797.3   20200.00
     12     2588.88   45.88    1.236  0.30( 0.30) 0.99    2853.4   20100.00
     13     2520.36   50.59    1.165  0.30( 0.30) 0.99    2997.8   13600.00
     14     2220.63   87.66    0.890  0.30( 0.29) 0.98    3993.5   13510.00
     15     2080.51   97.08    0.851  0.30( 0.29) 0.97    4059.3   13500.00
  NEW PEAK FLOW DATA ARE:
```

```
  PEAK FLOW RATE(CFS) =    2739.71  Tc(MIN.) =   32.77
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2263.32

****************************************************************************
  FLOW PROCESS FROM NODE  13685.00 TO NODE  13410.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    194.24  DOWNSTREAM(FEET) =    178.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1843.57   CHANNEL SLOPE =  0.0084
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.21
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.402
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2743.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.09
  AVERAGE FLOW DEPTH(FEET) =   6.21   TRAVEL TIME(MIN.) =   3.38
  Tc(MIN.) =   36.15
  SUBAREA AREA(ACRES) =     8.39       SUBAREA RUNOFF(CFS) =    8.32
  EFFECTIVE AREA(ACRES) =   2271.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4067.7         PEAK FLOW RATE(CFS) =    2739.71
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.20   FLOW VELOCITY(FEET/SEC.) =   9.09
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13410.00 =   40827.58 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2618.30   20.77    1.947  0.30( 0.30) 0.99    1238.4   21000.00
      2     2660.65   23.52    1.809  0.30( 0.30) 0.99    1422.7   20810.00
      3     2670.43   23.85    1.792  0.30( 0.30) 0.99    1448.7   20900.00
      4     2725.68   26.50    1.672  0.30( 0.30) 0.99    1639.8   20800.00
      5     2731.26   28.41    1.592  0.30( 0.30) 0.99    1764.4   20700.00
      6     2739.71   36.15    1.402  0.30( 0.30) 0.99    2271.7   20600.00
      7     2698.22   41.95    1.295  0.30( 0.30) 0.99    2609.8   20500.00
      8     2659.27   44.36    1.259  0.30( 0.30) 0.99    2711.1   20400.00
      9     2654.12   44.80    1.252  0.30( 0.30) 0.99    2724.6   20300.00
     10     2613.77   47.49    1.211  0.30( 0.30) 0.99    2803.3   20210.00
     11     2613.33   47.55    1.210  0.30( 0.30) 0.99    2805.7   20200.00
     12     2588.88   49.31    1.183  0.30( 0.30) 0.99    2861.8   20100.00
     13     2520.36   54.05    1.122  0.30( 0.30) 0.99    3006.2   13600.00
     14     2220.63   91.25    0.872  0.30( 0.29) 0.98    4001.9   13510.00
     15     2080.51  100.74    0.837  0.30( 0.29) 0.97    4067.7   13500.00
  NEW PEAK FLOW DATA ARE:
```



```
  PEAK FLOW RATE(CFS) =    2739.71  Tc(MIN.) =   36.15
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2271.71
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     4067.7  TC(MIN.) =     36.15
  EFFECTIVE AREA(ACRES) =   2271.71  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.989
  PEAK FLOW RATE(CFS)   =    2739.71

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2618.30   20.77    1.947  0.30( 0.30) 0.99    1238.4   21000.00
      2     2660.65   23.52    1.809  0.30( 0.30) 0.99    1422.7   20810.00
      3     2670.43   23.85    1.792  0.30( 0.30) 0.99    1448.7   20900.00
      4     2725.68   26.50    1.672  0.30( 0.30) 0.99    1639.8   20800.00
      5     2731.26   28.41    1.592  0.30( 0.30) 0.99    1764.4   20700.00
      6     2739.71   36.15    1.402  0.30( 0.30) 0.99    2271.7   20600.00
      7     2698.22   41.95    1.295  0.30( 0.30) 0.99    2609.8   20500.00
      8     2659.27   44.36    1.259  0.30( 0.30) 0.99    2711.1   20400.00
      9     2654.12   44.80    1.252  0.30( 0.30) 0.99    2724.6   20300.00
     10     2613.77   47.49    1.211  0.30( 0.30) 0.99    2803.3   20210.00
     11     2613.33   47.55    1.210  0.30( 0.30) 0.99    2805.7   20200.00
     12     2588.88   49.31    1.183  0.30( 0.30) 0.99    2861.8   20100.00
     13     2520.36   54.05    1.122  0.30( 0.30) 0.99    3006.2   13600.00
     14     2220.63   91.25    0.872  0.30( 0.29) 0.98    4001.9   13510.00
     15     2080.51  100.74    0.837  0.30( 0.29) 0.97    4067.7   13500.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S37.DAT
  TIME/DATE OF STUDY: 09:36 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.753
   2)   10.00;  3.112
   3)   15.00;  2.390
   4)   20.00;  1.984
   5)   25.00;  1.732
   6)   30.00;  1.524
   7)   40.00;  1.323
   8)   50.00;  1.171
   9)   60.00;  1.045
  10)   90.00;  0.875
  11)  120.00;  0.763
  12)  180.00;  0.634
  13)  360.00;  0.464
  14) 1200.00;  0.203
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S34.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    25181.34   18.20  0.30( 0.29) 0.98    4784.9   21100.00
      2    28116.14   28.80  0.30( 0.29) 0.98    8341.6   20700.00
      3    30301.89   37.45  0.30( 0.29) 0.98   11656.4   10100.00
      4    32195.80   45.18  0.30( 0.29) 0.98   15300.2   20300.00
      5    34133.10   57.85  0.30( 0.29) 0.97   21559.5   31400.00
      6    35412.41   68.89  0.30( 0.29) 0.97   27047.2   13100.00
      7    36359.79   75.49  0.30( 0.29) 0.97   29919.9   11801.00
      8    38131.02   86.08  0.30( 0.29) 0.97   35237.8   11530.00
      9    38788.81   91.60  0.30( 0.29) 0.97   38732.2   13510.00
     10    40534.53  104.57  0.30( 0.29) 0.97   46874.3   11350.00
     11    40894.39  109.25  0.30( 0.29) 0.97   50047.4   11130.00
     12    40448.74  115.33  0.30( 0.29) 0.98   52974.5   12300.00
     13    39621.58  124.11  0.30( 0.29) 0.98   57235.1   12400.00
     14    38533.20  133.64  0.30( 0.29) 0.98   60636.6   12201.00
     15    37535.12  141.13  0.30( 0.29) 0.98   62529.1   12231.00
     16    36499.61  148.62  0.30( 0.29) 0.98   64083.2   10400.00
     17    34904.61  158.07  0.30( 0.29) 0.98   65528.4   12010.00
     18    33849.50  163.47  0.30( 0.29) 0.98   65792.0   10210.00
     19    33177.68  167.47  0.30( 0.29) 0.98   65937.1   12000.00
     20    29384.68  193.95  0.30( 0.29) 0.98   66551.6   10100.00
   TOTAL AREA(ACRES) =    66551.6

**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    25181.34   18.20  0.30( 0.29) 0.98    4784.9   21100.00
      2    28116.14   28.80  0.30( 0.29) 0.98    8341.6   20700.00
      3    30301.89   37.45  0.30( 0.29) 0.98   11656.4   10100.00
      4    32195.80   45.18  0.30( 0.29) 0.98   15300.2   20300.00
      5    34133.10   57.85  0.30( 0.29) 0.97   21559.5   31400.00
      6    35412.41   68.89  0.30( 0.29) 0.97   27047.2   13100.00
      7    36359.79   75.49  0.30( 0.29) 0.97   29919.9   11801.00
      8    38131.02   86.08  0.30( 0.29) 0.97   35237.8   11530.00
      9    38788.81   91.60  0.30( 0.29) 0.97   38732.2   13510.00
     10    40534.53  104.57  0.30( 0.29) 0.97   46874.3   11350.00
     11    40894.39  109.25  0.30( 0.29) 0.97   50047.4   11130.00
     12    40448.74  115.33  0.30( 0.29) 0.98   52974.5   12300.00
     13    39621.58  124.11  0.30( 0.29) 0.98   57235.1   12400.00
     14    38533.20  133.64  0.30( 0.29) 0.98   60636.6   12201.00
     15    37535.12  141.13  0.30( 0.29) 0.98   62529.1   12231.00
     16    36499.61  148.62  0.30( 0.29) 0.98   64083.2   10400.00
     17    34904.61  158.07  0.30( 0.29) 0.98   65528.4   12010.00
     18    33849.50  163.47  0.30( 0.29) 0.98   65792.0   10210.00
```

```
    19    33177.68  167.47  0.30( 0.29) 0.98   65937.1   12000.00
    20    29384.68  193.95  0.30( 0.29) 0.98   66551.6   10100.00
   TOTAL AREA(ACRES) =     66551.6

****************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13701.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    167.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.11   CHANNEL SLOPE =  0.0015
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.11
  CHANNEL FLOW THRU SUBAREA(CFS) =   40894.39
  FLOW VELOCITY(FEET/SEC.) =   9.82   FLOW DEPTH(FEET) =  15.11
  TRAVEL TIME(MIN.) =   2.88   Tc(MIN.) =  112.14
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25181.34   21.56    1.906  0.30( 0.29) 0.98    4784.9   21100.00
      2    28116.14   32.04    1.483  0.30( 0.29) 0.98    8341.6   20700.00
      3    30301.89   40.61    1.314  0.30( 0.29) 0.98   11656.4   10100.00
      4    32195.80   48.28    1.197  0.30( 0.29) 0.98   15300.2   20300.00
      5    34133.10   60.89    1.040  0.30( 0.29) 0.97   21559.5   31400.00
      6    35412.41   71.91    0.978  0.30( 0.29) 0.97   27047.2   13100.00
      7    36359.79   78.48    0.940  0.30( 0.29) 0.97   29919.9   11801.00
      8    38131.02   89.03    0.881  0.30( 0.29) 0.97   35237.8   11530.00
      9    38788.81   94.53    0.858  0.30( 0.29) 0.97   38732.2   13510.00
     10    40534.53  107.46    0.810  0.30( 0.29) 0.97   46874.3   11350.00
     11    40894.39  112.14    0.792  0.30( 0.29) 0.97   50047.4   11130.00
     12    40448.74  118.23    0.770  0.30( 0.29) 0.98   52974.5   12300.00
     13    39621.58  127.02    0.748  0.30( 0.29) 0.98   57235.1   12400.00
     14    38533.20  136.57    0.727  0.30( 0.29) 0.98   60636.6   12201.00
     15    37535.12  144.09    0.711  0.30( 0.29) 0.98   62529.1   12231.00
     16    36499.61  151.61    0.695  0.30( 0.29) 0.98   64083.2   10400.00
     17    34904.61  161.10    0.675  0.30( 0.29) 0.98   65528.4   12010.00
     18    33849.50  166.53    0.663  0.30( 0.29) 0.98   65792.0   10210.00
     19    33177.68  170.55    0.654  0.30( 0.29) 0.98   65937.1   12000.00
     20    29384.68  197.14    0.618  0.30( 0.29) 0.98   66551.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   40894.39  Tc(MIN.) =  112.14
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   50047.37

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
```



```
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509102W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     232.79   23.57  0.30( 0.26) 0.87     167.7   10200.00
    TOTAL AREA(ACRES) =      167.7

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25181.34   21.56    1.906  0.30( 0.29) 0.98    4784.9   21100.00
      2    28116.14   32.04    1.483  0.30( 0.29) 0.98    8341.6   20700.00
      3    30301.89   40.61    1.314  0.30( 0.29) 0.98   11656.4   10100.00
      4    32195.80   48.28    1.197  0.30( 0.29) 0.98   15300.2   20300.00
      5    34133.10   60.89    1.040  0.30( 0.29) 0.97   21559.5   31400.00
      6    35412.41   71.91    0.978  0.30( 0.29) 0.97   27047.2   13100.00
      7    36359.79   78.48    0.940  0.30( 0.29) 0.97   29919.9   11801.00
      8    38131.02   89.03    0.881  0.30( 0.29) 0.97   35237.8   11530.00
      9    38788.81   94.53    0.858  0.30( 0.29) 0.97   38732.2   13510.00
     10    40534.53  107.46    0.810  0.30( 0.29) 0.97   46874.3   11350.00
     11    40894.39  112.14    0.792  0.30( 0.29) 0.97   50047.4   11130.00
     12    40448.74  118.23    0.770  0.30( 0.29) 0.98   52974.5   12300.00
     13    39621.58  127.02    0.748  0.30( 0.29) 0.98   57235.1   12400.00
     14    38533.20  136.57    0.727  0.30( 0.29) 0.98   60636.6   12201.00
     15    37535.12  144.09    0.711  0.30( 0.29) 0.98   62529.1   12231.00
     16    36499.61  151.61    0.695  0.30( 0.29) 0.98   64083.2   10400.00
     17    34904.61  161.10    0.675  0.30( 0.29) 0.98   65528.4   12010.00
     18    33849.50  166.53    0.663  0.30( 0.29) 0.98   65792.0   10210.00
     19    33177.68  170.55    0.654  0.30( 0.29) 0.98   65937.1   12000.00
     20    29384.68  197.14    0.618  0.30( 0.29) 0.98   66551.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     232.79   23.57    1.804  0.30( 0.26) 0.87     167.7   10200.00
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  13701.00 =    9099.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25408.26   21.56    1.906  0.30( 0.29) 0.98    4938.3   21100.00
      2    25976.74   23.57    1.804  0.30( 0.29) 0.98    5634.4   10200.00
      3    28300.45   32.04    1.483  0.30( 0.29) 0.98    8509.3   20700.00
      4    30460.66   40.61    1.314  0.30( 0.29) 0.98   11824.0   10100.00
      5    32336.98   48.28    1.197  0.30( 0.29) 0.97   15467.8   20300.00
      6    34250.55   60.89    1.040  0.30( 0.29) 0.97   21727.1   31400.00
      7    35520.45   71.91    0.978  0.30( 0.29) 0.97   27214.8   13100.00
      8    36462.21   78.48    0.940  0.30( 0.29) 0.97   30087.5   11801.00
      9    38224.42   89.03    0.881  0.30( 0.29) 0.97   35405.4   11530.00
     10    38878.83   94.53    0.858  0.30( 0.29) 0.97   38899.9   13510.00
```

```
    11    40617.26  107.46    0.810  0.30( 0.29) 0.97   47041.9   11350.00
    12    40974.48  112.14    0.792  0.30( 0.29) 0.97   50215.0   11130.00
    13    40525.41  118.23    0.770  0.30( 0.29) 0.97   53142.2   12300.00
    14    39694.97  127.02    0.748  0.30( 0.29) 0.98   57402.8   12400.00
    15    38603.49  136.57    0.727  0.30( 0.29) 0.98   60804.2   12201.00
    16    37602.98  144.09    0.711  0.30( 0.29) 0.98   62696.8   12231.00
    17    36565.02  151.61    0.695  0.30( 0.29) 0.98   64250.8   10400.00
    18    34966.95  161.10    0.675  0.30( 0.29) 0.98   65696.1   12010.00
    19    33910.08  166.53    0.663  0.30( 0.29) 0.98   65959.7   10210.00
    20    33236.95  170.55    0.654  0.30( 0.29) 0.98   66104.8   12000.00
    21    29438.44  197.14    0.618  0.30( 0.29) 0.98   66719.3   10100.00
  TOTAL AREA(ACRES) =     66719.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    40974.48  Tc(MIN.) =  112.137
 EFFECTIVE AREA(ACRES) =  50215.04  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    66719.3
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13701.00 TO NODE  13720.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    165.51
 CHANNEL LENGTH THRU SUBAREA(FEET) =   192.72   CHANNEL SLOPE =  0.0103
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.79
 CHANNEL FLOW THRU SUBAREA(CFS) =   40974.48
 FLOW VELOCITY(FEET/SEC.) =  19.12   FLOW DEPTH(FEET) =   8.79
 TRAVEL TIME(MIN.) =   0.17   Tc(MIN.) =  112.30
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13720.00 =  126443.80 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    25408.26   21.75    1.896  0.30( 0.29) 0.98    4938.3   21100.00
     2    25976.74   23.76    1.794  0.30( 0.29) 0.98    5634.4   10200.00
     3    28300.45   32.23    1.479  0.30( 0.29) 0.98    8509.3   20700.00
     4    30460.66   40.79    1.311  0.30( 0.29) 0.98   11824.0   10100.00
     5    32336.98   48.46    1.194  0.30( 0.29) 0.97   15467.8   20300.00
     6    34250.55   61.07    1.039  0.30( 0.29) 0.97   21727.1   31400.00
     7    35520.45   72.08    0.977  0.30( 0.29) 0.97   27214.8   13100.00
     8    36462.21   78.65    0.939  0.30( 0.29) 0.97   30087.5   11801.00
     9    38224.42   89.20    0.880  0.30( 0.29) 0.97   35405.4   11530.00
    10    38878.83   94.70    0.857  0.30( 0.29) 0.97   38899.9   13510.00
    11    40617.26  107.62    0.809  0.30( 0.29) 0.97   47041.9   11350.00
    12    40974.48  112.30    0.792  0.30( 0.29) 0.97   50215.0   11130.00
    13    40525.41  118.39    0.769  0.30( 0.29) 0.97   53142.2   12300.00
    14    39694.97  127.19    0.748  0.30( 0.29) 0.98   57402.8   12400.00
    15    38603.49  136.75    0.727  0.30( 0.29) 0.98   60804.2   12201.00
    16    37602.98  144.26    0.711  0.30( 0.29) 0.98   62696.8   12231.00
    17    36565.02  151.78    0.695  0.30( 0.29) 0.98   64250.8   10400.00
    18    34966.95  161.27    0.674  0.30( 0.29) 0.98   65696.1   12010.00
    19    33910.08  166.71    0.663  0.30( 0.29) 0.98   65959.7   10210.00
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    20    33236.95  170.73    0.654  0.30( 0.29) 0.98   66104.8   12000.00
    21    29438.44  197.33    0.618  0.30( 0.29) 0.98   66719.3   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =   40974.48  Tc(MIN.) =  112.30
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   50215.04

****************************************************************************
 FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    165.51  DOWNSTREAM(FEET) =    161.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2042.40   CHANNEL SLOPE =  0.0019
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  14.10
 CHANNEL FLOW THRU SUBAREA(CFS) =   40974.48
 FLOW VELOCITY(FEET/SEC.) =  10.74   FLOW DEPTH(FEET) =  14.10
 TRAVEL TIME(MIN.) =   3.17   Tc(MIN.) =  115.47
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    25408.26   25.43    1.714  0.30( 0.29) 0.98    4938.3   21100.00
     2    25976.74   27.42    1.631  0.30( 0.29) 0.98    5634.4   10200.00
     3    28300.45   35.79    1.408  0.30( 0.29) 0.98    8509.3   20700.00
     4    30460.66   44.27    1.258  0.30( 0.29) 0.98   11824.0   10100.00
     5    32336.98   51.87    1.147  0.30( 0.29) 0.97   15467.8   20300.00
     6    34250.55   64.42    1.020  0.30( 0.29) 0.97   21727.1   31400.00
     7    35520.45   75.39    0.958  0.30( 0.29) 0.97   27214.8   13100.00
     8    36462.21   81.94    0.921  0.30( 0.29) 0.97   30087.5   11801.00
     9    38224.42   92.44    0.866  0.30( 0.29) 0.97   35405.4   11530.00
    10    38878.83   97.92    0.845  0.30( 0.29) 0.97   38899.9   13510.00
    11    40617.26  110.80    0.797  0.30( 0.29) 0.97   47041.9   11350.00
    12    40974.48  115.47    0.780  0.30( 0.29) 0.97   50215.0   11130.00
    13    40525.41  121.57    0.760  0.30( 0.29) 0.97   53142.2   12300.00
    14    39694.97  130.39    0.741  0.30( 0.29) 0.98   57402.8   12400.00
    15    38603.49  139.97    0.720  0.30( 0.29) 0.98   60804.2   12201.00
    16    37602.98  147.51    0.704  0.30( 0.29) 0.98   62696.8   12231.00
    17    36565.02  155.07    0.688  0.30( 0.29) 0.98   64250.8   10400.00
    18    34966.95  164.60    0.667  0.30( 0.29) 0.98   65696.1   12010.00
    19    33910.08  170.07    0.655  0.30( 0.29) 0.98   65959.7   10210.00
    20    33236.95  174.11    0.647  0.30( 0.29) 0.98   66104.8   12000.00
    21    29438.44  200.84    0.614  0.30( 0.29) 0.98   66719.3   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =   40974.48  Tc(MIN.) =  115.47
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   50215.04

****************************************************************************
 FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
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****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509103W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      673.42   22.44  0.30( 0.28) 0.95     474.8   10300.00
    TOTAL AREA(ACRES) =      474.8

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25408.26   25.43    1.714  0.30( 0.29) 0.98    4938.3   21100.00
      2    25976.74   27.42    1.631  0.30( 0.29) 0.98    5634.4   10200.00
      3    28300.45   35.79    1.408  0.30( 0.29) 0.98    8509.3   20700.00
      4    30460.66   44.27    1.258  0.30( 0.29) 0.98   11824.0   10100.00
      5    32336.98   51.87    1.147  0.30( 0.29) 0.97   15467.8   20300.00
      6    34250.55   64.42    1.020  0.30( 0.29) 0.97   21727.1   31400.00
      7    35520.45   75.39    0.958  0.30( 0.29) 0.97   27214.8   13100.00
      8    36462.21   81.94    0.921  0.30( 0.29) 0.97   30087.5   11801.00
      9    38224.42   92.44    0.866  0.30( 0.29) 0.97   35405.4   11530.00
     10    38878.83   97.92    0.845  0.30( 0.29) 0.97   38899.9   13510.00
     11    40617.26  110.80    0.797  0.30( 0.29) 0.97   47041.9   11350.00
     12    40974.48  115.47    0.780  0.30( 0.29) 0.97   50215.0   11130.00
     13    40525.41  121.57    0.760  0.30( 0.29) 0.97   53142.2   12300.00
     14    39694.97  130.39    0.741  0.30( 0.29) 0.98   57402.8   12400.00
     15    38603.49  139.97    0.720  0.30( 0.29) 0.98   60804.2   12201.00
     16    37602.98  147.51    0.704  0.30( 0.29) 0.98   62696.8   12231.00
     17    36565.02  155.07    0.688  0.30( 0.29) 0.98   64250.8   10400.00
     18    34966.95  164.60    0.667  0.30( 0.29) 0.98   65696.1   12010.00
     19    33910.08  170.07    0.655  0.30( 0.29) 0.98   65959.7   10210.00
     20    33236.95  174.11    0.647  0.30( 0.29) 0.98   66104.8   12000.00
     21    29438.44  200.84    0.614  0.30( 0.29) 0.98   66719.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      673.42   22.44    1.861  0.30( 0.28) 0.95     474.8   10300.00
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  13740.00 =    8072.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25411.73   22.44    1.861  0.30( 0.29) 0.97    4831.9   10300.00
      2    26018.87   25.43    1.714  0.30( 0.29) 0.97    5413.0   21100.00
      3    26552.10   27.42    1.631  0.30( 0.29) 0.98    6109.1   10200.00
      4    28780.21   35.79    1.408  0.30( 0.29) 0.98    8984.0   20700.00
      5    30876.53   44.27    1.258  0.30( 0.29) 0.98   12298.8   10100.00
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      6    32705.55   51.87    1.147  0.30( 0.29) 0.97   15942.6   20300.00
      7    34564.68   64.42    1.020  0.30( 0.29) 0.97   22201.9   31400.00
      8    35808.00   75.39    0.958  0.30( 0.29) 0.97   27689.6   13100.00
      9    36733.93   81.94    0.921  0.30( 0.29) 0.97   30562.3   11801.00
     10    38472.73   92.44    0.866  0.30( 0.29) 0.97   35880.2   11530.00
     11    39118.38   97.92    0.845  0.30( 0.29) 0.97   39374.6   13510.00
     12    40836.28  110.80    0.797  0.30( 0.29) 0.97   47516.7   11350.00
     13    41186.05  115.47    0.780  0.30( 0.29) 0.97   50689.8   11130.00
     14    40728.30  121.57    0.760  0.30( 0.29) 0.97   53616.9   12300.00
     15    39889.77  130.39    0.741  0.30( 0.29) 0.98   57877.5   12400.00
     16    38789.49  139.97    0.720  0.30( 0.29) 0.98   61279.0   12201.00
     17    37782.05  147.51    0.704  0.30( 0.29) 0.98   63171.6   12231.00
     18    36737.15  155.07    0.688  0.30( 0.29) 0.98   64725.6   10400.00
     19    35130.32  164.60    0.667  0.30( 0.29) 0.98   66170.8   12010.00
     20    34068.43  170.07    0.655  0.30( 0.29) 0.98   66434.4   10210.00
     21    33391.59  174.11    0.647  0.30( 0.29) 0.98   66579.5   12000.00
     22    29579.26  200.84    0.614  0.30( 0.29) 0.98   67194.1   10100.00
    TOTAL AREA(ACRES) =     67194.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    41186.05  Tc(MIN.) =  115.474
  EFFECTIVE AREA(ACRES) =  50689.80  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67194.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13741.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    161.63  DOWNSTREAM(FEET) =    141.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   389.20   CHANNEL SLOPE =  0.0530
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.98
  CHANNEL FLOW THRU SUBAREA(CFS) =   41186.05
  FLOW VELOCITY(FEET/SEC.) =  39.10   FLOW DEPTH(FEET) =   7.98
  TRAVEL TIME(MIN.) =   0.17   Tc(MIN.) =  115.64
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13741.00 =  128875.40 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25411.73   22.64    1.851  0.30( 0.29) 0.97    4831.9   10300.00
      2    26018.87   25.63    1.706  0.30( 0.29) 0.97    5413.0   21100.00
      3    26552.10   27.61    1.623  0.30( 0.29) 0.98    6109.1   10200.00
      4    28780.21   35.97    1.404  0.30( 0.29) 0.98    8984.0   20700.00
      5    30876.53   44.45    1.255  0.30( 0.29) 0.98   12298.8   10100.00
      6    32705.55   52.05    1.145  0.30( 0.29) 0.97   15942.6   20300.00
      7    34564.68   64.60    1.019  0.30( 0.29) 0.97   22201.9   31400.00
      8    35808.00   75.57    0.957  0.30( 0.29) 0.97   27689.6   13100.00
      9    36733.93   82.11    0.920  0.30( 0.29) 0.97   30562.3   11801.00
     10    38472.73   92.61    0.865  0.30( 0.29) 0.97   35880.2   11530.00
     11    39118.38   98.09    0.845  0.30( 0.29) 0.97   39374.6   13510.00
     12    40836.28  110.97    0.797  0.30( 0.29) 0.97   47516.7   11350.00
     13    41186.05  115.64    0.779  0.30( 0.29) 0.97   50689.8   11130.00
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    14    40728.30  121.74    0.759  0.30( 0.29) 0.97   53616.9   12300.00
    15    39889.77  130.56    0.740  0.30( 0.29) 0.98   57877.5   12400.00
    16    38789.49  140.14    0.720  0.30( 0.29) 0.98   61279.0   12201.00
    17    37782.05  147.69    0.703  0.30( 0.29) 0.98   63171.6   12231.00
    18    36737.15  155.24    0.687  0.30( 0.29) 0.98   64725.6   10400.00
    19    35130.32  164.78    0.667  0.30( 0.29) 0.98   66170.8   12010.00
    20    34068.43  170.24    0.655  0.30( 0.29) 0.98   66434.4   10210.00
    21    33391.59  174.29    0.646  0.30( 0.29) 0.98   66579.5   12000.00
    22    29579.26  201.03    0.614  0.30( 0.29) 0.98   67194.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41186.05  Tc(MIN.) =  115.64
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   50689.80

****************************************************************************
  FLOW PROCESS FROM NODE  13741.00 TO NODE  13802.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    141.00  DOWNSTREAM(FEET) =    135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1533.41   CHANNEL SLOPE =  0.0039
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.04
  CHANNEL FLOW THRU SUBAREA(CFS) =   41186.05
  FLOW VELOCITY(FEET/SEC.) =  15.64   FLOW DEPTH(FEET) =  16.04
  TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =  117.27
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25411.73   24.51    1.757  0.30( 0.29) 0.97    4831.9   10300.00
      2    26018.87   27.49    1.628  0.30( 0.29) 0.97    5413.0   21100.00
      3    26552.10   29.46    1.546  0.30( 0.29) 0.98    6109.1   10200.00
      4    28780.21   37.79    1.368  0.30( 0.29) 0.98    8984.0   20700.00
      5    30876.53   46.23    1.228  0.30( 0.29) 0.98   12298.8   10100.00
      6    32705.55   53.80    1.123  0.30( 0.29) 0.97   15942.6   20300.00
      7    34564.68   66.31    1.009  0.30( 0.29) 0.97   22201.9   31400.00
      8    35808.00   77.27    0.947  0.30( 0.29) 0.97   27689.6   13100.00
      9    36733.93   83.80    0.910  0.30( 0.29) 0.97   30562.3   11801.00
     10    38472.73   94.27    0.859  0.30( 0.29) 0.97   35880.2   11530.00
     11    39118.38   99.75    0.839  0.30( 0.29) 0.97   39374.6   13510.00
     12    40836.28  112.61    0.791  0.30( 0.29) 0.97   47516.7   11350.00
     13    41186.05  117.27    0.773  0.30( 0.29) 0.97   50689.8   11130.00
     14    40728.30  123.38    0.756  0.30( 0.29) 0.97   53616.9   12300.00
     15    39889.77  132.21    0.737  0.30( 0.29) 0.98   57877.5   12400.00
     16    38789.49  141.80    0.716  0.30( 0.29) 0.98   61279.0   12201.00
     17    37782.05  149.36    0.700  0.30( 0.29) 0.98   63171.6   12231.00
     18    36737.15  156.93    0.684  0.30( 0.29) 0.98   64725.6   10400.00
     19    35130.32  166.49    0.663  0.30( 0.29) 0.98   66170.8   12010.00
     20    34068.43  171.97    0.651  0.30( 0.29) 0.98   66434.4   10210.00
     21    33391.59  176.02    0.643  0.30( 0.29) 0.98   66579.5   12000.00
     22    29579.26  202.82    0.612  0.30( 0.29) 0.98   67194.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41186.05  Tc(MIN.) =  117.27
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
```



```
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   50689.80

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509104W.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      659.43   31.05  0.30( 0.28) 0.94     599.8   10400.00
    TOTAL AREA(ACRES) =      599.8

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25411.73   24.51    1.757  0.30( 0.29) 0.97    4831.9   10300.00
      2    26018.87   27.49    1.628  0.30( 0.29) 0.97    5413.0   21100.00
      3    26552.10   29.46    1.546  0.30( 0.29) 0.98    6109.1   10200.00
      4    28780.21   37.79    1.368  0.30( 0.29) 0.98    8984.0   20700.00
      5    30876.53   46.23    1.228  0.30( 0.29) 0.98   12298.8   10100.00
      6    32705.55   53.80    1.123  0.30( 0.29) 0.97   15942.6   20300.00
      7    34564.68   66.31    1.009  0.30( 0.29) 0.97   22201.9   31400.00
      8    35808.00   77.27    0.947  0.30( 0.29) 0.97   27689.6   13100.00
      9    36733.93   83.80    0.910  0.30( 0.29) 0.97   30562.3   11801.00
     10    38472.73   94.27    0.859  0.30( 0.29) 0.97   35880.2   11530.00
     11    39118.38   99.75    0.839  0.30( 0.29) 0.97   39374.6   13510.00
     12    40836.28  112.61    0.791  0.30( 0.29) 0.97   47516.7   11350.00
     13    41186.05  117.27    0.773  0.30( 0.29) 0.97   50689.8   11130.00
     14    40728.30  123.38    0.756  0.30( 0.29) 0.97   53616.9   12300.00
     15    39889.77  132.21    0.737  0.30( 0.29) 0.98   57877.5   12400.00
     16    38789.49  141.80    0.716  0.30( 0.29) 0.98   61279.0   12201.00
     17    37782.05  149.36    0.700  0.30( 0.29) 0.98   63171.6   12231.00
     18    36737.15  156.93    0.684  0.30( 0.29) 0.98   64725.6   10400.00
     19    35130.32  166.49    0.663  0.30( 0.29) 0.98   66170.8   12010.00
     20    34068.43  171.97    0.651  0.30( 0.29) 0.98   66434.4   10210.00
     21    33391.59  176.02    0.643  0.30( 0.29) 0.98   66579.5   12000.00
     22    29579.26  202.82    0.612  0.30( 0.29) 0.98   67194.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      659.43   31.05    1.503  0.30( 0.28) 0.94     599.8   10400.00
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  13802.00 =   12273.00 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26040.46	24.51	1.757	0.30(0.29)	0.97	5305.5	10300.00
2	26662.71	27.49	1.628	0.30(0.29)	0.97	5944.1	21100.00
3	27200.10	29.46	1.546	0.30(0.29)	0.97	6678.3	10200.00
4	27636.09	31.05	1.503	0.30(0.29)	0.97	7256.7	10400.00
5	29366.53	37.79	1.368	0.30(0.29)	0.97	9583.8	20700.00
6	31387.72	46.23	1.228	0.30(0.29)	0.97	12898.6	10100.00
7	33159.96	53.80	1.123	0.30(0.29)	0.97	16542.4	20300.00
8	34957.56	66.31	1.009	0.30(0.29)	0.97	22801.7	31400.00
9	36167.37	77.27	0.947	0.30(0.29)	0.97	28289.4	13100.00
10	37073.34	83.80	0.910	0.30(0.29)	0.97	31162.1	11801.00
11	38784.54	94.27	0.859	0.30(0.29)	0.97	36480.0	11530.00
12	39419.15	99.75	0.839	0.30(0.29)	0.97	39974.4	13510.00
13	41111.13	112.61	0.791	0.30(0.29)	0.97	48116.5	11350.00
14	41451.50	117.27	0.773	0.30(0.29)	0.97	51289.6	11130.00
15	40984.34	123.38	0.756	0.30(0.29)	0.97	54216.7	12300.00
16	40135.55	132.21	0.737	0.30(0.29)	0.98	58477.3	12400.00
17	39024.14	141.80	0.716	0.30(0.29)	0.98	61878.8	12201.00
18	38007.93	149.36	0.700	0.30(0.29)	0.98	63771.3	12231.00
19	36954.24	156.93	0.684	0.30(0.29)	0.98	65325.4	10400.00
20	35336.32	166.49	0.663	0.30(0.29)	0.98	66770.6	12010.00
21	34268.07	171.97	0.651	0.30(0.29)	0.98	67034.2	10210.00
22	33586.52	176.02	0.643	0.30(0.29)	0.98	67179.3	12000.00
23	29757.93	202.82	0.612	0.30(0.29)	0.98	67793.9	10100.00

TOTAL AREA(ACRES) = 67793.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 41451.50 Tc(MIN.) = 117.274
EFFECTIVE AREA(ACRES) = 51289.57 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 67793.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

****
FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 135.00 DOWNSTREAM(FEET) = 133.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 207.23 CHANNEL SLOPE = 0.0097
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.71
CHANNEL FLOW THRU SUBAREA(CFS) = 41451.50
FLOW VELOCITY(FEET/SEC.) = 21.61 FLOW DEPTH(FEET) = 12.71
TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 117.43
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13803.00 = 130616.03 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26040.46	24.70	1.747	0.30(0.29)	0.97	5305.5	10300.00
2	26662.71	27.67	1.621	0.30(0.29)	0.97	5944.1	21100.00
3	27200.10	29.64	1.539	0.30(0.29)	0.97	6678.3	10200.00

4	27636.09	31.23	1.499	0.30(0.29)	0.97	7256.7	10400.00
5	29366.53	37.96	1.364	0.30(0.29)	0.97	9583.8	20700.00
6	31387.72	46.40	1.226	0.30(0.29)	0.97	12898.6	10100.00
7	33159.96	53.97	1.121	0.30(0.29)	0.97	16542.4	20300.00
8	34957.56	66.48	1.008	0.30(0.29)	0.97	22801.7	31400.00
9	36167.37	77.43	0.946	0.30(0.29)	0.97	28289.4	13100.00
10	37073.34	83.96	0.909	0.30(0.29)	0.97	31162.1	11801.00
11	38784.54	94.44	0.858	0.30(0.29)	0.97	36480.0	11530.00
12	39419.15	99.91	0.838	0.30(0.29)	0.97	39974.4	13510.00
13	41111.13	112.77	0.790	0.30(0.29)	0.97	48116.5	11350.00
14	41451.50	117.43	0.773	0.30(0.29)	0.97	51289.6	11130.00
15	40984.34	123.54	0.755	0.30(0.29)	0.97	54216.7	12300.00
16	40135.55	132.37	0.736	0.30(0.29)	0.98	58477.3	12400.00
17	39024.14	141.97	0.716	0.30(0.29)	0.98	61878.8	12201.00
18	38007.93	149.52	0.700	0.30(0.29)	0.98	63771.3	12231.00
19	36954.24	157.09	0.683	0.30(0.29)	0.98	65325.4	10400.00
20	35336.32	166.65	0.663	0.30(0.29)	0.98	66770.6	12010.00
21	34268.07	172.14	0.651	0.30(0.29)	0.98	67034.2	10210.00
22	33586.52	176.19	0.642	0.30(0.29)	0.98	67179.3	12000.00
23	29757.93	203.00	0.612	0.30(0.29)	0.98	67793.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 41451.50 Tc(MIN.) = 117.43
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 51289.57

****
FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========
==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 67793.9 TC(MIN.) = 117.43
EFFECTIVE AREA(ACRES) = 51289.57 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.973
PEAK FLOW RATE(CFS) = 41451.50

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26040.46	24.70	1.747	0.30(0.29)	0.97	5305.5	10300.00
2	26662.71	27.67	1.621	0.30(0.29)	0.97	5944.1	21100.00
3	27200.10	29.64	1.539	0.30(0.29)	0.97	6678.3	10200.00
4	27636.09	31.23	1.499	0.30(0.29)	0.97	7256.7	10400.00
5	29366.53	37.96	1.364	0.30(0.29)	0.97	9583.8	20700.00
6	31387.72	46.40	1.226	0.30(0.29)	0.97	12898.6	10100.00
7	33159.96	53.97	1.121	0.30(0.29)	0.97	16542.4	20300.00
8	34957.56	66.48	1.008	0.30(0.29)	0.97	22801.7	31400.00
9	36167.37	77.43	0.946	0.30(0.29)	0.97	28289.4	13100.00
10	37073.34	83.96	0.909	0.30(0.29)	0.97	31162.1	11801.00
11	38784.54	94.44	0.858	0.30(0.29)	0.97	36480.0	11530.00
12	39419.15	99.91	0.838	0.30(0.29)	0.97	39974.4	13510.00
13	41111.13	112.77	0.790	0.30(0.29)	0.97	48116.5	11350.00
14	41451.50	117.43	0.773	0.30(0.29)	0.97	51289.6	11130.00
15	40984.34	123.54	0.755	0.30(0.29)	0.97	54216.7	12300.00
16	40135.55	132.37	0.736	0.30(0.29)	0.98	58477.3	12400.00
17	39024.14	141.97	0.716	0.30(0.29)	0.98	61878.8	12201.00
18	38007.93	149.52	0.700	0.30(0.29)	0.98	63771.3	12231.00

19	36954.24	157.09	0.683	0.30(0.29)	0.98	65325.4	10400.00
20	35336.32	166.65	0.663	0.30(0.29)	0.98	66770.6	12010.00
21	34268.07	172.14	0.651	0.30(0.29)	0.98	67034.2	10210.00
22	33586.52	176.19	0.642	0.30(0.29)	0.98	67179.3	12000.00
23	29757.93	203.00	0.612	0.30(0.29)	0.98	67793.9	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S38.DAT
  TIME/DATE OF STUDY: 09:38 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.740
   2)   10.00;  3.104
   3)   15.00;  2.386
   4)   20.00;  1.981
   5)   25.00;  1.730
   6)   30.00;  1.523
   7)   40.00;  1.321
   8)   50.00;  1.169
   9)   60.00;  1.043
  10)   90.00;  0.873
  11)  120.00;  0.761
  12)  180.00;  0.632
  13)  360.00;  0.462
  14) 1440.00;  0.202
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S37.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    26040.46   24.70  0.30( 0.29) 0.97    5305.5   10300.00
      2    27636.09   31.23  0.30( 0.29) 0.97    7256.7   10400.00
      3    29366.53   37.96  0.30( 0.29) 0.97    9583.8   20700.00
      4    31387.72   46.40  0.30( 0.29) 0.97   12898.6   10100.00
      5    33159.96   53.97  0.30( 0.29) 0.97   16542.4   20300.00
      6    34957.56   66.48  0.30( 0.29) 0.97   22801.7   31400.00
      7    36167.37   77.43  0.30( 0.29) 0.97   28289.4   13100.00
      8    37073.34   83.96  0.30( 0.29) 0.97   31162.1   11801.00
      9    38784.54   94.44  0.30( 0.29) 0.97   36480.0   11530.00
     10    39419.15   99.91  0.30( 0.29) 0.97   39974.4   13510.00
     11    41111.13  112.77  0.30( 0.29) 0.97   48116.5   11350.00
     12    41451.50  117.43  0.30( 0.29) 0.97   51289.6   11130.00
     13    40984.34  123.54  0.30( 0.29) 0.97   54216.7   12300.00
     14    40135.55  132.37  0.30( 0.29) 0.98   58477.3   12400.00
     15    39024.14  141.97  0.30( 0.29) 0.98   61878.8   12201.00
     16    38007.93  149.52  0.30( 0.29) 0.98   63771.3   12231.00
     17    36954.24  157.09  0.30( 0.29) 0.98   65325.4   10400.00
     18    35336.32  166.65  0.30( 0.29) 0.98   66770.6   12010.00
     19    34268.07  172.14  0.30( 0.29) 0.98   67034.2   10210.00
     20    29757.93  203.00  0.30( 0.29) 0.98   67793.9   10100.00
   TOTAL AREA(ACRES) =    67793.9

**************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    26040.46   24.70  0.30( 0.29) 0.97    5305.5   10300.00
      2    27636.09   31.23  0.30( 0.29) 0.97    7256.7   10400.00
      3    29366.53   37.96  0.30( 0.29) 0.97    9583.8   20700.00
      4    31387.72   46.40  0.30( 0.29) 0.97   12898.6   10100.00
      5    33159.96   53.97  0.30( 0.29) 0.97   16542.4   20300.00
      6    34957.56   66.48  0.30( 0.29) 0.97   22801.7   31400.00
      7    36167.37   77.43  0.30( 0.29) 0.97   28289.4   13100.00
      8    37073.34   83.96  0.30( 0.29) 0.97   31162.1   11801.00
      9    38784.54   94.44  0.30( 0.29) 0.97   36480.0   11530.00
     10    39419.15   99.91  0.30( 0.29) 0.97   39974.4   13510.00
     11    41111.13  112.77  0.30( 0.29) 0.97   48116.5   11350.00
     12    41451.50  117.43  0.30( 0.29) 0.97   51289.6   11130.00
     13    40984.34  123.54  0.30( 0.29) 0.97   54216.7   12300.00
     14    40135.55  132.37  0.30( 0.29) 0.98   58477.3   12400.00
     15    39024.14  141.97  0.30( 0.29) 0.98   61878.8   12201.00
     16    38007.93  149.52  0.30( 0.29) 0.98   63771.3   12231.00
     17    36954.24  157.09  0.30( 0.29) 0.98   65325.4   10400.00
     18    35336.32  166.65  0.30( 0.29) 0.98   66770.6   12010.00
```

```
    19    34268.07  172.14  0.30( 0.29) 0.98   67034.2   10210.00
    20    29757.93  203.00  0.30( 0.29) 0.98   67793.9   10100.00
   TOTAL AREA(ACRES) =     67793.9

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    140.00  DOWNSTREAM(FEET) =    137.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.91   CHANNEL SLOPE =  0.0032
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.90
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.767
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.70      0.30     0.983     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.983
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   41462.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.64
  AVERAGE FLOW DEPTH(FEET) =  16.90   TRAVEL TIME(MIN.) =   1.06
  Tc(MIN.) =  118.49
  SUBAREA AREA(ACRES) =    53.70       SUBAREA RUNOFF(CFS) =   22.80
  EFFECTIVE AREA(ACRES) =  51343.27     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    67847.6         PEAK FLOW RATE(CFS) =   41451.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 16.90   FLOW VELOCITY(FEET/SEC.) =  14.63
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13820.00 =  131542.94 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26040.46   25.90    1.693  0.30( 0.29) 0.97    5359.2   10300.00
      2    27636.09   32.41    1.474  0.30( 0.29) 0.97    7310.4   10400.00
      3    29366.53   39.13    1.339  0.30( 0.29) 0.97    9637.5   20700.00
      4    31387.72   47.54    1.206  0.30( 0.29) 0.97   12952.3   10100.00
      5    33159.96   55.09    1.105  0.30( 0.29) 0.97   16596.1   20300.00
      6    34957.56   67.59    1.000  0.30( 0.29) 0.97   22855.4   31400.00
      7    36167.37   78.53    0.938  0.30( 0.29) 0.97   28343.1   13100.00
      8    37073.34   85.05    0.901  0.30( 0.29) 0.97   31215.8   11801.00
      9    38784.54   95.51    0.852  0.30( 0.29) 0.97   36533.7   11530.00
     10    39419.15  100.98    0.832  0.30( 0.29) 0.97   40028.1   13510.00
     11    41111.13  113.82    0.784  0.30( 0.29) 0.97   48170.2   11350.00
     12    41451.50  118.49    0.767  0.30( 0.29) 0.97   51343.3   11130.00
     13    40984.34  124.60    0.751  0.30( 0.29) 0.97   54270.4   12300.00
     14    40135.55  133.44    0.732  0.30( 0.29) 0.98   58531.0   12400.00
     15    39024.14  143.04    0.711  0.30( 0.29) 0.98   61932.5   12201.00
     16    38007.93  150.60    0.695  0.30( 0.29) 0.98   63825.0   12231.00
```



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     17    36954.24  158.18    0.679  0.30( 0.29) 0.98   65379.1   10400.00
     18    35336.32  167.76    0.658  0.30( 0.29) 0.98   66824.3   12010.00
     19    34268.07  173.25    0.647  0.30( 0.29) 0.98   67087.9   10210.00
     20    29757.93  204.16    0.609  0.30( 0.29) 0.98   67847.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41451.50  Tc(MIN.) =  118.49
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   51343.27

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  118.49
  RAINFALL INTENSITY(INCH/HR) =   0.77
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   51343.27
  TOTAL STREAM AREA(ACRES) =   67847.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   41451.50

****************************************************************************
  FLOW PROCESS FROM NODE  13810.00 TO NODE  13811.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   648.54
  ELEVATION DATA: UPSTREAM(FEET) =    756.46  DOWNSTREAM(FEET) =    586.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.293
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.775
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.58      0.30     1.000     0   12.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.43
  TOTAL AREA(ACRES) =      5.58   PEAK FLOW RATE(CFS) =     12.43

****************************************************************************
  FLOW PROCESS FROM NODE  13811.00 TO NODE  13811.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    586.02  DOWNSTREAM(FEET) =    437.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =   696.28   CHANNEL SLOPE =  0.2130
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.43
```

```
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.497
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       14.79      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.00
 AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   1.93
 Tc(MIN.) =   14.23
 SUBAREA AREA(ACRES) =    14.79       SUBAREA RUNOFF(CFS) =   29.25
 EFFECTIVE AREA(ACRES) =     20.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      40.28
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.53

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =   6.88
 LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13811.50 =    1344.82 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13811.50 TO NODE  13812.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    437.69  DOWNSTREAM(FEET) =    402.36
 CHANNEL LENGTH THRU SUBAREA(FEET) =   681.04   CHANNEL SLOPE =  0.0519
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.261
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       18.41      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.54
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.91
 AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   2.31
 Tc(MIN.) =   16.54
 SUBAREA AREA(ACRES) =    18.41       SUBAREA RUNOFF(CFS) =   32.50
 EFFECTIVE AREA(ACRES) =     38.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       38.8         PEAK FLOW RATE(CFS) =      68.45
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.08

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   5.21
 LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13812.00 =    2025.86 FEET.

****************************************************************************
```



```
 FLOW PROCESS FROM NODE  13812.00 TO NODE  13813.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    402.36  DOWNSTREAM(FEET) =    259.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1282.56   CHANNEL SLOPE =  0.1112
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.027
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       27.87      0.30     0.858     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      90.67
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.39
 AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   2.89
 Tc(MIN.) =   19.43
 SUBAREA AREA(ACRES) =    27.87       SUBAREA RUNOFF(CFS) =   44.38
 EFFECTIVE AREA(ACRES) =     66.65     AREA-AVERAGED Fm(INCH/HR) =   0.28
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
 TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =     104.66
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.11   FLOW VELOCITY(FEET/SEC.) =   7.72
 LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13813.00 =    3308.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   259.72  DOWNSTREAM(FEET) =   137.00
 FLOW LENGTH(FEET) =  2412.88   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  22.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  22.06
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     104.66
 PIPE TRAVEL TIME(MIN.) =   1.82    Tc(MIN.) =   21.26
 LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13820.00 =    5721.30 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   21.26
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.918
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       82.54      0.30      0.570     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.570
  SUBAREA AREA(ACRES) =   82.54      SUBAREA RUNOFF(CFS) =  129.77
  EFFECTIVE AREA(ACRES) =    149.19   AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =      149.2       PEAK FLOW RATE(CFS) =     227.89

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.26
  RAINFALL INTENSITY(INCH/HR) =   1.92
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.74
  EFFECTIVE STREAM AREA(ACRES) =     149.19
  TOTAL STREAM AREA(ACRES) =     149.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     227.89

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26040.46   25.90    1.693  0.30( 0.29) 0.97    5359.2   10300.00
      1    27636.09   32.41    1.474  0.30( 0.29) 0.97    7310.4   10400.00
      1    29366.53   39.13    1.339  0.30( 0.29) 0.97    9637.5   20700.00
      1    31387.72   47.54    1.206  0.30( 0.29) 0.97   12952.3   10100.00
      1    33159.96   55.09    1.105  0.30( 0.29) 0.97   16596.1   20300.00
      1    34957.56   67.59    1.000  0.30( 0.29) 0.97   22855.4   31400.00
      1    36167.37   78.53    0.938  0.30( 0.29) 0.97   28343.1   13100.00
      1    37073.34   85.05    0.901  0.30( 0.29) 0.97   31215.8   11801.00
      1    38784.54   95.51    0.852  0.30( 0.29) 0.97   36533.7   11530.00
      1    39419.15  100.98    0.832  0.30( 0.29) 0.97   40028.1   13510.00
      1    41111.13  113.82    0.784  0.30( 0.29) 0.97   48170.2   11350.00
      1    41451.50  118.49    0.767  0.30( 0.29) 0.97   51343.3   11130.00
      1    40984.34  124.60    0.751  0.30( 0.29) 0.97   54270.4   12300.00
      1    40135.55  133.44    0.732  0.30( 0.29) 0.98   58531.0   12400.00
      1    39024.14  143.04    0.711  0.30( 0.29) 0.98   61932.5   12201.00
      1    38007.93  150.60    0.695  0.30( 0.29) 0.98   63825.0   12231.00
      1    36954.24  158.18    0.679  0.30( 0.29) 0.98   65379.1   10400.00
      1    35336.32  167.76    0.658  0.30( 0.29) 0.98   66824.3   12010.00
      1    34268.07  173.25    0.647  0.30( 0.29) 0.98   67087.9   10210.00
      1    29757.93  204.16    0.609  0.30( 0.29) 0.98   67847.6   10100.00
      2      227.89   21.26    1.918  0.30( 0.22) 0.74     149.2   13810.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25034.13   21.26    1.918  0.30( 0.29) 0.96    4547.6   13810.00
```



```
      2    26238.12   25.90    1.693  0.30( 0.29) 0.97    5508.3   10300.00
      3    27804.42   32.41    1.474  0.30( 0.29) 0.97    7459.6   10400.00
      4    29516.64   39.13    1.339  0.30( 0.29) 0.97    9786.7   20700.00
      5    31520.08   47.54    1.206  0.30( 0.29) 0.97   13101.5   10100.00
      6    33278.68   55.09    1.105  0.30( 0.29) 0.97   16745.3   20300.00
      7    35062.21   67.59    1.000  0.30( 0.29) 0.97   23004.5   31400.00
      8    36263.69   78.53    0.938  0.30( 0.29) 0.96   28492.3   13100.00
      9    37164.70   85.05    0.901  0.30( 0.29) 0.96   31364.9   11801.00
     10    38869.37   95.51    0.852  0.30( 0.29) 0.97   36682.9   11530.00
     11    39501.24  100.98    0.832  0.30( 0.29) 0.97   40177.3   13510.00
     12    41186.79  113.82    0.784  0.30( 0.29) 0.97   48319.4   11350.00
     13    41524.81  118.49    0.767  0.30( 0.29) 0.97   51492.5   11130.00
     14    41055.57  124.60    0.751  0.30( 0.29) 0.97   54419.6   12300.00
     15    40204.23  133.44    0.732  0.30( 0.29) 0.97   58680.2   12400.00
     16    39090.04  143.04    0.711  0.30( 0.29) 0.97   62081.7   12201.00
     17    38071.65  150.60    0.695  0.30( 0.29) 0.98   63974.2   12231.00
     18    37015.78  158.18    0.679  0.30( 0.29) 0.98   65528.3   10400.00
     19    35395.09  167.76    0.658  0.30( 0.29) 0.98   66973.5   12010.00
     20    34325.25  173.25    0.647  0.30( 0.29) 0.98   67237.1   10210.00
     21    29810.11  204.16    0.609  0.30( 0.29) 0.98   67996.7   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   41524.81    Tc(MIN.) =   118.49
  EFFECTIVE AREA(ACRES) =   51492.46   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67996.7
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13820.00 =  131542.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13820.00 TO NODE  13840.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    137.00  DOWNSTREAM(FEET) =    133.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1261.34   CHANNEL SLOPE =  0.0032
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  17.01
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.761
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.60      0.30      0.683     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.683
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   41532.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.54
  AVERAGE FLOW DEPTH(FEET) =  17.00   TRAVEL TIME(MIN.) =   1.45
  Tc(MIN.) =  119.94
  SUBAREA AREA(ACRES) =    31.60       SUBAREA RUNOFF(CFS) =   15.82
  EFFECTIVE AREA(ACRES) =  51524.07     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    68028.3         PEAK FLOW RATE(CFS) =   41524.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  17.00
```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 17.00 FLOW VELOCITY(FEET/SEC.) = 14.54
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25034.13	22.93	1.834	0.30(0.29)	0.96	4579.2	13810.00
2	26238.12	27.55	1.624	0.30(0.29)	0.96	5539.9	10300.00
3	27804.42	34.03	1.442	0.30(0.29)	0.97	7491.2	10400.00
4	29516.64	40.72	1.310	0.30(0.29)	0.97	9818.3	20700.00
5	31520.08	49.11	1.183	0.30(0.29)	0.97	13133.1	10100.00
6	33278.68	56.63	1.085	0.30(0.29)	0.97	16776.9	20300.00
7	35062.21	69.11	0.991	0.30(0.29)	0.97	23036.1	31400.00
8	36263.69	80.03	0.929	0.30(0.29)	0.96	28523.9	13100.00
9	37164.70	86.54	0.893	0.30(0.29)	0.96	31396.5	11801.00
10	38869.37	96.98	0.847	0.30(0.29)	0.97	36714.5	11530.00
11	39501.24	102.45	0.827	0.30(0.29)	0.97	40208.9	13510.00
12	41186.79	115.27	0.779	0.30(0.29)	0.97	48351.0	11350.00
13	41524.81	119.94	0.761	0.30(0.29)	0.97	51524.1	11130.00
14	41055.57	126.05	0.748	0.30(0.29)	0.97	54451.2	12300.00
15	40204.23	134.90	0.729	0.30(0.29)	0.97	58711.8	12400.00
16	39090.04	144.51	0.708	0.30(0.29)	0.97	62113.3	12201.00
17	38071.65	152.09	0.692	0.30(0.29)	0.97	64005.8	12231.00
18	37015.78	159.68	0.676	0.30(0.29)	0.98	65559.9	10400.00
19	35395.09	169.27	0.655	0.30(0.29)	0.98	67005.1	12010.00
20	34325.25	174.78	0.643	0.30(0.29)	0.98	67268.7	10210.00
21	29810.11	205.75	0.608	0.30(0.29)	0.98	68028.3	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 41524.81 Tc(MIN.) = 119.94
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 51524.07

****
FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 119.94
RAINFALL INTENSITY(INCH/HR) = 0.76
AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97
EFFECTIVE STREAM AREA(ACRES) = 51524.07
TOTAL STREAM AREA(ACRES) = 68028.34
PEAK FLOW RATE(CFS) AT CONFLUENCE = 41524.81

****
FLOW PROCESS FROM NODE 13830.00 TO NODE 13831.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========
INITIAL SUBAREA FLOW-LENGTH(FEET) = 744.71
ELEVATION DATA: UPSTREAM(FEET) = 1100.95 DOWNSTREAM(FEET) = 959.21

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.858
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.550
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	5.06	0.30	1.000	0	13.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 10.25
TOTAL AREA(ACRES) = 5.06 PEAK FLOW RATE(CFS) = 10.25

****
FLOW PROCESS FROM NODE 13831.00 TO NODE 13832.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 959.21 DOWNSTREAM(FEET) = 832.83
CHANNEL LENGTH THRU SUBAREA(FEET) = 1076.71 CHANNEL SLOPE = 0.1174
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.65
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.219
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.57	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38.54
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.60
AVERAGE FLOW DEPTH(FEET) = 0.61 TRAVEL TIME(MIN.) = 3.21
Tc(MIN.) = 17.06
SUBAREA AREA(ACRES) = 32.57 SUBAREA RUNOFF(CFS) = 56.25
EFFECTIVE AREA(ACRES) = 37.63 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 37.6 PEAK FLOW RATE(CFS) = 64.99
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.83 FLOW VELOCITY(FEET/SEC.) = 6.73
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13832.00 = 1821.42 FEET.

****
FLOW PROCESS FROM NODE 13832.00 TO NODE 13833.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 832.83 DOWNSTREAM(FEET) = 572.49
CHANNEL LENGTH THRU SUBAREA(FEET) = 1883.58 CHANNEL SLOPE = 0.1382
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

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  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.928
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.23      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      88.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.85
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   4.00
  Tc(MIN.) =   21.06
  SUBAREA AREA(ACRES) =    32.23       SUBAREA RUNOFF(CFS) =   47.22
  EFFECTIVE AREA(ACRES) =     69.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.9         PEAK FLOW RATE(CFS) =     102.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   8.27
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13833.00 =    3705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13833.00 TO NODE  13834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    572.49  DOWNSTREAM(FEET) =    471.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.78   CHANNEL SLOPE =  0.1068
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.829
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.01
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   1.96
  Tc(MIN.) =   23.03
  SUBAREA AREA(ACRES) =    27.51       SUBAREA RUNOFF(CFS) =   37.86
  EFFECTIVE AREA(ACRES) =     97.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =     134.01
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.29   FLOW VELOCITY(FEET/SEC.) =   8.24
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13834.00 =    4648.78 FEET.
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****************************************************************************
  FLOW PROCESS FROM NODE  13834.00 TO NODE  13835.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    471.65  DOWNSTREAM(FEET) =    347.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1647.45   CHANNEL SLOPE =  0.0756
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.673
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     192.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.18
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   3.36
  Tc(MIN.) =   26.38
  SUBAREA AREA(ACRES) =    94.21       SUBAREA RUNOFF(CFS) =  116.41
  EFFECTIVE AREA(ACRES) =    191.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      191.6         PEAK FLOW RATE(CFS) =     236.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.95   FLOW VELOCITY(FEET/SEC.) =   8.73
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13835.00 =    6296.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13835.00 TO NODE  13836.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    347.06  DOWNSTREAM(FEET) =    269.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1696.71   CHANNEL SLOPE =  0.0458
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.88
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.531
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      233.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     366.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.28
  AVERAGE FLOW DEPTH(FEET) =   2.83   TRAVEL TIME(MIN.) =   3.42
  Tc(MIN.) =   29.80
  SUBAREA AREA(ACRES) =   233.25       SUBAREA RUNOFF(CFS) =  258.52
  EFFECTIVE AREA(ACRES) =    424.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
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 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      424.8         PEAK FLOW RATE(CFS) =     470.85
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.22

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.22   FLOW VELOCITY(FEET/SEC.) =   8.89
 LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13836.00 =    7992.94 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13836.00 TO NODE  13837.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    269.29  DOWNSTREAM(FEET) =    191.87
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2529.21   CHANNEL SLOPE =  0.0306
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.420
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      134.70      0.30      0.880     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     540.96
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.98
 AVERAGE FLOW DEPTH(FEET) =   3.83   TRAVEL TIME(MIN.) =   5.28
 Tc(MIN.) =   35.08
 SUBAREA AREA(ACRES) =   134.70       SUBAREA RUNOFF(CFS) =  140.20
 EFFECTIVE AREA(ACRES) =    559.53     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =      559.5         PEAK FLOW RATE(CFS) =     568.63
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.93

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.93   FLOW VELOCITY(FEET/SEC.) =   8.09
 LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13837.00 =   10522.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   191.87  DOWNSTREAM(FEET) =   133.00
 FLOW LENGTH(FEET) =  1151.02   MANNING'S N =  0.013
 DEPTH OF FLOW IN  63.0 INCH PIPE IS  46.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  33.24
 ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     568.63
 PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =   35.65
 LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13840.00 =   11673.17 FEET.
```



```
****************************************************************************
 FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   35.65
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.409
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       5.97      0.30      0.622     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.622
 SUBAREA AREA(ACRES) =    5.97      SUBAREA RUNOFF(CFS) =    6.57
 EFFECTIVE AREA(ACRES) =    565.50   AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =      565.5       PEAK FLOW RATE(CFS) =     569.33

****************************************************************************
 FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   35.65
 RAINFALL INTENSITY(INCH/HR) =   1.41
 AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.97
 EFFECTIVE STREAM AREA(ACRES) =     565.50
 TOTAL STREAM AREA(ACRES) =     565.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     569.33

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1    25034.13   22.93    1.834  0.30( 0.29) 0.96    4579.2   13810.00
     1    26238.12   27.55    1.624  0.30( 0.29) 0.96    5539.9   10300.00
     1    27804.42   34.03    1.442  0.30( 0.29) 0.97    7491.2   10400.00
     1    29516.64   40.72    1.310  0.30( 0.29) 0.97    9818.3   20700.00
     1    31520.08   49.11    1.183  0.30( 0.29) 0.97   13133.1   10100.00
     1    33278.68   56.63    1.085  0.30( 0.29) 0.97   16776.9   20300.00
     1    35062.21   69.11    0.991  0.30( 0.29) 0.97   23036.1   31400.00
     1    36263.69   80.03    0.929  0.30( 0.29) 0.96   28523.9   13100.00
     1    37164.70   86.54    0.893  0.30( 0.29) 0.96   31396.5   11801.00
     1    38869.37   96.98    0.847  0.30( 0.29) 0.97   36714.5   11530.00
     1    39501.24  102.45    0.827  0.30( 0.29) 0.97   40208.9   13510.00
     1    41186.79  115.27    0.779  0.30( 0.29) 0.97   48351.0   11350.00
     1    41524.81  119.94    0.761  0.30( 0.29) 0.97   51524.1   11130.00
     1    41055.57  126.05    0.748  0.30( 0.29) 0.97   54451.2   12300.00
     1    40204.23  134.90    0.729  0.30( 0.29) 0.97   58711.8   12400.00
     1    39090.04  144.51    0.708  0.30( 0.29) 0.97   62113.3   12201.00
     1    38071.65  152.09    0.692  0.30( 0.29) 0.97   64005.8   12231.00
     1    37015.78  159.68    0.676  0.30( 0.29) 0.98   65559.9   10400.00
     1    35395.09  169.27    0.655  0.30( 0.29) 0.98   67005.1   12010.00
```

1	34325.25	174.78	0.643	0.30(0.29)	0.98	67268.7	10210.00
1	29810.11	205.75	0.608	0.30(0.29)	0.98	68028.3	10100.00
2	569.33	35.65	1.409	0.30(0.29)	0.97	565.5	13830.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25539.42	22.93	1.834	0.30(0.29)	0.96	4942.8	13810.00
2	26762.85	27.55	1.624	0.30(0.29)	0.96	5976.9	10300.00
3	28363.77	34.03	1.442	0.30(0.29)	0.97	8031.0	10400.00
4	28788.73	35.65	1.409	0.30(0.29)	0.97	8620.7	13830.00
5	30035.72	40.72	1.310	0.30(0.29)	0.97	10383.8	20700.00
6	31974.28	49.11	1.183	0.30(0.29)	0.97	13698.6	10100.00
7	33683.45	56.63	1.085	0.30(0.29)	0.97	17342.4	20300.00
8	35419.10	69.11	0.991	0.30(0.29)	0.97	23601.6	31400.00
9	36589.07	80.03	0.929	0.30(0.29)	0.96	29089.4	13100.00
10	37471.31	86.54	0.893	0.30(0.29)	0.96	31962.0	11801.00
11	39152.73	96.98	0.847	0.30(0.29)	0.97	37280.0	11530.00
12	39774.22	102.45	0.827	0.30(0.29)	0.97	40774.4	13510.00
13	41435.40	115.27	0.779	0.30(0.29)	0.97	48916.5	11350.00
14	41764.56	119.94	0.761	0.30(0.29)	0.97	52089.6	11130.00
15	41288.58	126.05	0.748	0.30(0.29)	0.97	55016.7	12300.00
16	40427.56	134.90	0.729	0.30(0.29)	0.97	59277.3	12400.00
17	39302.86	144.51	0.708	0.30(0.29)	0.97	62678.8	12201.00
18	38276.17	152.09	0.692	0.30(0.29)	0.97	64571.3	12231.00
19	37212.00	159.68	0.676	0.30(0.29)	0.98	66125.4	10400.00
20	35580.81	169.27	0.655	0.30(0.29)	0.98	67570.6	12010.00
21	34504.95	174.78	0.643	0.30(0.29)	0.98	67834.2	10210.00
22	29971.71	205.75	0.608	0.30(0.29)	0.98	68593.8	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 41764.56 Tc(MIN.) = 119.94
EFFECTIVE AREA(ACRES) = 52089.57 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 68593.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

****
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 133.00 DOWNSTREAM(FEET) = 130.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.44 CHANNEL SLOPE = 0.0046
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 15.51
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.760
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.61	0.30	0.975	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.975

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41765.95
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.61
AVERAGE FLOW DEPTH(FEET) = 15.51 TRAVEL TIME(MIN.) = 0.66
Tc(MIN.) = 120.59
SUBAREA AREA(ACRES) = 6.61 SUBAREA RUNOFF(CFS) = 2.78
EFFECTIVE AREA(ACRES) = 52096.18 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 68600.5 PEAK FLOW RATE(CFS) = 41764.56
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 15.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 15.51 FLOW VELOCITY(FEET/SEC.) = 16.62
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25539.42	23.68	1.796	0.30(0.29)	0.96	4949.4	13810.00
2	26762.85	28.29	1.594	0.30(0.29)	0.96	5983.5	10300.00
3	28363.77	34.77	1.427	0.30(0.29)	0.97	8037.6	10400.00
4	28788.73	36.38	1.394	0.30(0.29)	0.97	8627.3	13830.00
5	30035.72	41.44	1.299	0.30(0.29)	0.97	10390.4	20700.00
6	31974.28	49.81	1.172	0.30(0.29)	0.97	13705.2	10100.00
7	33683.45	57.33	1.077	0.30(0.29)	0.97	17349.0	20300.00
8	35419.10	69.79	0.987	0.30(0.29)	0.97	23608.3	31400.00
9	36589.07	80.72	0.926	0.30(0.29)	0.96	29096.0	13100.00
10	37471.31	87.22	0.889	0.30(0.29)	0.96	31968.7	11801.00
11	39152.73	97.65	0.844	0.30(0.29)	0.97	37286.6	11530.00
12	39774.22	103.12	0.824	0.30(0.29)	0.97	40781.0	13510.00
13	41435.40	115.93	0.776	0.30(0.29)	0.97	48923.1	11350.00
14	41764.56	120.59	0.760	0.30(0.29)	0.97	52096.2	11130.00
15	41288.58	126.71	0.747	0.30(0.29)	0.97	55023.3	12300.00
16	40427.56	135.56	0.728	0.30(0.29)	0.97	59283.9	12400.00
17	39302.86	145.18	0.707	0.30(0.29)	0.97	62685.4	12201.00
18	38276.17	152.76	0.691	0.30(0.29)	0.97	64577.9	12231.00
19	37212.00	160.35	0.674	0.30(0.29)	0.98	66132.0	10400.00
20	35580.81	169.96	0.654	0.30(0.29)	0.98	67577.2	12010.00
21	34504.95	175.47	0.642	0.30(0.29)	0.98	67840.8	10210.00
22	29971.71	206.47	0.607	0.30(0.29)	0.98	68600.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 41764.56 Tc(MIN.) = 120.59
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 52096.18

****
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 120.59
RAINFALL INTENSITY(INCH/HR) = 0.76
AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30

```
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52096.18
  TOTAL STREAM AREA(ACRES) =   68600.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   41764.56

****************************************************************************
  FLOW PROCESS FROM NODE  13850.00 TO NODE  13851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   617.57
  ELEVATION DATA: UPSTREAM(FEET) =    646.95  DOWNSTREAM(FEET) =    490.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.137
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.797
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        4.95      0.30     1.000     0   12.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.12
  TOTAL AREA(ACRES) =      4.95   PEAK FLOW RATE(CFS) =     11.12

****************************************************************************
  FLOW PROCESS FROM NODE  13851.00 TO NODE  13851.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.10  DOWNSTREAM(FEET) =    440.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   351.14   CHANNEL SLOPE =  0.1399
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.34
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.598
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.23
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   1.38
  Tc(MIN.) =   13.52
  SUBAREA AREA(ACRES) =     4.02       SUBAREA RUNOFF(CFS) =    8.32
  EFFECTIVE AREA(ACRES) =      8.97     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.0         PEAK FLOW RATE(CFS) =      18.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   4.58
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13851.50 =     968.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13851.50 TO NODE  13852.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    440.98  DOWNSTREAM(FEET) =    395.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.91   CHANNEL SLOPE =  0.0882
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.53
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.349
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.17      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.42
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   15.45
  SUBAREA AREA(ACRES) =     7.17       SUBAREA RUNOFF(CFS) =   13.22
  EFFECTIVE AREA(ACRES) =     16.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       16.1         PEAK FLOW RATE(CFS) =      29.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.57   FLOW VELOCITY(FEET/SEC.) =   4.69
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13852.00 =    1481.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13852.00 TO NODE  13853.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    395.76  DOWNSTREAM(FEET) =    354.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   443.69   CHANNEL SLOPE =  0.0920
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.63
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.230
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.76      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.04
  AVERAGE FLOW DEPTH(FEET) =   0.63   TRAVEL TIME(MIN.) =   1.47
```

```
  Tc(MIN.) =   16.92
  SUBAREA AREA(ACRES) =     6.76       SUBAREA RUNOFF(CFS) =   11.74
  EFFECTIVE AREA(ACRES) =     22.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.9         PEAK FLOW RATE(CFS) =      39.79
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   5.25
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13853.00 =    1925.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13853.00 TO NODE  13854.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    354.94  DOWNSTREAM(FEET) =    263.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.09   CHANNEL SLOPE =  0.0950
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.81
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.009
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.87
  AVERAGE FLOW DEPTH(FEET) =   0.79   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   19.65
  SUBAREA AREA(ACRES) =    18.16       SUBAREA RUNOFF(CFS) =   27.94
  EFFECTIVE AREA(ACRES) =     41.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.1         PEAK FLOW RATE(CFS) =      63.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   6.21
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13854.00 =    2887.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13854.00 TO NODE  13855.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    263.57  DOWNSTREAM(FEET) =    188.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1228.77   CHANNEL SLOPE =  0.0609
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23
```



```
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.828
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.75      0.30     0.879     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.879
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      90.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.02
  AVERAGE FLOW DEPTH(FEET) =   1.21   TRAVEL TIME(MIN.) =   3.40
  Tc(MIN.) =   23.06
  SUBAREA AREA(ACRES) =    38.75       SUBAREA RUNOFF(CFS) =   54.54
  EFFECTIVE AREA(ACRES) =     79.81     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       79.8         PEAK FLOW RATE(CFS) =     111.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =   6.41
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13855.00 =    4116.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   188.74  DOWNSTREAM(FEET) =   130.00
  FLOW LENGTH(FEET) =  2092.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.74
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     111.00
  PIPE TRAVEL TIME(MIN.) =   1.97    Tc(MIN.) =   25.02
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13860.00 =    6208.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   25.02
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.729
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.41      0.30     0.707     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.707
  SUBAREA AREA(ACRES) =   43.41      SUBAREA RUNOFF(CFS) =   59.27
  EFFECTIVE AREA(ACRES) =    123.22   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      123.2       PEAK FLOW RATE(CFS) =     163.19

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =   1
```

```
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.02
  RAINFALL INTENSITY(INCH/HR) =   1.73
  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.86
  EFFECTIVE STREAM AREA(ACRES) =     123.22
  TOTAL STREAM AREA(ACRES) =     123.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     163.19

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25539.42   23.68    1.796  0.30( 0.29) 0.96    4949.4   13810.00
      1    26762.85   28.29    1.594  0.30( 0.29) 0.96    5983.5   10300.00
      1    28363.77   34.77    1.427  0.30( 0.29) 0.97    8037.6   10400.00
      1    28788.73   36.38    1.394  0.30( 0.29) 0.97    8627.3   13830.00
      1    30035.72   41.44    1.299  0.30( 0.29) 0.97   10390.4   20700.00
      1    31974.28   49.81    1.172  0.30( 0.29) 0.97   13705.2   10100.00
      1    33683.45   57.33    1.077  0.30( 0.29) 0.97   17349.0   20300.00
      1    35419.10   69.79    0.987  0.30( 0.29) 0.97   23608.3   31400.00
      1    36589.07   80.72    0.926  0.30( 0.29) 0.96   29096.0   13100.00
      1    37471.31   87.22    0.889  0.30( 0.29) 0.96   31968.7   11801.00
      1    39152.73   97.65    0.844  0.30( 0.29) 0.97   37286.6   11530.00
      1    39774.22  103.12    0.824  0.30( 0.29) 0.97   40781.0   13510.00
      1    41435.40  115.93    0.776  0.30( 0.29) 0.97   48923.1   11350.00
      1    41764.56  120.59    0.760  0.30( 0.29) 0.97   52096.2   11130.00
      1    41288.58  126.71    0.747  0.30( 0.29) 0.97   55023.3   12300.00
      1    40427.56  135.56    0.728  0.30( 0.29) 0.97   59283.9   12400.00
      1    39302.86  145.18    0.707  0.30( 0.29) 0.97   62685.4   12201.00
      1    38276.17  152.76    0.691  0.30( 0.29) 0.97   64577.9   12231.00
      1    37212.00  160.35    0.674  0.30( 0.29) 0.98   66132.0   10400.00
      1    35580.81  169.96    0.654  0.30( 0.29) 0.98   67577.2   12010.00
      1    34504.95  175.47    0.642  0.30( 0.29) 0.98   67840.8   10210.00
      1    29971.71  206.47    0.607  0.30( 0.29) 0.98   68600.5   10100.00
      2      163.19   25.02    1.729  0.30( 0.26) 0.86     123.2   13850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25700.92   23.68    1.796  0.30( 0.29) 0.96    5066.1   13810.00
      2    26057.37   25.02    1.729  0.30( 0.29) 0.96    5372.5   13850.00
      3    26911.01   28.29    1.594  0.30( 0.29) 0.96    6106.7   10300.00
      4    28493.43   34.77    1.427  0.30( 0.29) 0.96    8160.8   10400.00
      5    28914.77   36.38    1.394  0.30( 0.29) 0.97    8750.6   13830.00
      6    30151.22   41.44    1.299  0.30( 0.29) 0.97   10513.6   20700.00
      7    32075.67   49.81    1.172  0.30( 0.29) 0.97   13828.4   10100.00
      8    33774.29   57.33    1.077  0.30( 0.29) 0.97   17472.2   20300.00
      9    35500.05   69.79    0.987  0.30( 0.29) 0.97   23731.5   31400.00
     10    36663.16   80.72    0.926  0.30( 0.29) 0.96   29219.2   13100.00
```



```
     11    37541.31   87.22    0.889  0.30( 0.29) 0.96   32091.9   11801.00
     12    39217.81   97.65    0.844  0.30( 0.29) 0.97   37409.8   11530.00
     13    39837.04  103.12    0.824  0.30( 0.29) 0.97   40904.2   13510.00
     14    41492.91  115.93    0.776  0.30( 0.29) 0.97   49046.3   11350.00
     15    41820.25  120.59    0.760  0.30( 0.29) 0.97   52219.4   11130.00
     16    41342.81  126.71    0.747  0.30( 0.29) 0.97   55146.5   12300.00
     17    40479.68  135.56    0.728  0.30( 0.29) 0.97   59407.1   12400.00
     18    39352.68  145.18    0.707  0.30( 0.29) 0.97   62808.6   12201.00
     19    38324.19  152.76    0.691  0.30( 0.29) 0.97   64701.2   12231.00
     20    37258.20  160.35    0.674  0.30( 0.29) 0.97   66255.2   10400.00
     21    35624.73  169.96    0.654  0.30( 0.29) 0.98   67700.4   12010.00
     22    34547.55  175.47    0.642  0.30( 0.29) 0.98   67964.0   10210.00
     23    30010.46  206.47    0.607  0.30( 0.29) 0.98   68723.7   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   41820.25    Tc(MIN.) =   120.59
  EFFECTIVE AREA(ACRES) =   52219.39   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68723.7
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13860.00 =  133458.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13860.00 TO NODE  13880.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    130.00  DOWNSTREAM(FEET) =    120.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   610.77   CHANNEL SLOPE =  0.0154
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.759
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   41821.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  25.59
  AVERAGE FLOW DEPTH(FEET) =  11.27   TRAVEL TIME(MIN.) =   0.40
  Tc(MIN.) =  120.99
  SUBAREA AREA(ACRES) =     4.89       SUBAREA RUNOFF(CFS) =    2.02
  EFFECTIVE AREA(ACRES) =  52224.29     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    68728.6         PEAK FLOW RATE(CFS) =   41820.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.27   FLOW VELOCITY(FEET/SEC.) =  25.59
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13880.00 =  134069.48 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25700.92   24.15    1.773  0.30( 0.29) 0.96    5071.0   13810.00
      2    26057.37   25.48    1.710  0.30( 0.29) 0.96    5377.4   13850.00
      3    26911.01   28.75    1.575  0.30( 0.29) 0.96    6111.6   10300.00
      4    28493.43   35.21    1.418  0.30( 0.29) 0.96    8165.7   10400.00
      5    28914.77   36.83    1.385  0.30( 0.29) 0.97    8755.4   13830.00
      6    30151.22   41.88    1.292  0.30( 0.29) 0.97   10518.5   20700.00
      7    32075.67   50.24    1.166  0.30( 0.29) 0.97   13833.3   10100.00
      8    33774.29   57.75    1.071  0.30( 0.29) 0.97   17477.1   20300.00
      9    35500.05   70.21    0.985  0.30( 0.29) 0.97   23736.4   31400.00
     10    36663.16   81.13    0.923  0.30( 0.29) 0.96   29224.1   13100.00
     11    37541.31   87.63    0.886  0.30( 0.29) 0.96   32096.8   11801.00
     12    39217.81   98.06    0.843  0.30( 0.29) 0.97   37414.7   11530.00
     13    39837.04  103.52    0.823  0.30( 0.29) 0.97   40909.1   13510.00
     14    41492.91  116.33    0.775  0.30( 0.29) 0.97   49051.2   11350.00
     15    41820.25  120.99    0.759  0.30( 0.29) 0.97   52224.3   11130.00
     16    41342.81  127.11    0.746  0.30( 0.29) 0.97   55151.4   12300.00
     17    40479.68  135.96    0.727  0.30( 0.29) 0.97   59412.0   12400.00
     18    39352.68  145.58    0.706  0.30( 0.29) 0.97   62813.5   12201.00
     19    38324.19  153.17    0.690  0.30( 0.29) 0.97   64706.0   12231.00
     20    37258.20  160.77    0.673  0.30( 0.29) 0.97   66260.1   10400.00
     21    35624.73  170.38    0.653  0.30( 0.29) 0.98   67705.3   12010.00
     22    34547.55  175.89    0.641  0.30( 0.29) 0.98   67968.9   10210.00
     23    30010.46  206.91    0.607  0.30( 0.29) 0.98   68728.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41820.25  Tc(MIN.) =  120.99
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   52224.29

****************************************************************************
  FLOW PROCESS FROM NODE  13860.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  120.99
  RAINFALL INTENSITY(INCH/HR) =   0.76
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52224.29
  TOTAL STREAM AREA(ACRES) =   68728.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   41820.25

****************************************************************************
  FLOW PROCESS FROM NODE  13870.00 TO NODE  13871.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   872.65
  ELEVATION DATA: UPSTREAM(FEET) =    558.52  DOWNSTREAM(FEET) =    436.47

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.704
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.329
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        9.32      0.30     1.000     0   15.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     17.02
  TOTAL AREA(ACRES) =      9.32   PEAK FLOW RATE(CFS) =     17.02

****************************************************************************
  FLOW PROCESS FROM NODE  13871.00 TO NODE  13872.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.47  DOWNSTREAM(FEET) =    337.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =   827.95   CHANNEL SLOPE =  0.1194
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.111
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.12
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   18.40
  SUBAREA AREA(ACRES) =    14.27       SUBAREA RUNOFF(CFS) =   23.26
  EFFECTIVE AREA(ACRES) =     23.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =      38.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   5.64
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13872.00 =    1700.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13872.00 TO NODE  13873.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    337.62  DOWNSTREAM(FEET) =    253.88
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1049.16   CHANNEL SLOPE =  0.0798
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.95
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.913
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -       35.74      0.30     0.923     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.923
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.90
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   21.36
  SUBAREA AREA(ACRES) =    35.74       SUBAREA RUNOFF(CFS) =   52.62
  EFFECTIVE AREA(ACRES) =     59.33     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =       59.3         PEAK FLOW RATE(CFS) =      86.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   6.50
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13873.00 =    2749.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13873.00 TO NODE  13874.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    253.88  DOWNSTREAM(FEET) =    160.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1518.60   CHANNEL SLOPE =  0.0613
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.762
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.43      0.30     0.900     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     108.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.41
  AVERAGE FLOW DEPTH(FEET) =   1.07   TRAVEL TIME(MIN.) =   3.01
  Tc(MIN.) =   24.37
  SUBAREA AREA(ACRES) =    32.43       SUBAREA RUNOFF(CFS) =   43.54
  EFFECTIVE AREA(ACRES) =     91.76     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       91.8         PEAK FLOW RATE(CFS) =     122.32
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.14   FLOW VELOCITY(FEET/SEC.) =   8.74
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13874.00 =    4268.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13874.00 TO NODE  13875.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    160.73  DOWNSTREAM(FEET) =    158.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   582.74   CHANNEL SLOPE =  0.0044
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.83
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.652
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.67      0.30     0.930     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.930
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     167.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.85
  AVERAGE FLOW DEPTH(FEET) =   2.80   TRAVEL TIME(MIN.) =   2.52
  Tc(MIN.) =   26.90
  SUBAREA AREA(ACRES) =    73.67       SUBAREA RUNOFF(CFS) =   91.01
  EFFECTIVE AREA(ACRES) =    165.43     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =      165.4         PEAK FLOW RATE(CFS) =     204.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.10   FLOW VELOCITY(FEET/SEC.) =   4.07
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13875.00 =    4851.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.14  DOWNSTREAM(FEET) =   120.57
  FLOW LENGTH(FEET) =  1855.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  37.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.17
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     204.24
  PIPE TRAVEL TIME(MIN.) =   1.70    Tc(MIN.) =   28.60
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13880.00 =    6706.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   28.60
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.581
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.90      0.30     0.743     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.743
  SUBAREA AREA(ACRES) =   34.90      SUBAREA RUNOFF(CFS) =   42.66
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  EFFECTIVE AREA(ACRES) =    200.33   AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.90
  TOTAL AREA(ACRES) =      200.3       PEAK FLOW RATE(CFS) =     236.42

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.60
  RAINFALL INTENSITY(INCH/HR) =   1.58
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.90
  EFFECTIVE STREAM AREA(ACRES) =     200.33
  TOTAL STREAM AREA(ACRES) =     200.33
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     236.42

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25700.92   24.15    1.773  0.30( 0.29) 0.96    5071.0   13810.00
      1    26057.37   25.48    1.710  0.30( 0.29) 0.96    5377.4   13850.00
      1    26911.01   28.75    1.575  0.30( 0.29) 0.96    6111.6   10300.00
      1    28493.43   35.21    1.418  0.30( 0.29) 0.96    8165.7   10400.00
      1    28914.77   36.83    1.385  0.30( 0.29) 0.97    8755.4   13830.00
      1    30151.22   41.88    1.292  0.30( 0.29) 0.97   10518.5   20700.00
      1    32075.67   50.24    1.166  0.30( 0.29) 0.97   13833.3   10100.00
      1    33774.29   57.75    1.071  0.30( 0.29) 0.97   17477.1   20300.00
      1    35500.05   70.21    0.985  0.30( 0.29) 0.97   23736.4   31400.00
      1    36663.16   81.13    0.923  0.30( 0.29) 0.96   29224.1   13100.00
      1    37541.31   87.63    0.886  0.30( 0.29) 0.96   32096.8   11801.00
      1    39217.81   98.06    0.843  0.30( 0.29) 0.97   37414.7   11530.00
      1    39837.04  103.52    0.823  0.30( 0.29) 0.97   40909.1   13510.00
      1    41492.91  116.33    0.775  0.30( 0.29) 0.97   49051.2   11350.00
      1    41820.25  120.99    0.759  0.30( 0.29) 0.97   52224.3   11130.00
      1    41342.81  127.11    0.746  0.30( 0.29) 0.97   55151.4   12300.00
      1    40479.68  135.96    0.727  0.30( 0.29) 0.97   59412.0   12400.00
      1    39352.68  145.58    0.706  0.30( 0.29) 0.97   62813.5   12201.00
      1    38324.19  153.17    0.690  0.30( 0.29) 0.97   64706.0   12231.00
      1    37258.20  160.77    0.673  0.30( 0.29) 0.97   66260.1   10400.00
      1    35624.73  170.38    0.653  0.30( 0.29) 0.98   67705.3   12010.00
      1    34547.55  175.89    0.641  0.30( 0.29) 0.98   67968.9   10210.00
      1    30010.46  206.91    0.607  0.30( 0.29) 0.98   68728.6   10100.00
      2      236.42   28.60    1.581  0.30( 0.27) 0.90     200.3   13870.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25929.73   24.15    1.773  0.30( 0.29) 0.96    5240.1   13810.00
      2    26288.74   25.48    1.710  0.30( 0.29) 0.96    5555.9   13850.00
      3    27107.85   28.60    1.581  0.30( 0.29) 0.96    6277.9   13870.00
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      4    27146.29   28.75    1.575  0.30( 0.29) 0.96    6311.9   10300.00
      5    28700.39   35.21    1.418  0.30( 0.29) 0.96    8366.1   10400.00
      6    29115.84   36.83    1.385  0.30( 0.29) 0.96    8955.8   13830.00
      7    30335.60   41.88    1.292  0.30( 0.29) 0.97   10718.9   20700.00
      8    32237.24   50.24    1.166  0.30( 0.29) 0.97   14033.6   10100.00
      9    33918.79   57.75    1.071  0.30( 0.29) 0.97   17677.4   20300.00
     10    35629.02   70.21    0.985  0.30( 0.29) 0.97   23936.7   31400.00
     11    36780.97   81.13    0.923  0.30( 0.29) 0.96   29424.4   13100.00
     12    37652.48   87.63    0.886  0.30( 0.29) 0.96   32297.1   11801.00
     13    39321.14   98.06    0.843  0.30( 0.29) 0.96   37615.0   11530.00
     14    39936.70  103.52    0.823  0.30( 0.29) 0.97   41109.5   13510.00
     15    41583.95  116.33    0.775  0.30( 0.29) 0.97   49251.5   11350.00
     16    41908.43  120.99    0.759  0.30( 0.29) 0.97   52424.6   11130.00
     17    41428.61  127.11    0.746  0.30( 0.29) 0.97   55351.8   12300.00
     18    40562.06  135.96    0.727  0.30( 0.29) 0.97   59612.3   12400.00
     19    39431.33  145.58    0.706  0.30( 0.29) 0.97   63013.8   12201.00
     20    38399.89  153.17    0.690  0.30( 0.29) 0.97   64906.4   12231.00
     21    37330.96  160.77    0.673  0.30( 0.29) 0.97   66460.4   10400.00
     22    35693.76  170.38    0.653  0.30( 0.29) 0.98   67905.7   12010.00
     23    34614.45  175.89    0.641  0.30( 0.29) 0.98   68169.2   10210.00
     24    30071.18  206.91    0.607  0.30( 0.29) 0.98   68928.9   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   41908.43    Tc(MIN.) =   120.99
  EFFECTIVE AREA(ACRES) =   52424.61   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68928.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13880.00 =  134069.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    120.57  DOWNSTREAM(FEET) =    119.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1190.21   CHANNEL SLOPE =  0.0007
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  24.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.754
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.69      0.30      0.724     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.724
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   41936.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.56
  AVERAGE FLOW DEPTH(FEET) =  24.67   TRAVEL TIME(MIN.) =   2.32
  Tc(MIN.) =  123.31
  SUBAREA AREA(ACRES) =   117.69       SUBAREA RUNOFF(CFS) =   56.85
  EFFECTIVE AREA(ACRES) =  52542.30     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69046.6         PEAK FLOW RATE(CFS) =   41908.43
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
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 *ESTIMATED CHANNEL HEIGHT(FEET) =  24.66

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 24.66   FLOW VELOCITY(FEET/SEC.) =   8.55
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13910.00 =  135259.69 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    25929.73   26.78    1.656  0.30( 0.29) 0.95    5357.8   13810.00
     2    26288.74   28.11    1.601  0.30( 0.29) 0.95    5673.6   13850.00
     3    27107.85   31.21    1.499  0.30( 0.29) 0.96    6395.6   13870.00
     4    27146.29   31.36    1.496  0.30( 0.29) 0.96    6429.6   10300.00
     5    28700.39   37.78    1.366  0.30( 0.29) 0.96    8483.8   10400.00
     6    29115.84   39.39    1.333  0.30( 0.29) 0.96    9073.5   13830.00
     7    30335.60   44.41    1.254  0.30( 0.29) 0.96   10836.6   20700.00
     8    32237.24   52.73    1.135  0.30( 0.29) 0.97   14151.3   10100.00
     9    33918.79   60.21    1.042  0.30( 0.29) 0.97   17795.1   20300.00
    10    35629.02   72.63    0.971  0.30( 0.29) 0.96   24054.4   31400.00
    11    36780.97   83.53    0.910  0.30( 0.29) 0.96   29542.1   13100.00
    12    37652.48   90.02    0.873  0.30( 0.29) 0.96   32414.8   11801.00
    13    39321.14  100.42    0.834  0.30( 0.29) 0.96   37732.7   11530.00
    14    39936.70  105.87    0.814  0.30( 0.29) 0.97   41227.2   13510.00
    15    41583.95  118.65    0.766  0.30( 0.29) 0.97   49369.2   11350.00
    16    41908.43  123.31    0.754  0.30( 0.29) 0.97   52542.3   11130.00
    17    41428.61  129.43    0.741  0.30( 0.29) 0.97   55469.5   12300.00
    18    40562.06  138.30    0.722  0.30( 0.29) 0.97   59730.0   12400.00
    19    39431.33  147.94    0.701  0.30( 0.29) 0.97   63131.5   12201.00
    20    38399.89  155.54    0.685  0.30( 0.29) 0.97   65024.1   12231.00
    21    37330.96  163.16    0.668  0.30( 0.29) 0.97   66578.1   10400.00
    22    35693.76  172.80    0.647  0.30( 0.29) 0.97   68023.3   12010.00
    23    34614.45  178.33    0.636  0.30( 0.29) 0.97   68286.9   10210.00
    24    30071.18  209.45    0.604  0.30( 0.29) 0.98   69046.6   10100.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =   41908.43  Tc(MIN.) =  123.31
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   52542.30

****************************************************************************
 FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  123.31
 RAINFALL INTENSITY(INCH/HR) =   0.75
 AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.97
 EFFECTIVE STREAM AREA(ACRES) =   52542.30
 TOTAL STREAM AREA(ACRES) =   69046.58
 PEAK FLOW RATE(CFS) AT CONFLUENCE =   41908.43

****************************************************************************
 FLOW PROCESS FROM NODE  13889.00 TO NODE  13890.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```



```
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   447.89
 ELEVATION DATA: UPSTREAM(FEET) =    564.89  DOWNSTREAM(FEET) =    421.92

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.976
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.093
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 PUBLIC PARK                -        3.03      0.30      0.960     0    6.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.960
 SUBAREA RUNOFF(CFS) =     10.38
 TOTAL AREA(ACRES) =      3.03   PEAK FLOW RATE(CFS) =     10.38

****************************************************************************
 FLOW PROCESS FROM NODE  13890.00 TO NODE  13891.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    421.92  DOWNSTREAM(FEET) =    392.64
 CHANNEL LENGTH THRU SUBAREA(FEET) =   435.33   CHANNEL SLOPE =  0.0673
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.43
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.621
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        8.12      0.30      0.986     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.58
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.03
 AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =   1.44
 Tc(MIN.) =    8.42
 SUBAREA AREA(ACRES) =     8.12       SUBAREA RUNOFF(CFS) =   24.30
 EFFECTIVE AREA(ACRES) =     11.15     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =       11.1         PEAK FLOW RATE(CFS) =      33.39
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   5.80
 LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13891.00 =     883.22 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13891.00 TO NODE  13892.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    392.64  DOWNSTREAM(FEET) =    324.46
```

```
 CHANNEL LENGTH THRU SUBAREA(FEET) =   662.40   CHANNEL SLOPE =  0.1029
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.60
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.151
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       12.50      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.46
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.69
 AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   1.44
 Tc(MIN.) =    9.86
 SUBAREA AREA(ACRES) =    12.50       SUBAREA RUNOFF(CFS) =   32.08
 EFFECTIVE AREA(ACRES) =     23.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =      60.75
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   8.22
 LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13892.00 =    1545.62 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13892.00 TO NODE  13893.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    324.46  DOWNSTREAM(FEET) =    240.82
 CHANNEL LENGTH THRU SUBAREA(FEET) =   980.03   CHANNEL SLOPE =  0.0853
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.82
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.847
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       15.87      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      78.96
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.46
 AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   1.93
 Tc(MIN.) =   11.79
 SUBAREA AREA(ACRES) =    15.87       SUBAREA RUNOFF(CFS) =   36.39
 EFFECTIVE AREA(ACRES) =     39.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =       39.5         PEAK FLOW RATE(CFS) =      90.67
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
 DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   8.85
 LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13893.00 =    2525.65 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13893.00 TO NODE  13894.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    240.82  DOWNSTREAM(FEET) =    163.04
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1144.35   CHANNEL SLOPE =  0.0680
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.542
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       28.41      0.30     0.985     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.985
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     119.44
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.96
 AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   2.13
 Tc(MIN.) =   13.92
 SUBAREA AREA(ACRES) =    28.41       SUBAREA RUNOFF(CFS) =   57.44
 EFFECTIVE AREA(ACRES) =     67.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =     137.24
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.18   FLOW VELOCITY(FEET/SEC.) =   9.41
 LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13894.00 =    3670.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   163.04  DOWNSTREAM(FEET) =   119.70
 FLOW LENGTH(FEET) =  1899.01   MANNING'S N =  0.013
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  17.06
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     137.24
 PIPE TRAVEL TIME(MIN.) =   1.86    Tc(MIN.) =   15.77
 LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13910.00 =    5569.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   15.77
```

```
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.324
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.69      0.30     0.634     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.634
  SUBAREA AREA(ACRES) =   11.69      SUBAREA RUNOFF(CFS) =   22.45
  EFFECTIVE AREA(ACRES) =     79.62   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.94
  TOTAL AREA(ACRES) =       79.6       PEAK FLOW RATE(CFS) =     146.34

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.77
  RAINFALL INTENSITY(INCH/HR) =   2.32
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.94
  EFFECTIVE STREAM AREA(ACRES) =      79.62
  TOTAL STREAM AREA(ACRES) =      79.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     146.34

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25929.73   26.78    1.656  0.30( 0.29) 0.95    5357.8   13810.00
      1    26288.74   28.11    1.601  0.30( 0.29) 0.95    5673.6   13850.00
      1    27107.85   31.21    1.499  0.30( 0.29) 0.96    6395.6   13870.00
      1    27146.29   31.36    1.496  0.30( 0.29) 0.96    6429.6   10300.00
      1    28700.39   37.78    1.366  0.30( 0.29) 0.96    8483.8   10400.00
      1    29115.84   39.39    1.333  0.30( 0.29) 0.96    9073.5   13830.00
      1    30335.60   44.41    1.254  0.30( 0.29) 0.96   10836.6   20700.00
      1    32237.24   52.73    1.135  0.30( 0.29) 0.97   14151.3   10100.00
      1    33918.79   60.21    1.042  0.30( 0.29) 0.97   17795.1   20300.00
      1    35629.02   72.63    0.971  0.30( 0.29) 0.96   24054.4   31400.00
      1    36780.97   83.53    0.910  0.30( 0.29) 0.96   29542.1   13100.00
      1    37652.48   90.02    0.873  0.30( 0.29) 0.96   32414.8   11801.00
      1    39321.14  100.42    0.834  0.30( 0.29) 0.96   37732.7   11530.00
      1    39936.70  105.87    0.814  0.30( 0.29) 0.97   41227.2   13510.00
      1    41583.95  118.65    0.766  0.30( 0.29) 0.97   49369.2   11350.00
      1    41908.43  123.31    0.754  0.30( 0.29) 0.97   52542.3   11130.00
      1    41428.61  129.43    0.741  0.30( 0.29) 0.97   55469.5   12300.00
      1    40562.06  138.30    0.722  0.30( 0.29) 0.97   59730.0   12400.00
      1    39431.33  147.94    0.701  0.30( 0.29) 0.97   63131.5   12201.00
      1    38399.89  155.54    0.685  0.30( 0.29) 0.97   65024.1   12231.00
      1    37330.96  163.16    0.668  0.30( 0.29) 0.97   66578.1   10400.00
      1    35693.76  172.80    0.647  0.30( 0.29) 0.97   68023.3   12010.00
      1    34614.45  178.33    0.636  0.30( 0.29) 0.97   68286.9   10210.00
      1    30071.18  209.45    0.604  0.30( 0.29) 0.98   69046.6   10100.00
      2      146.34   15.77    2.324  0.30( 0.28) 0.94      79.6   13889.00
```



```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22850.27   15.77    2.324  0.30( 0.29) 0.95    3234.3   13889.00
      2    26028.24   26.78    1.656  0.30( 0.29) 0.95    5437.4   13810.00
      3    26383.32   28.11    1.601  0.30( 0.29) 0.95    5753.2   13850.00
      4    27195.08   31.21    1.499  0.30( 0.29) 0.96    6475.2   13870.00
      5    27233.31   31.36    1.496  0.30( 0.29) 0.96    6509.2   10300.00
      6    28778.10   37.78    1.366  0.30( 0.29) 0.96    8563.4   10400.00
      7    29191.23   39.39    1.333  0.30( 0.29) 0.96    9153.1   13830.00
      8    30405.29   44.41    1.254  0.30( 0.29) 0.96   10916.2   20700.00
      9    32298.38   52.73    1.135  0.30( 0.29) 0.97   14230.9   10100.00
     10    33973.29   60.21    1.042  0.30( 0.29) 0.97   17874.7   20300.00
     11    35678.47   72.63    0.971  0.30( 0.29) 0.96   24134.0   31400.00
     12    36826.00   83.53    0.910  0.30( 0.29) 0.96   29621.7   13100.00
     13    37694.88   90.02    0.873  0.30( 0.29) 0.96   32494.4   11801.00
     14    39360.75  100.42    0.834  0.30( 0.29) 0.96   37812.3   11530.00
     15    39974.85  105.87    0.814  0.30( 0.29) 0.97   41306.8   13510.00
     16    41618.68  118.65    0.766  0.30( 0.29) 0.97   49448.8   11350.00
     17    41942.29  123.31    0.754  0.30( 0.29) 0.97   52621.9   11130.00
     18    41461.53  129.43    0.741  0.30( 0.29) 0.97   55549.1   12300.00
     19    40593.61  138.30    0.722  0.30( 0.29) 0.97   59809.7   12400.00
     20    39461.39  147.94    0.701  0.30( 0.29) 0.97   63211.1   12201.00
     21    38428.79  155.54    0.685  0.30( 0.29) 0.97   65103.7   12231.00
     22    37358.68  163.16    0.668  0.30( 0.29) 0.97   66657.7   10400.00
     23    35720.00  172.80    0.647  0.30( 0.29) 0.97   68103.0   12010.00
     24    34639.83  178.33    0.636  0.30( 0.29) 0.97   68366.5   10210.00
     25    30094.32  209.45    0.604  0.30( 0.29) 0.98   69126.2   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   41942.29    Tc(MIN.) =   123.31
  EFFECTIVE AREA(ACRES) =   52621.93   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    69126.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13910.00 =  135259.69 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    69126.2  TC(MIN.) =    123.31
  EFFECTIVE AREA(ACRES) =  52621.93  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.971
  PEAK FLOW RATE(CFS)   =   41942.29

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22850.27   15.77    2.324  0.30( 0.29) 0.95    3234.3   13889.00
      2    26028.24   26.78    1.656  0.30( 0.29) 0.95    5437.4   13810.00
      3    26383.32   28.11    1.601  0.30( 0.29) 0.95    5753.2   13850.00
      4    27195.08   31.21    1.499  0.30( 0.29) 0.96    6475.2   13870.00
      5    27233.31   31.36    1.496  0.30( 0.29) 0.96    6509.2   10300.00
      6    28778.10   37.78    1.366  0.30( 0.29) 0.96    8563.4   10400.00
      7    29191.23   39.39    1.333  0.30( 0.29) 0.96    9153.1   13830.00
      8    30405.29   44.41    1.254  0.30( 0.29) 0.96   10916.2   20700.00
      9    32298.38   52.73    1.135  0.30( 0.29) 0.97   14230.9   10100.00
     10    33973.29   60.21    1.042  0.30( 0.29) 0.97   17874.7   20300.00
```

11	35678.47	72.63	0.971	0.30(0.29)	0.96	24134.0	31400.00
12	36826.00	83.53	0.910	0.30(0.29)	0.96	29621.7	13100.00
13	37694.88	90.02	0.873	0.30(0.29)	0.96	32494.4	11801.00
14	39360.75	100.42	0.834	0.30(0.29)	0.96	37812.3	11530.00
15	39974.85	105.87	0.814	0.30(0.29)	0.97	41306.8	13510.00
16	41618.68	118.65	0.766	0.30(0.29)	0.97	49448.8	11350.00
17	41942.29	123.31	0.754	0.30(0.29)	0.97	52621.9	11130.00
18	41461.53	129.43	0.741	0.30(0.29)	0.97	55549.1	12300.00
19	40593.61	138.30	0.722	0.30(0.29)	0.97	59809.7	12400.00
20	39461.39	147.94	0.701	0.30(0.29)	0.97	63211.1	12201.00
21	38428.79	155.54	0.685	0.30(0.29)	0.97	65103.7	12231.00
22	37358.68	163.16	0.668	0.30(0.29)	0.97	66657.7	10400.00
23	35720.00	172.80	0.647	0.30(0.29)	0.97	68103.0	12010.00
24	34639.83	178.33	0.636	0.30(0.29)	0.97	68366.5	10210.00
25	30094.32	209.45	0.604	0.30(0.29)	0.98	69126.2	10100.00

END OF RATIONAL METHOD ANALYSIS

```
******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




------------------------------------------------------------------------------
  FILE NAME: S39.DAT
  TIME/DATE OF STUDY: 09:38 09/12/2017
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.736
   2)   10.00;  3.102
   3)   15.00;  2.384
   4)   20.00;  1.980
   5)   25.00;  1.729
   6)   30.00;  1.522
   7)   40.00;  1.321
   8)   50.00;  1.169
   9)   60.00;  1.042
  10)   90.00;  0.872
  11)  120.00;  0.761
  12)  180.00;  0.631
  13)  360.00;  0.462
  14) 1440.00;  0.201
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
******************************************************************************
  FLOW PROCESS FROM NODE  13900.00 TO NODE  13901.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   600.65
  ELEVATION DATA: UPSTREAM(FEET) =    442.40  DOWNSTREAM(FEET) =    385.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.859
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.979
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  AGRICULTURAL POOR COVER
  "FALLOW"                  -        4.00      0.30     1.000      0   10.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.64
  TOTAL AREA(ACRES) =      4.00   PEAK FLOW RATE(CFS) =      9.64

******************************************************************************
  FLOW PROCESS FROM NODE  13901.00 TO NODE  13902.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    385.16  DOWNSTREAM(FEET) =    288.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   647.42   CHANNEL SLOPE =  0.1497
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.30
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.725
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        8.47      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.77
  Tc(MIN.) =   12.63
  SUBAREA AREA(ACRES) =     8.47       SUBAREA RUNOFF(CFS) =   18.48
  EFFECTIVE AREA(ACRES) =     12.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.5          PEAK FLOW RATE(CFS) =      27.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   6.98
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13902.00 =    1248.07 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  13902.00 TO NODE  13903.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.21  DOWNSTREAM(FEET) =    184.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   669.27   CHANNEL SLOPE =  0.1544
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.544
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.85      0.30     0.982     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.982
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.88
  AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   1.26
  Tc(MIN.) =   13.88
  SUBAREA AREA(ACRES) =    23.85       SUBAREA RUNOFF(CFS) =   48.29
  EFFECTIVE AREA(ACRES) =     36.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       36.3         PEAK FLOW RATE(CFS) =      73.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   9.98
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13903.00 =    1917.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   184.89  DOWNSTREAM(FEET) =   155.08
  FLOW LENGTH(FEET) =   876.66   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  20.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.45
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      73.48
  PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =   14.72
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13904.00 =    2794.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.72
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.424
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       21.29      0.30     0.996     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.996
  SUBAREA AREA(ACRES) =   21.29      SUBAREA RUNOFF(CFS) =   40.72
  EFFECTIVE AREA(ACRES) =     57.61   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =       57.6       PEAK FLOW RATE(CFS) =     110.27

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.08  DOWNSTREAM(FEET) =   118.00
  FLOW LENGTH(FEET) =  1961.38   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.28
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     110.27
  PIPE TRAVEL TIME(MIN.) =   2.14    Tc(MIN.) =   16.86
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.234
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.53      0.30     0.649     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.649
  SUBAREA AREA(ACRES) =   43.53      SUBAREA RUNOFF(CFS) =   79.88
  EFFECTIVE AREA(ACRES) =    101.14   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =      101.1       PEAK FLOW RATE(CFS) =     180.28

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S38.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    22850.27   15.77  0.30( 0.29) 0.95    3234.3   13889.00
      2    27233.31   31.36  0.30( 0.29) 0.96    6509.2   10300.00
```

```
      3    29191.23   39.39  0.30( 0.29) 0.96    9153.1   13830.00
      4    30405.29   44.41  0.30( 0.29) 0.96   10916.2   20700.00
      5    32298.38   52.73  0.30( 0.29) 0.97   14230.9   10100.00
      6    33973.29   60.21  0.30( 0.29) 0.97   17874.7   20300.00
      7    35678.47   72.63  0.30( 0.29) 0.96   24134.0   31400.00
      8    36826.00   83.53  0.30( 0.29) 0.96   29621.7   13100.00
      9    37694.88   90.02  0.30( 0.29) 0.96   32494.4   11801.00
     10    39360.75  100.42  0.30( 0.29) 0.96   37812.3   11530.00
     11    39974.85  105.87  0.30( 0.29) 0.97   41306.8   13510.00
     12    41942.29  123.31  0.30( 0.29) 0.97   52621.9   11130.00
     13    41461.53  129.43  0.30( 0.29) 0.97   55549.1   12300.00
     14    40593.61  138.30  0.30( 0.29) 0.97   59809.7   12400.00
     15    39461.39  147.94  0.30( 0.29) 0.97   63211.1   12201.00
     16    38428.79  155.54  0.30( 0.29) 0.97   65103.7   12231.00
     17    37358.68  163.16  0.30( 0.29) 0.97   66657.7   10400.00
     18    35720.00  172.80  0.30( 0.29) 0.97   68103.0   12010.00
     19    34639.83  178.33  0.30( 0.29) 0.97   68366.5   10210.00
     20    30094.32  209.45  0.30( 0.29) 0.98   69126.2   10100.00
    TOTAL AREA(ACRES) =    69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    22850.27   15.77  0.30( 0.29) 0.95    3234.3   13889.00
      2    27233.31   31.36  0.30( 0.29) 0.96    6509.2   10300.00
      3    29191.23   39.39  0.30( 0.29) 0.96    9153.1   13830.00
      4    30405.29   44.41  0.30( 0.29) 0.96   10916.2   20700.00
      5    32298.38   52.73  0.30( 0.29) 0.97   14230.9   10100.00
      6    33973.29   60.21  0.30( 0.29) 0.97   17874.7   20300.00
      7    35678.47   72.63  0.30( 0.29) 0.96   24134.0   31400.00
      8    36826.00   83.53  0.30( 0.29) 0.96   29621.7   13100.00
      9    37694.88   90.02  0.30( 0.29) 0.96   32494.4   11801.00
     10    39360.75  100.42  0.30( 0.29) 0.96   37812.3   11530.00
     11    39974.85  105.87  0.30( 0.29) 0.97   41306.8   13510.00
     12    41942.29  123.31  0.30( 0.29) 0.97   52621.9   11130.00
     13    41461.53  129.43  0.30( 0.29) 0.97   55549.1   12300.00
     14    40593.61  138.30  0.30( 0.29) 0.97   59809.7   12400.00
     15    39461.39  147.94  0.30( 0.29) 0.97   63211.1   12201.00
     16    38428.79  155.54  0.30( 0.29) 0.97   65103.7   12231.00
     17    37358.68  163.16  0.30( 0.29) 0.97   66657.7   10400.00
     18    35720.00  172.80  0.30( 0.29) 0.97   68103.0   12010.00
     19    34639.83  178.33  0.30( 0.29) 0.97   68366.5   10210.00
     20    30094.32  209.45  0.30( 0.29) 0.98   69126.2   10100.00
    TOTAL AREA(ACRES) =     69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    119.70  DOWNSTREAM(FEET) =    118.00
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1376.26   CHANNEL SLOPE =  0.0012
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  21.69
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.749
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.09      0.30     0.535     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.535
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   41967.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.36
  AVERAGE FLOW DEPTH(FEET) =  21.69   TRAVEL TIME(MIN.) =   2.21
  Tc(MIN.) =  125.52
  SUBAREA AREA(ACRES) =    96.09       SUBAREA RUNOFF(CFS) =   50.90
  EFFECTIVE AREA(ACRES) =  52718.02     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69222.3         PEAK FLOW RATE(CFS) =   41942.29
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  21.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 21.68   FLOW VELOCITY(FEET/SEC.) =  10.36
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22850.27   18.39    2.110  0.30( 0.28) 0.94    3330.4   13889.00
      2    27233.31   33.85    1.445  0.30( 0.28) 0.95    6605.3   10300.00
      3    29191.23   41.83    1.293  0.30( 0.29) 0.96    9249.2   13830.00
      4    30405.29   46.83    1.217  0.30( 0.29) 0.96   11012.3   20700.00
      5    32298.38   55.11    1.104  0.30( 0.29) 0.96   14327.0   10100.00
      6    33973.29   62.55    1.028  0.30( 0.29) 0.96   17970.8   20300.00
      7    35678.47   74.95    0.957  0.30( 0.29) 0.96   24230.1   31400.00
      8    36826.00   85.82    0.896  0.30( 0.29) 0.96   29717.8   13100.00
      9    37694.88   92.29    0.864  0.30( 0.29) 0.96   32590.5   11801.00
     10    39360.75  102.67    0.825  0.30( 0.29) 0.96   37908.4   11530.00
     11    39974.85  108.11    0.805  0.30( 0.29) 0.96   41402.9   13510.00
     12    41942.29  125.52    0.749  0.30( 0.29) 0.97   52718.0   11130.00
     13    41461.53  131.65    0.736  0.30( 0.29) 0.97   55645.2   12300.00
     14    40593.61  140.53    0.717  0.30( 0.29) 0.97   59905.8   12400.00
     15    39461.39  150.19    0.696  0.30( 0.29) 0.97   63307.2   12201.00
     16    38428.79  157.81    0.679  0.30( 0.29) 0.97   65199.8   12231.00
     17    37358.68  165.44    0.663  0.30( 0.29) 0.97   66753.8   10400.00
     18    35720.00  175.11    0.642  0.30( 0.29) 0.97   68199.1   12010.00
     19    34639.83  180.67    0.630  0.30( 0.29) 0.97   68462.6   10210.00
     20    30094.32  211.87    0.601  0.30( 0.29) 0.97   69222.3   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41942.29  Tc(MIN.) =  125.52
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   52718.02

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  11
```

```
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22850.27   18.39    2.110  0.30( 0.28) 0.94    3330.4   13889.00
      2    27233.31   33.85    1.445  0.30( 0.28) 0.95    6605.3   10300.00
      3    29191.23   41.83    1.293  0.30( 0.29) 0.96    9249.2   13830.00
      4    30405.29   46.83    1.217  0.30( 0.29) 0.96   11012.3   20700.00
      5    32298.38   55.11    1.104  0.30( 0.29) 0.96   14327.0   10100.00
      6    33973.29   62.55    1.028  0.30( 0.29) 0.96   17970.8   20300.00
      7    35678.47   74.95    0.957  0.30( 0.29) 0.96   24230.1   31400.00
      8    36826.00   85.82    0.896  0.30( 0.29) 0.96   29717.8   13100.00
      9    37694.88   92.29    0.864  0.30( 0.29) 0.96   32590.5   11801.00
     10    39360.75  102.67    0.825  0.30( 0.29) 0.96   37908.4   11530.00
     11    39974.85  108.11    0.805  0.30( 0.29) 0.96   41402.9   13510.00
     12    41942.29  125.52    0.749  0.30( 0.29) 0.97   52718.0   11130.00
     13    41461.53  131.65    0.736  0.30( 0.29) 0.97   55645.2   12300.00
     14    40593.61  140.53    0.717  0.30( 0.29) 0.97   59905.8   12400.00
     15    39461.39  150.19    0.696  0.30( 0.29) 0.97   63307.2   12201.00
     16    38428.79  157.81    0.679  0.30( 0.29) 0.97   65199.8   12231.00
     17    37358.68  165.44    0.663  0.30( 0.29) 0.97   66753.8   10400.00
     18    35720.00  175.11    0.642  0.30( 0.29) 0.97   68199.1   12010.00
     19    34639.83  180.67    0.630  0.30( 0.29) 0.97   68462.6   10210.00
     20    30094.32  211.87    0.601  0.30( 0.29) 0.97   69222.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      180.28   16.86    2.234  0.30( 0.25) 0.84     101.1   13900.00
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22547.06   16.86    2.234  0.30( 0.28) 0.94    3155.0   13900.00
      2    23019.32   18.39    2.110  0.30( 0.28) 0.94    3431.5   13889.00
      3    27341.77   33.85    1.445  0.30( 0.28) 0.95    6706.5   10300.00
      4    29285.90   41.83    1.293  0.30( 0.29) 0.96    9350.3   13830.00
      5    30493.05   46.83    1.217  0.30( 0.29) 0.96   11113.4   20700.00
      6    32375.84   55.11    1.104  0.30( 0.29) 0.96   14428.2   10100.00
      7    34043.79   62.55    1.028  0.30( 0.29) 0.96   18072.0   20300.00
      8    35742.57   74.95    0.957  0.30( 0.29) 0.96   24331.2   31400.00
      9    36884.49   85.82    0.896  0.30( 0.29) 0.96   29818.9   13100.00
     10    37750.44   92.29    0.864  0.30( 0.29) 0.96   32691.6   11801.00
     11    39412.82  102.67    0.825  0.30( 0.29) 0.96   38009.6   11530.00
     12    40025.09  108.11    0.805  0.30( 0.29) 0.96   41504.0   13510.00
     13    41987.44  125.52    0.749  0.30( 0.29) 0.97   52819.2   11130.00
     14    41505.46  131.65    0.736  0.30( 0.29) 0.97   55746.3   12300.00
     15    40635.80  140.53    0.717  0.30( 0.29) 0.97   60006.9   12400.00
     16    39501.67  150.19    0.696  0.30( 0.29) 0.97   63408.3   12201.00
     17    38467.57  157.81    0.679  0.30( 0.29) 0.97   65300.9   12231.00
     18    37395.95  165.44    0.663  0.30( 0.29) 0.97   66854.9   10400.00
     19    35755.36  175.11    0.642  0.30( 0.29) 0.97   68300.2   12010.00
     20    34674.18  180.67    0.630  0.30( 0.29) 0.97   68563.8   10210.00
```



```
     21    30125.99  211.87    0.601  0.30( 0.29) 0.97   69323.4   10100.00
    TOTAL AREA(ACRES) =     69323.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    41987.44  Tc(MIN.) =  125.521
  EFFECTIVE AREA(ACRES) =  52819.16  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =    69323.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13920.00 TO NODE  13921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    118.00  DOWNSTREAM(FEET) =    115.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.44   CHANNEL SLOPE =  0.0081
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.41
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.748
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      134.30      0.30     0.658     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.658
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   42020.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.40
  AVERAGE FLOW DEPTH(FEET) =  13.41   TRAVEL TIME(MIN.) =   0.27
  Tc(MIN.) =  125.80
  SUBAREA AREA(ACRES) =   134.30       SUBAREA RUNOFF(CFS) =   66.61
  EFFECTIVE AREA(ACRES) =  52953.46     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69457.7         PEAK FLOW RATE(CFS) =   41987.44
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.40   FLOW VELOCITY(FEET/SEC.) =  20.40
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13921.00 =  136971.39 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22547.06   17.19    2.207  0.30( 0.28) 0.93    3289.3   13900.00
      2    23019.32   18.71    2.084  0.30( 0.28) 0.93    3565.8   13889.00
      3    27341.77   34.16    1.438  0.30( 0.28) 0.94    6840.8   10300.00
      4    29285.90   42.14    1.289  0.30( 0.29) 0.95    9484.6   13830.00
      5    30493.05   47.13    1.213  0.30( 0.29) 0.96   11247.7   20700.00
      6    32375.84   55.41    1.100  0.30( 0.29) 0.96   14562.5   10100.00
      7    34043.79   62.84    1.026  0.30( 0.29) 0.96   18206.3   20300.00
      8    35742.57   75.23    0.956  0.30( 0.29) 0.96   24465.5   31400.00
      9    36884.49   86.11    0.894  0.30( 0.29) 0.96   29953.2   13100.00
     10    37750.44   92.58    0.862  0.30( 0.29) 0.96   32825.9   11801.00
```

```
    11    39412.82  102.95    0.824  0.30( 0.29) 0.96   38143.9   11530.00
    12    40025.09  108.39    0.804  0.30( 0.29) 0.96   41638.3   13510.00
    13    41987.44  125.80    0.748  0.30( 0.29) 0.97   52953.5   11130.00
    14    41505.46  131.93    0.735  0.30( 0.29) 0.97   55880.6   12300.00
    15    40635.80  140.81    0.716  0.30( 0.29) 0.97   60141.2   12400.00
    16    39501.67  150.47    0.695  0.30( 0.29) 0.97   63542.6   12201.00
    17    38467.57  158.09    0.678  0.30( 0.29) 0.97   65435.2   12231.00
    18    37395.95  165.73    0.662  0.30( 0.29) 0.97   66989.2   10400.00
    19    35755.36  175.40    0.641  0.30( 0.29) 0.97   68434.5   12010.00
    20    34674.18  180.95    0.630  0.30( 0.29) 0.97   68698.1   10210.00
    21    30125.99  212.17    0.601  0.30( 0.29) 0.97   69457.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41987.44  Tc(MIN.) =  125.80
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   52953.46

****************************************************************************
  FLOW PROCESS FROM NODE  13921.00 TO NODE  14010.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    115.28  DOWNSTREAM(FEET) =    100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1396.08   CHANNEL SLOPE =  0.0109
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.39
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.746
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.27      0.30     0.723     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.723
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   42010.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  22.70
  AVERAGE FLOW DEPTH(FEET) =  12.38   TRAVEL TIME(MIN.) =   1.03
  Tc(MIN.) =  126.82
  SUBAREA AREA(ACRES) =    96.27       SUBAREA RUNOFF(CFS) =   45.87
  EFFECTIVE AREA(ACRES) =  53049.73     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69554.0         PEAK FLOW RATE(CFS) =   41987.44
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.38   FLOW VELOCITY(FEET/SEC.) =  22.69
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  14010.00 =  138367.47 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22547.06   18.42    2.107  0.30( 0.28) 0.92    3385.6   13900.00
      2    23019.32   19.94    1.985  0.30( 0.28) 0.92    3662.1   13889.00
      3    27341.77   35.32    1.415  0.30( 0.28) 0.94    6937.0   10300.00
      4    29285.90   43.28    1.271  0.30( 0.28) 0.95    9580.9   13830.00
```



```
      5    30493.05   48.26    1.196  0.30( 0.29) 0.95   11344.0   20700.00
      6    32375.84   56.51    1.086  0.30( 0.29) 0.96   14658.7   10100.00
      7    34043.79   63.93    1.020  0.30( 0.29) 0.96   18302.5   20300.00
      8    35742.57   76.31    0.950  0.30( 0.29) 0.96   24561.8   31400.00
      9    36884.49   87.17    0.888  0.30( 0.29) 0.96   30049.5   13100.00
     10    37750.44   93.63    0.859  0.30( 0.29) 0.96   32922.2   11801.00
     11    39412.82  103.99    0.820  0.30( 0.29) 0.96   38240.1   11530.00
     12    40025.09  109.43    0.800  0.30( 0.29) 0.96   41734.6   13510.00
     13    41987.44  126.82    0.746  0.30( 0.29) 0.97   53049.7   11130.00
     14    41505.46  132.96    0.733  0.30( 0.29) 0.97   55976.9   12300.00
     15    40635.80  141.84    0.714  0.30( 0.29) 0.97   60237.5   12400.00
     16    39501.67  151.51    0.693  0.30( 0.29) 0.97   63638.9   12201.00
     17    38467.57  159.14    0.676  0.30( 0.29) 0.97   65531.5   12231.00
     18    37395.95  166.79    0.660  0.30( 0.29) 0.97   67085.5   10400.00
     19    35755.36  176.47    0.639  0.30( 0.29) 0.97   68530.8   12010.00
     20    34674.18  182.04    0.629  0.30( 0.29) 0.97   68794.4   10210.00
     21    30125.99  213.30    0.600  0.30( 0.29) 0.97   69554.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41987.44  Tc(MIN.) =  126.82
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   53049.73
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    69554.0  TC(MIN.) =    126.82
  EFFECTIVE AREA(ACRES) =  53049.73  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.969
  PEAK FLOW RATE(CFS)   =   41987.44

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22547.06   18.42    2.107  0.30( 0.28) 0.92    3385.6   13900.00
      2    23019.32   19.94    1.985  0.30( 0.28) 0.92    3662.1   13889.00
      3    27341.77   35.32    1.415  0.30( 0.28) 0.94    6937.0   10300.00
      4    29285.90   43.28    1.271  0.30( 0.28) 0.95    9580.9   13830.00
      5    30493.05   48.26    1.196  0.30( 0.29) 0.95   11344.0   20700.00
      6    32375.84   56.51    1.086  0.30( 0.29) 0.96   14658.7   10100.00
      7    34043.79   63.93    1.020  0.30( 0.29) 0.96   18302.5   20300.00
      8    35742.57   76.31    0.950  0.30( 0.29) 0.96   24561.8   31400.00
      9    36884.49   87.17    0.888  0.30( 0.29) 0.96   30049.5   13100.00
     10    37750.44   93.63    0.859  0.30( 0.29) 0.96   32922.2   11801.00
     11    39412.82  103.99    0.820  0.30( 0.29) 0.96   38240.1   11530.00
     12    40025.09  109.43    0.800  0.30( 0.29) 0.96   41734.6   13510.00
     13    41987.44  126.82    0.746  0.30( 0.29) 0.97   53049.7   11130.00
     14    41505.46  132.96    0.733  0.30( 0.29) 0.97   55976.9   12300.00
     15    40635.80  141.84    0.714  0.30( 0.29) 0.97   60237.5   12400.00
     16    39501.67  151.51    0.693  0.30( 0.29) 0.97   63638.9   12201.00
     17    38467.57  159.14    0.676  0.30( 0.29) 0.97   65531.5   12231.00
     18    37395.95  166.79    0.660  0.30( 0.29) 0.97   67085.5   10400.00
     19    35755.36  176.47    0.639  0.30( 0.29) 0.97   68530.8   12010.00
     20    34674.18  182.04    0.629  0.30( 0.29) 0.97   68794.4   10210.00
     21    30125.99  213.30    0.600  0.30( 0.29) 0.97   69554.0   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S1.DAT
  TIME/DATE OF STUDY: 10:05 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.622
   2)   10.00;  4.044
   3)   15.00;  2.993
   4)   20.00;  2.461
   5)   25.00;  2.087
   6)   30.00;  1.887
   7)   40.00;  1.580
   8)   50.00;  1.420
   9)   60.00;  1.366
  10)   90.00;  1.157
  11)  120.00;  1.027
  12)  180.00;  0.925
  13)  360.00;  0.719
  14) 1440.00;  0.327
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10100.00 TO NODE  10101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   934.06
  ELEVATION DATA: UPSTREAM(FEET) =   3351.52  DOWNSTREAM(FEET) =   3172.56

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.977
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        3.55      0.30     1.000     0   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.55
  TOTAL AREA(ACRES) =      3.55   PEAK FLOW RATE(CFS) =      8.55

**************************************************************************
  FLOW PROCESS FROM NODE  10101.00 TO NODE  10102.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3172.56  DOWNSTREAM(FEET) =   3090.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   942.40   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.60
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.612
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       19.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.59
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   3.43
  Tc(MIN.) =   18.58
  SUBAREA AREA(ACRES) =    19.22       SUBAREA RUNOFF(CFS) =   40.00
  EFFECTIVE AREA(ACRES) =     22.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.8          PEAK FLOW RATE(CFS) =      47.39
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.75   FLOW VELOCITY(FEET/SEC.) =   5.47
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10102.00 =    1876.46 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10102.00 TO NODE  10103.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3090.55  DOWNSTREAM(FEET) =   3022.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   920.65   CHANNEL SLOPE =  0.0740
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.371
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      67.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.85
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   2.62
  Tc(MIN.) =   21.20
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   40.12
  EFFECTIVE AREA(ACRES) =     44.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       44.3         PEAK FLOW RATE(CFS) =      82.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.09   FLOW VELOCITY(FEET/SEC.) =   6.23
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10103.00 =    2797.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10103.00 TO NODE  10104.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3022.44  DOWNSTREAM(FEET) =   2962.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.87   CHANNEL SLOPE =  0.0612
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.89
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.211
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      126.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     191.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.61
  AVERAGE FLOW DEPTH(FEET) =   1.84   TRAVEL TIME(MIN.) =   2.14
  Tc(MIN.) =   23.34
  SUBAREA AREA(ACRES) =   126.78       SUBAREA RUNOFF(CFS) =  218.07
  EFFECTIVE AREA(ACRES) =    171.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.1         PEAK FLOW RATE(CFS) =     294.25
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.32   FLOW VELOCITY(FEET/SEC.) =   8.64
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10104.00 =    3774.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10104.00 TO NODE  10105.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.57  DOWNSTREAM(FEET) =   2917.85
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.94   CHANNEL SLOPE =  0.0240
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.46
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.965
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.68      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     378.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.62
  AVERAGE FLOW DEPTH(FEET) =   3.41   TRAVEL TIME(MIN.) =   4.70
  Tc(MIN.) =   28.04
  SUBAREA AREA(ACRES) =   112.68       SUBAREA RUNOFF(CFS) =  168.90
  EFFECTIVE AREA(ACRES) =    283.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      283.8         PEAK FLOW RATE(CFS) =     425.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.61   FLOW VELOCITY(FEET/SEC.) =   6.83
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.00 =    5639.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.00 TO NODE  10105.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2917.85  DOWNSTREAM(FEET) =   2880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1406.97   CHANNEL SLOPE =  0.0269
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.05
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.853
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      183.39      0.30     1.000     -
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     553.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.66
  AVERAGE FLOW DEPTH(FEET) =   4.01   TRAVEL TIME(MIN.) =   3.06
  Tc(MIN.) =   31.10
  SUBAREA AREA(ACRES) =   183.39       SUBAREA RUNOFF(CFS) =  256.37
  EFFECTIVE AREA(ACRES) =    467.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      467.1          PEAK FLOW RATE(CFS) =     653.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.36   FLOW VELOCITY(FEET/SEC.) =   8.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.50 =    7046.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.50 TO NODE  10106.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2880.00  DOWNSTREAM(FEET) =   2868.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1701.11   CHANNEL SLOPE =  0.0070
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.24
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.677
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     690.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.95
  AVERAGE FLOW DEPTH(FEET) =   6.22   TRAVEL TIME(MIN.) =   5.73
  Tc(MIN.) =   36.83
  SUBAREA AREA(ACRES) =    60.63       SUBAREA RUNOFF(CFS) =   75.16
  EFFECTIVE AREA(ACRES) =    527.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      527.8          PEAK FLOW RATE(CFS) =     654.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.06   FLOW VELOCITY(FEET/SEC.) =   4.88
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10106.00 =    8748.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10106.00 TO NODE  10107.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   2868.10  DOWNSTREAM(FEET) =   2781.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2951.00   CHANNEL SLOPE =  0.0294
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.51
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.538
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     722.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.50
  AVERAGE FLOW DEPTH(FEET) =   4.48   TRAVEL TIME(MIN.) =   5.79
  Tc(MIN.) =   42.62
  SUBAREA AREA(ACRES) =   123.11       SUBAREA RUNOFF(CFS) =  137.19
  EFFECTIVE AREA(ACRES) =    650.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.9          PEAK FLOW RATE(CFS) =     725.32
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.49   FLOW VELOCITY(FEET/SEC.) =   8.51
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10107.00 =   11699.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10107.00 TO NODE  10108.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2781.28  DOWNSTREAM(FEET) =   2725.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2630.56   CHANNEL SLOPE =  0.0213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.19
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.448
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      186.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     821.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.82
  AVERAGE FLOW DEPTH(FEET) =   5.17   TRAVEL TIME(MIN.) =   5.61
  Tc(MIN.) =   48.23
  SUBAREA AREA(ACRES) =   186.62       SUBAREA RUNOFF(CFS) =  192.89
  EFFECTIVE AREA(ACRES) =    837.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      837.5          PEAK FLOW RATE(CFS) =     865.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.31
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.31   FLOW VELOCITY(FEET/SEC.) =   7.92
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10108.00 =   14329.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10108.00 TO NODE  10109.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2725.20  DOWNSTREAM(FEET) =   2581.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2890.52   CHANNEL SLOPE =  0.0496
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.45
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.406
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     921.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.98
  AVERAGE FLOW DEPTH(FEET) =   4.44   TRAVEL TIME(MIN.) =   4.39
  Tc(MIN.) =   52.61
  SUBAREA AREA(ACRES) =   112.07       SUBAREA RUNOFF(CFS) =  111.55
  EFFECTIVE AREA(ACRES) =    949.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      949.6         PEAK FLOW RATE(CFS) =     945.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.50   FLOW VELOCITY(FEET/SEC.) =  11.06
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10109.00 =   17220.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10109.00 TO NODE  10110.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.72  DOWNSTREAM(FEET) =   2367.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2877.15   CHANNEL SLOPE =  0.0744
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.22
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.386
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1016.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.08
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  AVERAGE FLOW DEPTH(FEET) =   4.22   TRAVEL TIME(MIN.) =   3.67
  Tc(MIN.) =   56.28
  SUBAREA AREA(ACRES) =   145.21       SUBAREA RUNOFF(CFS) =  141.95
  EFFECTIVE AREA(ACRES) =   1094.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1094.8         PEAK FLOW RATE(CFS) =    1070.18
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.33   FLOW VELOCITY(FEET/SEC.) =  13.25
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10110.00 =   20097.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10110.00 TO NODE  10111.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2367.59  DOWNSTREAM(FEET) =   2075.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2802.04   CHANNEL SLOPE =  0.1041
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.28
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.370
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1233.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.58
  AVERAGE FLOW DEPTH(FEET) =   4.27   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =   59.28
  SUBAREA AREA(ACRES) =   339.01       SUBAREA RUNOFF(CFS) =  326.45
  EFFECTIVE AREA(ACRES) =   1433.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1433.8         PEAK FLOW RATE(CFS) =    1380.69
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.52   FLOW VELOCITY(FEET/SEC.) =  16.05
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10111.00 =   22899.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10111.00 TO NODE  10112.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2075.82  DOWNSTREAM(FEET) =   2004.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3782.59   CHANNEL SLOPE =  0.0190
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.11
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.321
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      265.32      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1502.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.76
  AVERAGE FLOW DEPTH(FEET) =   7.09   TRAVEL TIME(MIN.) =   7.20
  Tc(MIN.) =   66.48
  SUBAREA AREA(ACRES) =   265.32       SUBAREA RUNOFF(CFS) =  243.79
  EFFECTIVE AREA(ACRES) =   1699.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1699.1         PEAK FLOW RATE(CFS) =    1561.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.22   FLOW VELOCITY(FEET/SEC.) =   8.84
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.00 =   26681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10112.00 TO NODE  10112.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.03  DOWNSTREAM(FEET) =   1982.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1479.53   CHANNEL SLOPE =  0.0149
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.95
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.300
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      307.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1699.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.25
  AVERAGE FLOW DEPTH(FEET) =   7.95   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   69.46
  SUBAREA AREA(ACRES) =   307.63       SUBAREA RUNOFF(CFS) =  276.90
  EFFECTIVE AREA(ACRES) =   2006.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.7         PEAK FLOW RATE(CFS) =    1806.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.18   FLOW VELOCITY(FEET/SEC.) =   8.38
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.50 =   28161.39 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1982.04  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3416.13   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.10
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.255
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1861.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.77
  AVERAGE FLOW DEPTH(FEET) =   8.10   TRAVEL TIME(MIN.) =   6.49
  Tc(MIN.) =   75.95
  SUBAREA AREA(ACRES) =   127.40       SUBAREA RUNOFF(CFS) =  109.49
  EFFECTIVE AREA(ACRES) =   2134.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2134.1         PEAK FLOW RATE(CFS) =    1834.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.04   FLOW VELOCITY(FEET/SEC.) =   8.74
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     2134.1  TC(MIN.) =     75.95
  EFFECTIVE AREA(ACRES) =   2134.14  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    1834.14
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S2.DAT
  TIME/DATE OF STUDY: 10:05 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.643
   2)   10.00;  4.054
   3)   15.00;  2.999
   4)   20.00;  2.465
   5)   25.00;  2.089
   6)   30.00;  1.890
   7)   40.00;  1.583
   8)   50.00;  1.422
   9)   60.00;  1.369
  10)   90.00;  1.160
  11)  120.00;  1.030
  12)  180.00;  0.928
  13)  360.00;  0.723
  14) 1440.00;  0.328
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10200.00 TO NODE  10201.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   301.66
  ELEVATION DATA: UPSTREAM(FEET) =   3087.44  DOWNSTREAM(FEET) =   3031.53

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.206
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.09      0.30     1.000     0    9.71
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.83
  TOTAL AREA(ACRES) =      1.09   PEAK FLOW RATE(CFS) =      3.83

**************************************************************************
  FLOW PROCESS FROM NODE  10201.00 TO NODE  10202.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3031.53  DOWNSTREAM(FEET) =   2903.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   538.03   CHANNEL SLOPE =  0.2382
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.23
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.675
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.29
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   2.09
  Tc(MIN.) =   11.80
  SUBAREA AREA(ACRES) =     4.06       SUBAREA RUNOFF(CFS) =   12.33
  EFFECTIVE AREA(ACRES) =      5.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2          PEAK FLOW RATE(CFS) =      15.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   5.05
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10202.00 =     839.69 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10202.00 TO NODE  10203.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.38  DOWNSTREAM(FEET) =   2639.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1124.98   CHANNEL SLOPE =  0.2344
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.201
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.35
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =   14.04
  SUBAREA AREA(ACRES) =    36.13       SUBAREA RUNOFF(CFS) =   94.33
  EFFECTIVE AREA(ACRES) =     41.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.3         PEAK FLOW RATE(CFS) =     107.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =  10.01
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10203.00 =    1964.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10203.00 TO NODE  10204.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2639.65  DOWNSTREAM(FEET) =   2444.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.75   CHANNEL SLOPE =  0.1026
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.55
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.716
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     169.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.78
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =   3.60
  Tc(MIN.) =   17.65
  SUBAREA AREA(ACRES) =    56.14       SUBAREA RUNOFF(CFS) =  122.08
  EFFECTIVE AREA(ACRES) =     97.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =     211.85
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.69   FLOW VELOCITY(FEET/SEC.) =   9.38
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10204.00 =    3862.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10204.00 TO NODE  10205.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2444.90  DOWNSTREAM(FEET) =   2245.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1973.02   CHANNEL SLOPE =  0.1010
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.70
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.432
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      264.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     466.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.77
  AVERAGE FLOW DEPTH(FEET) =   2.60   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   20.44
  SUBAREA AREA(ACRES) =   264.47       SUBAREA RUNOFF(CFS) =  507.41
  EFFECTIVE AREA(ACRES) =    361.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      361.9         PEAK FLOW RATE(CFS) =     694.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.21   FLOW VELOCITY(FEET/SEC.) =  13.18
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10205.00 =    5835.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10205.00 TO NODE  10206.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2245.64  DOWNSTREAM(FEET) =   2157.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1870.92   CHANNEL SLOPE =  0.0469
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.55
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.213
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      255.55      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     914.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.74
  AVERAGE FLOW DEPTH(FEET) =   4.49   TRAVEL TIME(MIN.) =   2.90
  Tc(MIN.) =   23.35
  SUBAREA AREA(ACRES) =   255.55       SUBAREA RUNOFF(CFS) =  440.06
  EFFECTIVE AREA(ACRES) =    617.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      617.4          PEAK FLOW RATE(CFS) =    1063.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.83   FLOW VELOCITY(FEET/SEC.) =  11.18
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.00 =    7706.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.00 TO NODE  10206.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2157.91  DOWNSTREAM(FEET) =   2119.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1453.59   CHANNEL SLOPE =  0.0266
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.85
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.051
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1174.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.30
  AVERAGE FLOW DEPTH(FEET) =   5.83   TRAVEL TIME(MIN.) =   2.61
  Tc(MIN.) =   25.95
  SUBAREA AREA(ACRES) =   141.47       SUBAREA RUNOFF(CFS) =  222.96
  EFFECTIVE AREA(ACRES) =    758.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      758.9          PEAK FLOW RATE(CFS) =    1196.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.88   FLOW VELOCITY(FEET/SEC.) =   9.35
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.50 =    9159.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   2119.30  DOWNSTREAM(FEET) =   2093.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2020.48   CHANNEL SLOPE =  0.0129
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.20
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.872
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1270.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.27
  AVERAGE FLOW DEPTH(FEET) =   7.18   TRAVEL TIME(MIN.) =   4.63
  Tc(MIN.) =   30.58
  SUBAREA AREA(ACRES) =   105.39       SUBAREA RUNOFF(CFS) =  149.12
  EFFECTIVE AREA(ACRES) =    864.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      864.3          PEAK FLOW RATE(CFS) =    1222.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.05   FLOW VELOCITY(FEET/SEC.) =   7.19
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10220.00 =   11180.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.58
  RAINFALL INTENSITY(INCH/HR) =   1.87
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     864.30
  TOTAL STREAM AREA(ACRES) =     864.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1222.91

****************************************************************************
  FLOW PROCESS FROM NODE  10210.00 TO NODE  10211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   890.82
  ELEVATION DATA: UPSTREAM(FEET) =   2966.08  DOWNSTREAM(FEET) =   2867.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.601
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.828
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        7.25      0.30     1.000     0   16.60
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     16.50
  TOTAL AREA(ACRES) =      7.25   PEAK FLOW RATE(CFS) =     16.50

****************************************************************************
  FLOW PROCESS FROM NODE  10211.00 TO NODE  10212.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2867.74  DOWNSTREAM(FEET) =   2763.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1682.06   CHANNEL SLOPE =  0.0618
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.286
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       33.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.85
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   5.78
  Tc(MIN.) =   22.39
  SUBAREA AREA(ACRES) =    33.02       SUBAREA RUNOFF(CFS) =   59.01
  EFFECTIVE AREA(ACRES) =     40.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.3         PEAK FLOW RATE(CFS) =      71.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   5.62
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10212.00 =    2572.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10212.00 TO NODE  10213.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2763.75  DOWNSTREAM(FEET) =   2662.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1206.59   CHANNEL SLOPE =  0.0842
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.39
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.087
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       71.89      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     129.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.54
  AVERAGE FLOW DEPTH(FEET) =   1.36   TRAVEL TIME(MIN.) =   2.67
  Tc(MIN.) =   25.05
  SUBAREA AREA(ACRES) =    71.89       SUBAREA RUNOFF(CFS) =  115.62
  EFFECTIVE AREA(ACRES) =    112.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      112.2          PEAK FLOW RATE(CFS) =     180.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.63   FLOW VELOCITY(FEET/SEC.) =   8.35
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10213.00 =    3779.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10213.00 TO NODE  10214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2662.20  DOWNSTREAM(FEET) =   2520.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1783.17   CHANNEL SLOPE =  0.0793
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.30
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.964
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      182.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     317.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.66
  AVERAGE FLOW DEPTH(FEET) =   2.26   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   28.13
  SUBAREA AREA(ACRES) =   182.61       SUBAREA RUNOFF(CFS) =  273.56
  EFFECTIVE AREA(ACRES) =    294.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      294.8          PEAK FLOW RATE(CFS) =     441.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.70   FLOW VELOCITY(FEET/SEC.) =  10.63
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10214.00 =    5562.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10214.00 TO NODE  10215.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   2520.73  DOWNSTREAM(FEET) =   2270.71
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2774.20   CHANNEL SLOPE =  0.0901
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.96
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.828
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      156.94      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     549.50
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.84
 AVERAGE FLOW DEPTH(FEET) =   2.93   TRAVEL TIME(MIN.) =   3.90
 Tc(MIN.) =   32.03
 SUBAREA AREA(ACRES) =   156.94       SUBAREA RUNOFF(CFS) =  215.77
 EFFECTIVE AREA(ACRES) =    451.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      451.7          PEAK FLOW RATE(CFS) =     621.04
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.12

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.12   FLOW VELOCITY(FEET/SEC.) =  12.24
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10215.00 =    8336.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10215.00 TO NODE  10216.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2270.71  DOWNSTREAM(FEET) =   2151.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.75   CHANNEL SLOPE =  0.0592
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.73
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.733
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      130.62      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     705.27
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.90
 AVERAGE FLOW DEPTH(FEET) =   3.71   TRAVEL TIME(MIN.) =   3.09
 Tc(MIN.) =   35.12
 SUBAREA AREA(ACRES) =   130.62       SUBAREA RUNOFF(CFS) =  168.44
 EFFECTIVE AREA(ACRES) =    582.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      582.3          PEAK FLOW RATE(CFS) =     750.94
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.83
```



```
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.83   FLOW VELOCITY(FEET/SEC.) =  11.08
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.00 =   10356.59 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10216.00 TO NODE  10216.50 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2151.20  DOWNSTREAM(FEET) =   2120.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1242.42   CHANNEL SLOPE =  0.0246
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.88
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.655
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       51.25      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     782.19
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.13
 AVERAGE FLOW DEPTH(FEET) =   4.87   TRAVEL TIME(MIN.) =   2.55
 Tc(MIN.) =   37.67
 SUBAREA AREA(ACRES) =    51.25       SUBAREA RUNOFF(CFS) =   62.48
 EFFECTIVE AREA(ACRES) =    633.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      633.6          PEAK FLOW RATE(CFS) =     772.45
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.84   FLOW VELOCITY(FEET/SEC.) =   8.11
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.50 =   11599.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2120.63  DOWNSTREAM(FEET) =   2093.25
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1301.06   CHANNEL SLOPE =  0.0210
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.08
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.575
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       26.16      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     787.46
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.69
```

```
  AVERAGE FLOW DEPTH(FEET) =   5.08   TRAVEL TIME(MIN.) =   2.82
  Tc(MIN.) =   40.49
  SUBAREA AREA(ACRES) =    26.16       SUBAREA RUNOFF(CFS) =   30.02
  EFFECTIVE AREA(ACRES) =    659.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      659.7         PEAK FLOW RATE(CFS) =     772.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.03   FLOW VELOCITY(FEET/SEC.) =   7.65
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   40.49
  RAINFALL INTENSITY(INCH/HR) =   1.58
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     659.74
  TOTAL STREAM AREA(ACRES) =     659.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     772.45

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1222.91   30.58    1.872  0.30( 0.30) 1.00     864.3   10200.00
      2      772.45   40.49    1.575  0.30( 0.30) 1.00     659.7   10210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1942.29   30.58    1.872  0.30( 0.30) 1.00    1362.7   10200.00
      2     1764.41   40.49    1.575  0.30( 0.30) 1.00    1524.0   10210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1942.29    Tc(MIN.) =    30.58
  EFFECTIVE AREA(ACRES) =    1362.67   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1524.0
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10220.00 TO NODE  10221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2093.25  DOWNSTREAM(FEET) =   1965.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2966.11   CHANNEL SLOPE =  0.0430
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.72
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.753
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      104.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2010.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.79
  AVERAGE FLOW DEPTH(FEET) =   6.71   TRAVEL TIME(MIN.) =   3.86
  Tc(MIN.) =   34.45
  SUBAREA AREA(ACRES) =   104.45       SUBAREA RUNOFF(CFS) =  136.63
  EFFECTIVE AREA(ACRES) =   1467.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1628.5         PEAK FLOW RATE(CFS) =    1942.29
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.60   FLOW VELOCITY(FEET/SEC.) =  12.67
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.00 =   15866.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.00 TO NODE  10221.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1965.76  DOWNSTREAM(FEET) =   1950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1346.48   CHANNEL SLOPE =  0.0117
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.15
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.666
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      169.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2046.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.92
  AVERAGE FLOW DEPTH(FEET) =   9.14   TRAVEL TIME(MIN.) =   2.83
  Tc(MIN.) =   37.28
  SUBAREA AREA(ACRES) =   169.50       SUBAREA RUNOFF(CFS) =  208.46
  EFFECTIVE AREA(ACRES) =   1636.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1798.0         PEAK FLOW RATE(CFS) =    2012.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.07   FLOW VELOCITY(FEET/SEC.) =   7.89
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.50 =   17212.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1950.00  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1849.80   CHANNEL SLOPE =  0.0131
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.90
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.567
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2037.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.25
  AVERAGE FLOW DEPTH(FEET) =   8.89   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   41.02
  SUBAREA AREA(ACRES) =    43.12       SUBAREA RUNOFF(CFS) =   49.16
  EFFECTIVE AREA(ACRES) =   1679.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1841.1         PEAK FLOW RATE(CFS) =    2012.82
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.85   FLOW VELOCITY(FEET/SEC.) =   8.22
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1841.1  TC(MIN.) =     41.02
  EFFECTIVE AREA(ACRES) =   1679.74  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    2012.82

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2012.82   41.02    1.567  0.30( 0.30) 1.00    1679.7   10200.00
      2     1884.60   51.16    1.416  0.30( 0.30) 1.00    1841.1   10210.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S3.DAT
  TIME/DATE OF STUDY: 10:05 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.660
   2)   10.00;  4.061
   3)   15.00;  3.003
   4)   20.00;  2.468
   5)   25.00;  2.092
   6)   30.00;  1.892
   7)   40.00;  1.584
   8)   50.00;  1.424
   9)   60.00;  1.372
  10)   90.00;  1.162
  11)  120.00;  1.032
  12)  180.00;  0.931
  13)  360.00;  0.725
  14) 1440.00;  0.329
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10300.00 TO NODE  10301.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.52
  ELEVATION DATA: UPSTREAM(FEET) =   4227.21  DOWNSTREAM(FEET) =   4064.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.977
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  5.112
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.00      0.30     1.000     0    7.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.33
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      4.33

************************************************************************
  FLOW PROCESS FROM NODE  10301.00 TO NODE  10302.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4064.64  DOWNSTREAM(FEET) =   3797.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =   631.34   CHANNEL SLOPE =  0.4235
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.216
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.23      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   1.72
  Tc(MIN.) =    9.70
  SUBAREA AREA(ACRES) =     6.23       SUBAREA RUNOFF(CFS) =   21.96
  EFFECTIVE AREA(ACRES) =      7.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2          PEAK FLOW RATE(CFS) =      25.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   7.36
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10302.00 =     941.86 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10302.00 TO NODE  10303.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3797.25  DOWNSTREAM(FEET) =   3447.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1908.89   CHANNEL SLOPE =  0.1834
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.285
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.02
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   3.97
  Tc(MIN.) =   13.67
  SUBAREA AREA(ACRES) =    32.83       SUBAREA RUNOFF(CFS) =   88.19
  EFFECTIVE AREA(ACRES) =     40.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =     107.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   9.25
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10303.00 =    2850.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10303.00 TO NODE  10304.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3447.07  DOWNSTREAM(FEET) =   3228.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.05   CHANNEL SLOPE =  0.1140
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.54
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.772
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     175.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.17
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =   3.49
  Tc(MIN.) =   17.15
  SUBAREA AREA(ACRES) =    60.51       SUBAREA RUNOFF(CFS) =  134.65
  EFFECTIVE AREA(ACRES) =    100.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.6         PEAK FLOW RATE(CFS) =     223.79
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.69   FLOW VELOCITY(FEET/SEC.) =   9.89
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10304.00 =    4768.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10304.00 TO NODE  10305.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3228.48  DOWNSTREAM(FEET) =   3118.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1679.40   CHANNEL SLOPE =  0.0656
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.52
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.453
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     336.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.18
  AVERAGE FLOW DEPTH(FEET) =   2.46   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   20.20
  SUBAREA AREA(ACRES) =   116.56       SUBAREA RUNOFF(CFS) =  225.83
  EFFECTIVE AREA(ACRES) =    217.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      217.1         PEAK FLOW RATE(CFS) =     420.69
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.76   FLOW VELOCITY(FEET/SEC.) =   9.80
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10305.00 =    6448.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10305.00 TO NODE  10306.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3118.37  DOWNSTREAM(FEET) =   2807.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2853.67   CHANNEL SLOPE =  0.1088
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.93
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.175
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      189.23      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     580.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.88
  AVERAGE FLOW DEPTH(FEET) =   2.87   TRAVEL TIME(MIN.) =   3.69
  Tc(MIN.) =   23.90
  SUBAREA AREA(ACRES) =   189.23       SUBAREA RUNOFF(CFS) =  319.33
  EFFECTIVE AREA(ACRES) =    406.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      406.4          PEAK FLOW RATE(CFS) =     685.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.13   FLOW VELOCITY(FEET/SEC.) =  13.47
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10306.00 =    9301.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10306.00 TO NODE  10307.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2807.99  DOWNSTREAM(FEET) =   2591.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2848.03   CHANNEL SLOPE =  0.0759
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.24
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.991
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      416.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1003.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.12
  AVERAGE FLOW DEPTH(FEET) =   4.17   TRAVEL TIME(MIN.) =   3.62
  Tc(MIN.) =   27.51
  SUBAREA AREA(ACRES) =   416.51       SUBAREA RUNOFF(CFS) =  634.08
  EFFECTIVE AREA(ACRES) =    822.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      822.9          PEAK FLOW RATE(CFS) =    1252.70
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.66   FLOW VELOCITY(FEET/SEC.) =  13.93
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10307.00 =   12149.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10307.00 TO NODE  10308.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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```
  ELEVATION DATA: UPSTREAM(FEET) =   2591.87  DOWNSTREAM(FEET) =   2516.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.06   CHANNEL SLOPE =  0.0263
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.56
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.819
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.49      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1472.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.84
  AVERAGE FLOW DEPTH(FEET) =   6.51   TRAVEL TIME(MIN.) =   4.85
  Tc(MIN.) =   32.36
  SUBAREA AREA(ACRES) =   320.49       SUBAREA RUNOFF(CFS) =  439.44
  EFFECTIVE AREA(ACRES) =   1143.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1143.4          PEAK FLOW RATE(CFS) =    1564.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.70   FLOW VELOCITY(FEET/SEC.) =   9.99
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.00 =   15011.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.00 TO NODE  10308.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2516.62  DOWNSTREAM(FEET) =   2462.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.32   CHANNEL SLOPE =  0.0288
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.81
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.727
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.88      0.30     0.966     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.966
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1688.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.54
  AVERAGE FLOW DEPTH(FEET) =   6.79   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   35.35
  SUBAREA AREA(ACRES) =   191.88       SUBAREA RUNOFF(CFS) =  248.23
  EFFECTIVE AREA(ACRES) =   1335.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1335.2          PEAK FLOW RATE(CFS) =    1718.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.85
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.85   FLOW VELOCITY(FEET/SEC.) =  10.57
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.50 =   16901.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.50 TO NODE  10309.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.25  DOWNSTREAM(FEET) =   2409.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1874.33   CHANNEL SLOPE =  0.0279
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.01
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.636
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1772.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.55
  AVERAGE FLOW DEPTH(FEET) =   7.00   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   38.31
  SUBAREA AREA(ACRES) =    90.14       SUBAREA RUNOFF(CFS) =  108.39
  EFFECTIVE AREA(ACRES) =   1425.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1425.4         PEAK FLOW RATE(CFS) =    1718.11
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.90   FLOW VELOCITY(FEET/SEC.) =  10.46
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10309.00 =   18775.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2409.87  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2576.20   CHANNEL SLOPE =  0.0310
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.83
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.548
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1765.20
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.94
  AVERAGE FLOW DEPTH(FEET) =   6.82   TRAVEL TIME(MIN.) =   3.92
  Tc(MIN.) =   42.24
  SUBAREA AREA(ACRES) =    83.83       SUBAREA RUNOFF(CFS) =   94.18
  EFFECTIVE AREA(ACRES) =   1509.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1509.2         PEAK FLOW RATE(CFS) =    1718.11
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.73   FLOW VELOCITY(FEET/SEC.) =  10.87
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   42.24
  RAINFALL INTENSITY(INCH/HR) =   1.55
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =    1509.21
  TOTAL STREAM AREA(ACRES) =    1509.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1718.11

****************************************************************************
  FLOW PROCESS FROM NODE  10320.00 TO NODE  10321.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.56
  ELEVATION DATA: UPSTREAM(FEET) =   3374.80  DOWNSTREAM(FEET) =   3300.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.959
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.602
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.24      0.30     1.000     0    8.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.67
  TOTAL AREA(ACRES) =      2.24   PEAK FLOW RATE(CFS) =      8.67

****************************************************************************
  FLOW PROCESS FROM NODE  10321.00 TO NODE  10322.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

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 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3300.24  DOWNSTREAM(FEET) =   3187.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =   581.07   CHANNEL SLOPE =  0.1945
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.34
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.860
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        5.01      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.74
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.86
 AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.99
 Tc(MIN.) =   10.95
 SUBAREA AREA(ACRES) =     5.01       SUBAREA RUNOFF(CFS) =   16.05
 EFFECTIVE AREA(ACRES) =      7.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =        7.2         PEAK FLOW RATE(CFS) =      23.23
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.39

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   5.50
 LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10322.00 =     871.63 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10322.00 TO NODE  10323.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3187.21  DOWNSTREAM(FEET) =   3108.86
 CHANNEL LENGTH THRU SUBAREA(FEET) =   977.98   CHANNEL SLOPE =  0.0801
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.98
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.274
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       30.37      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.18
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.89
 AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =   2.77
 Tc(MIN.) =   13.72
 SUBAREA AREA(ACRES) =    30.37       SUBAREA RUNOFF(CFS) =   81.30
 EFFECTIVE AREA(ACRES) =     37.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =     100.71
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
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 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   6.81
 LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10323.00 =    1849.61 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10323.00 TO NODE  10324.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3108.86  DOWNSTREAM(FEET) =   2923.03
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.11   CHANNEL SLOPE =  0.0966
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.746
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       68.88      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     176.83
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.70
 AVERAGE FLOW DEPTH(FEET) =   1.55   TRAVEL TIME(MIN.) =   3.69
 Tc(MIN.) =   17.41
 SUBAREA AREA(ACRES) =    68.88       SUBAREA RUNOFF(CFS) =  151.62
 EFFECTIVE AREA(ACRES) =    106.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      106.5         PEAK FLOW RATE(CFS) =     234.42
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =   9.49
 LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10324.00 =    3773.72 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10324.00 TO NODE  10325.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2923.03  DOWNSTREAM(FEET) =   2675.11
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2788.58   CHANNEL SLOPE =  0.0889
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.331
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      146.19      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     368.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.51
  AVERAGE FLOW DEPTH(FEET) =   2.38   TRAVEL TIME(MIN.) =   4.42
  Tc(MIN.) =   21.83
  SUBAREA AREA(ACRES) =   146.19       SUBAREA RUNOFF(CFS) =  267.19
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =     461.85
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.68   FLOW VELOCITY(FEET/SEC.) =  11.22
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10325.00 =    6562.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10325.00 TO NODE  10326.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2675.11  DOWNSTREAM(FEET) =   2541.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.28   CHANNEL SLOPE =  0.0465
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.09
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.028
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      321.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     712.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.00
  AVERAGE FLOW DEPTH(FEET) =   3.97   TRAVEL TIME(MIN.) =   4.77
  Tc(MIN.) =   26.59
  SUBAREA AREA(ACRES) =   321.78       SUBAREA RUNOFF(CFS) =  500.53
  EFFECTIVE AREA(ACRES) =    574.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      574.5         PEAK FLOW RATE(CFS) =     893.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.45   FLOW VELOCITY(FEET/SEC.) =  10.64
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.00 =    9424.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10326.00 TO NODE  10326.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2541.92  DOWNSTREAM(FEET) =   2438.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2617.40   CHANNEL SLOPE =  0.0394
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.99
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.868
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      187.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1025.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.39
  AVERAGE FLOW DEPTH(FEET) =   4.96   TRAVEL TIME(MIN.) =   4.20
  Tc(MIN.) =   30.79
  SUBAREA AREA(ACRES) =   187.06       SUBAREA RUNOFF(CFS) =  263.93
  EFFECTIVE AREA(ACRES) =    761.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      761.5         PEAK FLOW RATE(CFS) =    1074.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.07   FLOW VELOCITY(FEET/SEC.) =  10.52
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.50 =   12041.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10326.50 TO NODE  10327.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2438.80  DOWNSTREAM(FEET) =   2414.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1181.79   CHANNEL SLOPE =  0.0204
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.10
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.795
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1129.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.36
  AVERAGE FLOW DEPTH(FEET) =   6.09   TRAVEL TIME(MIN.) =   2.36
  Tc(MIN.) =   33.15
  SUBAREA AREA(ACRES) =    82.27       SUBAREA RUNOFF(CFS) =  110.70
  EFFECTIVE AREA(ACRES) =    843.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      843.8         PEAK FLOW RATE(CFS) =    1135.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.11   FLOW VELOCITY(FEET/SEC.) =   8.37
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  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.00 =   13223.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.00 TO NODE  10327.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2414.64  DOWNSTREAM(FEET) =   2389.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2431.92   CHANNEL SLOPE =  0.0102
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.66
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.608
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      243.69      0.30     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1279.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.68
  AVERAGE FLOW DEPTH(FEET) =   7.60   TRAVEL TIME(MIN.) =   6.06
  Tc(MIN.) =   39.21
  SUBAREA AREA(ACRES) =   243.69       SUBAREA RUNOFF(CFS) =  287.15
  EFFECTIVE AREA(ACRES) =   1087.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1087.5         PEAK FLOW RATE(CFS) =    1280.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.60   FLOW VELOCITY(FEET/SEC.) =   6.68
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.50 =   15655.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2389.73  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.59   CHANNEL SLOPE =  0.0306
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.96
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.545
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1319.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.11
  AVERAGE FLOW DEPTH(FEET) =   5.96   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   42.42
```



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  SUBAREA AREA(ACRES) =    69.36       SUBAREA RUNOFF(CFS) =   77.74
  EFFECTIVE AREA(ACRES) =   1156.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1156.8         PEAK FLOW RATE(CFS) =    1296.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.91   FLOW VELOCITY(FEET/SEC.) =  10.06
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10330.00 =   17600.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   42.42
  RAINFALL INTENSITY(INCH/HR) =   1.55
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1156.85
  TOTAL STREAM AREA(ACRES) =    1156.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1296.88

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1718.11   42.24    1.548  0.30( 0.30) 0.99    1509.2   10300.00
      2     1296.88   42.42    1.545  0.30( 0.30) 1.00    1156.8   10320.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3012.48   42.24    1.548  0.30( 0.30) 1.00    2661.2   10300.00
      2     3011.05   42.42    1.545  0.30( 0.30) 1.00    2666.1   10320.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    3012.48    Tc(MIN.) =    42.24
  EFFECTIVE AREA(ACRES) =    2661.18   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2666.1
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10330.00 TO NODE  10331.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2330.13  DOWNSTREAM(FEET) =   2041.66
```

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  CHANNEL LENGTH THRU SUBAREA(FEET) =  3034.53   CHANNEL SLOPE =  0.0951
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.78
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.506
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       70.23      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3050.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.11
  AVERAGE FLOW DEPTH(FEET) =   6.78   TRAVEL TIME(MIN.) =   2.65
  Tc(MIN.) =   44.88
  SUBAREA AREA(ACRES) =    70.23       SUBAREA RUNOFF(CFS) =   76.22
  EFFECTIVE AREA(ACRES) =   2731.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2736.3         PEAK FLOW RATE(CFS) =    3012.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.73   FLOW VELOCITY(FEET/SEC.) =  19.06
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10331.00 =   24386.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2041.66  DOWNSTREAM(FEET) =   1739.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3264.87   CHANNEL SLOPE =  0.0924
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.84
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.460
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      104.94      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3067.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.94
  AVERAGE FLOW DEPTH(FEET) =   6.84   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   47.76
  SUBAREA AREA(ACRES) =   104.94       SUBAREA RUNOFF(CFS) =  109.55
  EFFECTIVE AREA(ACRES) =   2836.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2841.2         PEAK FLOW RATE(CFS) =    3012.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.78
```



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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.78   FLOW VELOCITY(FEET/SEC.) =  18.86
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S1.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1834.14   75.95  0.30( 0.30) 1.00    2134.1   10100.00
    TOTAL AREA(ACRES) =     2134.1

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S2.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2012.82   41.02  0.30( 0.30) 1.00    1679.7   10200.00
      2     1884.60   51.16  0.30( 0.30) 1.00    1841.1   10210.00
    TOTAL AREA(ACRES) =     1841.1

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2012.82   41.02  0.30( 0.30) 1.00    1679.7   10200.00
      2     1884.60   51.16  0.30( 0.30) 1.00    1841.1   10210.00
    TOTAL AREA(ACRES) =      1841.1

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
     1     2012.82   41.02    1.568  0.30( 0.30) 1.00    1679.7   10200.00
     2     1884.60   51.16    1.418  0.30( 0.30) 1.00    1841.1   10210.00
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1834.14   75.95    1.260  0.30( 0.30) 1.00    2134.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3320.40   41.02    1.568  0.30( 0.30) 1.00    2832.3   10200.00
      2     3322.85   51.16    1.418  0.30( 0.30) 1.00    3278.6   10210.00
      3     3453.02   75.95    1.260  0.30( 0.30) 1.00    3975.2   10100.00
    TOTAL AREA(ACRES) =      3975.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3453.02  Tc(MIN.) =   75.954
  EFFECTIVE AREA(ACRES) =   3975.25  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3975.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10222.00 TO NODE  10332.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1925.82  DOWNSTREAM(FEET) =   1739.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1475.92   CHANNEL SLOPE =  0.1259
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.73
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.252
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       19.92      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3461.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.91
  AVERAGE FLOW DEPTH(FEET) =   6.73   TRAVEL TIME(MIN.) =   1.12
  Tc(MIN.) =   77.08
  SUBAREA AREA(ACRES) =    19.92       SUBAREA RUNOFF(CFS) =   17.08
  EFFECTIVE AREA(ACRES) =   3995.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3995.2         PEAK FLOW RATE(CFS) =    3453.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.72   FLOW VELOCITY(FEET/SEC.) =  21.90
```



```
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3320.40   42.15    1.550  0.30( 0.30) 1.00    2852.3   10200.00
      2     3322.85   52.30    1.412  0.30( 0.30) 1.00    3298.6   10210.00
      3     3453.02   77.08    1.252  0.30( 0.30) 1.00    3995.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3012.48   47.76    1.460  0.30( 0.30) 1.00    2836.4   10300.00
      2     3011.05   47.93    1.457  0.30( 0.30) 1.00    2841.2   10320.00
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     6184.75   42.15    1.550  0.30( 0.30) 1.00    5355.9   10200.00
      2     6334.23   47.76    1.460  0.30( 0.30) 1.00    5935.2   10300.00
      3     6332.85   47.93    1.457  0.30( 0.30) 1.00    5947.9   10320.00
      4     6216.98   52.30    1.412  0.30( 0.30) 1.00    6139.8   10210.00
      5     5932.27   77.08    1.252  0.30( 0.30) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =      6836.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     6334.23  Tc(MIN.) =   47.757
  EFFECTIVE AREA(ACRES) =   5935.17  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     6836.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     6836.4  TC(MIN.) =     47.76
  EFFECTIVE AREA(ACRES) =   5935.17  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.998
  PEAK FLOW RATE(CFS)   =    6334.23

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     6184.75   42.15    1.550  0.30( 0.30) 1.00    5355.9   10200.00
      2     6334.23   47.76    1.460  0.30( 0.30) 1.00    5935.2   10300.00
      3     6332.85   47.93    1.457  0.30( 0.30) 1.00    5947.9   10320.00
      4     6216.98   52.30    1.412  0.30( 0.30) 1.00    6139.8   10210.00
      5     5932.27   77.08    1.252  0.30( 0.30) 1.00    6836.4   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S4.DAT
  TIME/DATE OF STUDY: 10:05 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.582
   2)   10.00;  4.025
   3)   15.00;  2.982
   4)   20.00;  2.453
   5)   25.00;  2.081
   6)   30.00;  1.882
   7)   40.00;  1.577
   8)   50.00;  1.416
   9)   60.00;  1.361
  10)   90.00;  1.151
  11)  120.00;  1.021
  12)  180.00;  0.919
  13)  360.00;  0.714
  14) 1440.00;  0.324
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10400.00 TO NODE  10401.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.42
  ELEVATION DATA: UPSTREAM(FEET) =   2648.70  DOWNSTREAM(FEET) =   2536.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.799
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.792
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.89      0.30     1.000     0   16.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.21
  TOTAL AREA(ACRES) =      5.89   PEAK FLOW RATE(CFS) =     13.21

**************************************************************************
  FLOW PROCESS FROM NODE  10401.00 TO NODE  10402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2536.15  DOWNSTREAM(FEET) =   2504.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   934.06   CHANNEL SLOPE =  0.0340
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.353
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.42
  AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   4.55
  Tc(MIN.) =   21.35
  SUBAREA AREA(ACRES) =    17.57       SUBAREA RUNOFF(CFS) =   32.46
  EFFECTIVE AREA(ACRES) =     23.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.5          PEAK FLOW RATE(CFS) =      43.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.94   FLOW VELOCITY(FEET/SEC.) =   3.88
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.00 =    1884.48 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10402.00 TO NODE  10402.50 IS CODE =  56
```

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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2504.36  DOWNSTREAM(FEET) =   2462.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.55   CHANNEL SLOPE =  0.0439
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.37
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.134
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      90.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.39
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   24.29
  SUBAREA AREA(ACRES) =    56.74       SUBAREA RUNOFF(CFS) =   93.64
  EFFECTIVE AREA(ACRES) =     80.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       80.2         PEAK FLOW RATE(CFS) =     132.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.65   FLOW VELOCITY(FEET/SEC.) =   6.05
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.50 =    2836.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10402.50 TO NODE  10403.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.54  DOWNSTREAM(FEET) =   2433.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.41   CHANNEL SLOPE =  0.0299
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.999
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     184.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.85
  AVERAGE FLOW DEPTH(FEET) =   2.19   TRAVEL TIME(MIN.) =   2.76
  Tc(MIN.) =   27.05
  SUBAREA AREA(ACRES) =    68.01       SUBAREA RUNOFF(CFS) =  104.02
  EFFECTIVE AREA(ACRES) =    148.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      148.2         PEAK FLOW RATE(CFS) =     226.69
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.45   FLOW VELOCITY(FEET/SEC.) =   6.20
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10403.00 =    3803.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10403.00 TO NODE  10404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2433.59  DOWNSTREAM(FEET) =   2239.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2934.12   CHANNEL SLOPE =  0.0662
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.88
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.821
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      301.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     433.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.91
  AVERAGE FLOW DEPTH(FEET) =   2.80   TRAVEL TIME(MIN.) =   4.94
  Tc(MIN.) =   31.99
  SUBAREA AREA(ACRES) =   301.25       SUBAREA RUNOFF(CFS) =  412.51
  EFFECTIVE AREA(ACRES) =    449.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      449.5         PEAK FLOW RATE(CFS) =     615.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.37   FLOW VELOCITY(FEET/SEC.) =  10.92
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10404.00 =    6737.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10404.00 TO NODE  10405.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2239.33  DOWNSTREAM(FEET) =   2128.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.32   CHANNEL SLOPE =  0.0386
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.18
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.666
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      152.68      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     709.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.35
  AVERAGE FLOW DEPTH(FEET) =   4.15   TRAVEL TIME(MIN.) =   5.10
  Tc(MIN.) =   37.09
  SUBAREA AREA(ACRES) =   152.68       SUBAREA RUNOFF(CFS) =  187.68
  EFFECTIVE AREA(ACRES) =    602.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      602.1          PEAK FLOW RATE(CFS) =     740.17
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.24   FLOW VELOCITY(FEET/SEC.) =   9.45
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10405.00 =    9599.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2128.80  DOWNSTREAM(FEET) =   1759.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.12   CHANNEL SLOPE =  0.1878
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.99
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.608
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      139.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     822.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.29
  AVERAGE FLOW DEPTH(FEET) =   2.98   TRAVEL TIME(MIN.) =   1.90
  Tc(MIN.) =   38.99
  SUBAREA AREA(ACRES) =   139.70       SUBAREA RUNOFF(CFS) =  164.46
  EFFECTIVE AREA(ACRES) =    741.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      741.8          PEAK FLOW RATE(CFS) =     873.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.08   FLOW VELOCITY(FEET/SEC.) =  17.57
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10420.00 =   11566.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   38.99
  RAINFALL INTENSITY(INCH/HR) =   1.61
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     741.84
  TOTAL STREAM AREA(ACRES) =     741.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     873.30

****************************************************************************
  FLOW PROCESS FROM NODE  10410.00 TO NODE  10411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   413.10
  ELEVATION DATA: UPSTREAM(FEET) =   3217.26  DOWNSTREAM(FEET) =   3058.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.517
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.272
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        3.06      0.30     1.000     0    9.52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.94
  TOTAL AREA(ACRES) =      3.06   PEAK FLOW RATE(CFS) =     10.94

****************************************************************************
  FLOW PROCESS FROM NODE  10411.00 TO NODE  10412.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3058.86  DOWNSTREAM(FEET) =   2879.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.18   CHANNEL SLOPE =  0.3495
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.829
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.99
  AVERAGE FLOW DEPTH(FEET) =   0.28   TRAVEL TIME(MIN.) =   1.42
  Tc(MIN.) =   10.94
  SUBAREA AREA(ACRES) =     4.24       SUBAREA RUNOFF(CFS) =   13.47
  EFFECTIVE AREA(ACRES) =      7.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.3          PEAK FLOW RATE(CFS) =      23.18
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   6.69
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10412.00 =     925.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10412.00 TO NODE  10413.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.84  DOWNSTREAM(FEET) =   2644.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.24   CHANNEL SLOPE =  0.1208
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.05
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.942
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      80.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.30
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   4.44
  Tc(MIN.) =   15.38
  SUBAREA AREA(ACRES) =    47.95       SUBAREA RUNOFF(CFS) =  114.00
  EFFECTIVE AREA(ACRES) =     55.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.2         PEAK FLOW RATE(CFS) =     131.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   8.55
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10413.00 =    2869.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10413.00 TO NODE  10414.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2644.97  DOWNSTREAM(FEET) =   2550.42
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.61   CHANNEL SLOPE =  0.0468
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.58
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.482
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.60      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     281.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.75
  AVERAGE FLOW DEPTH(FEET) =   2.44   TRAVEL TIME(MIN.) =   4.34
  Tc(MIN.) =   19.72
  SUBAREA AREA(ACRES) =   151.60       SUBAREA RUNOFF(CFS) =  297.74
  EFFECTIVE AREA(ACRES) =    206.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.9          PEAK FLOW RATE(CFS) =     406.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.96   FLOW VELOCITY(FEET/SEC.) =   8.60
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10414.00 =    4889.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10414.00 TO NODE  10415.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2550.42  DOWNSTREAM(FEET) =   2391.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.76   CHANNEL SLOPE =  0.0830
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.15
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.271
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      206.03      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     589.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.72
  AVERAGE FLOW DEPTH(FEET) =   3.10   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   22.45
  SUBAREA AREA(ACRES) =   206.03       SUBAREA RUNOFF(CFS) =  365.43
  EFFECTIVE AREA(ACRES) =    412.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      412.9          PEAK FLOW RATE(CFS) =     732.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.47   FLOW VELOCITY(FEET/SEC.) =  12.44
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10415.00 =    6805.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10415.00 TO NODE  10416.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2391.31  DOWNSTREAM(FEET) =   2092.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2843.10   CHANNEL SLOPE =  0.1052
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.51
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.048
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      122.38      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     828.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.03
  AVERAGE FLOW DEPTH(FEET) =   3.48   TRAVEL TIME(MIN.) =   3.38
  Tc(MIN.) =   25.83
  SUBAREA AREA(ACRES) =   122.38       SUBAREA RUNOFF(CFS) =  192.54
  EFFECTIVE AREA(ACRES) =    535.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      535.3         PEAK FLOW RATE(CFS) =     842.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.51   FLOW VELOCITY(FEET/SEC.) =  14.08
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10416.00 =    9648.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2092.16  DOWNSTREAM(FEET) =   1759.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2151.95   CHANNEL SLOPE =  0.1546
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.27
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.961
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.94      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     886.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.45
  AVERAGE FLOW DEPTH(FEET) =   3.26   TRAVEL TIME(MIN.) =   2.18
  Tc(MIN.) =   28.01
  SUBAREA AREA(ACRES) =    59.94       SUBAREA RUNOFF(CFS) =   89.62
  EFFECTIVE AREA(ACRES) =    595.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      595.2         PEAK FLOW RATE(CFS) =     889.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.27
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.27   FLOW VELOCITY(FEET/SEC.) =  16.45
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.01
  RAINFALL INTENSITY(INCH/HR) =   1.96
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     595.20
  TOTAL STREAM AREA(ACRES) =     595.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     889.94

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      873.30   38.99    1.608  0.30( 0.30) 1.00     741.8   10400.00
      2      889.94   28.01    1.961  0.30( 0.30) 1.00     595.2   10410.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1686.83   28.01    1.961  0.30( 0.30) 1.00    1128.2   10410.00
      2     1573.98   38.99    1.608  0.30( 0.30) 1.00    1337.0   10400.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1686.83    Tc(MIN.) =    28.01
  EFFECTIVE AREA(ACRES) =    1128.16   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1337.0
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1759.52  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2477.21   CHANNEL SLOPE =  0.0287
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.89
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.824
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -       72.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1736.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.61
  AVERAGE FLOW DEPTH(FEET) =   6.89   TRAVEL TIME(MIN.) =   3.89
  Tc(MIN.) =   31.90
  SUBAREA AREA(ACRES) =    72.64       SUBAREA RUNOFF(CFS) =   99.64
  EFFECTIVE AREA(ACRES) =   1200.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1409.7          PEAK FLOW RATE(CFS) =    1686.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.79   FLOW VELOCITY(FEET/SEC.) =  10.52
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S3.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     6184.75   42.15  0.30( 0.30) 1.00    5355.9   10200.00
      2     6334.23   47.76  0.30( 0.30) 1.00    5935.2   10300.00
      3     6332.85   47.93  0.30( 0.30) 1.00    5947.9   10320.00
      4     6216.98   52.30  0.30( 0.30) 1.00    6139.8   10210.00
      5     5932.27   77.08  0.30( 0.30) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =     6836.4

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     6184.75   42.15  0.30( 0.30) 1.00    5355.9   10200.00
      2     6334.23   47.76  0.30( 0.30) 1.00    5935.2   10300.00
      3     6332.85   47.93  0.30( 0.30) 1.00    5947.9   10320.00
      4     6216.98   52.30  0.30( 0.30) 1.00    6139.8   10210.00
      5     5932.27   77.08  0.30( 0.30) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =      6836.4
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1739.96  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2238.93   CHANNEL SLOPE =  0.0231
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.05
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.412
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6365.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.32
  AVERAGE FLOW DEPTH(FEET) =   9.05   TRAVEL TIME(MIN.) =   3.03
  Tc(MIN.) =   50.79
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =   61.97
  EFFECTIVE AREA(ACRES) =   5997.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6898.3          PEAK FLOW RATE(CFS) =    6334.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.02   FLOW VELOCITY(FEET/SEC.) =  12.30
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6184.75   45.20    1.493  0.30( 0.30) 1.00    5417.8   10200.00
      2     6334.23   50.79    1.412  0.30( 0.30) 1.00    5997.1   10300.00
      3     6332.85   50.97    1.411  0.30( 0.30) 1.00    6009.8   10320.00
      4     6216.98   55.34    1.387  0.30( 0.30) 1.00    6201.7   10210.00
      5     5932.27   80.16    1.220  0.30( 0.30) 1.00    6898.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1686.83   31.90    1.824  0.30( 0.30) 1.00    1200.8   10410.00
      2     1573.98   42.95    1.529  0.30( 0.30) 1.00    1409.7   10400.00
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7260.79	31.90	1.824	0.30(0.30)	1.00	5024.1	10410.00
2	7629.15	42.95	1.529	0.30(0.30)	1.00	6557.7	10400.00
3	7712.33	45.20	1.493	0.30(0.30)	1.00	6827.5	10200.00
4	7757.45	50.79	1.412	0.30(0.30)	1.00	7406.8	10300.00
5	7754.81	50.97	1.411	0.30(0.30)	1.00	7419.5	10320.00
6	7608.13	55.34	1.387	0.30(0.30)	1.00	7611.4	10210.00
7	7109.95	80.16	1.220	0.30(0.30)	1.00	8308.0	10100.00

TOTAL AREA(ACRES) = 8308.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 7757.45 Tc(MIN.) = 50.786
EFFECTIVE AREA(ACRES) = 7406.78 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 8308.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 8308.0 TC(MIN.) = 50.79
EFFECTIVE AREA(ACRES) = 7406.78 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998
PEAK FLOW RATE(CFS) = 7757.45

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7260.79	31.90	1.824	0.30(0.30)	1.00	5024.1	10410.00
2	7629.15	42.95	1.529	0.30(0.30)	1.00	6557.7	10400.00
3	7712.33	45.20	1.493	0.30(0.30)	1.00	6827.5	10200.00
4	7757.45	50.79	1.412	0.30(0.30)	1.00	7406.8	10300.00
5	7754.81	50.97	1.411	0.30(0.30)	1.00	7419.5	10320.00
6	7608.13	55.34	1.387	0.30(0.30)	1.00	7611.4	10210.00
7	7109.95	80.16	1.220	0.30(0.30)	1.00	8308.0	10100.00

==========

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END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S5.DAT
  TIME/DATE OF STUDY: 10:05 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.582
   2)   10.00;  4.025
   3)   15.00;  2.982
   4)   20.00;  2.453
   5)   25.00;  2.081
   6)   30.00;  1.882
   7)   40.00;  1.577
   8)   50.00;  1.416
   9)   60.00;  1.361
  10)   90.00;  1.151
  11)  120.00;  1.021
  12)  180.00;  0.919
  13)  360.00;  0.714
  14) 1440.00;  0.324
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10500.00 TO NODE  10501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.64
  ELEVATION DATA: UPSTREAM(FEET) =   3108.31  DOWNSTREAM(FEET) =   3060.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.565
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  5.781
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          -        1.54      0.30      0.910     0    6.57
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
  SUBAREA RUNOFF(CFS) =      7.63
  TOTAL AREA(ACRES) =      1.54   PEAK FLOW RATE(CFS) =      7.63

**************************************************************************
  FLOW PROCESS FROM NODE  10501.00 TO NODE  10502.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3060.24  DOWNSTREAM(FEET) =   2942.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.48   CHANNEL SLOPE =  0.1703
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.685
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.27      0.30      0.943     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.943
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.37
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   2.14
  Tc(MIN.) =    8.71
  SUBAREA AREA(ACRES) =     8.27       SUBAREA RUNOFF(CFS) =   32.77
  EFFECTIVE AREA(ACRES) =      9.81     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =        9.8          PEAK FLOW RATE(CFS) =      38.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   6.34
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10502.00 =     986.12 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10502.00 TO NODE  10503.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2942.64  DOWNSTREAM(FEET) =   2815.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   957.31   CHANNEL SLOPE =  0.1331
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.88
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.828
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.15
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   10.94
  SUBAREA AREA(ACRES) =    18.91       SUBAREA RUNOFF(CFS) =   60.05
  EFFECTIVE AREA(ACRES) =     28.72     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       28.7         PEAK FLOW RATE(CFS) =      91.37
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   7.85
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10503.00 =    1943.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10503.00 TO NODE  10504.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2815.24  DOWNSTREAM(FEET) =   2202.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2096.20   CHANNEL SLOPE =  0.2923
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.270
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.49      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     192.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.05
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   13.62
  SUBAREA AREA(ACRES) =    75.49       SUBAREA RUNOFF(CFS) =  201.79
  EFFECTIVE AREA(ACRES) =    104.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =     278.72
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.47   FLOW VELOCITY(FEET/SEC.) =  14.68
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10504.00 =    4039.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10504.00 TO NODE  10505.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2202.44  DOWNSTREAM(FEET) =   1969.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.32   CHANNEL SLOPE =  0.0834
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.26
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.706
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      278.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     581.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.70
  AVERAGE FLOW DEPTH(FEET) =   3.08   TRAVEL TIME(MIN.) =   3.99
  Tc(MIN.) =   17.61
  SUBAREA AREA(ACRES) =   278.21       SUBAREA RUNOFF(CFS) =  602.44
  EFFECTIVE AREA(ACRES) =    382.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      382.4         PEAK FLOW RATE(CFS) =     828.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.70   FLOW VELOCITY(FEET/SEC.) =  12.89
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10505.00 =    6839.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10505.00 TO NODE  10506.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1969.00  DOWNSTREAM(FEET) =   1759.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.99   CHANNEL SLOPE =  0.0725
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.57
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.361
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      323.47      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1128.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.32
  AVERAGE FLOW DEPTH(FEET) =   4.47   TRAVEL TIME(MIN.) =   3.62
  Tc(MIN.) =   21.23
  SUBAREA AREA(ACRES) =   323.47       SUBAREA RUNOFF(CFS) =  600.17
  EFFECTIVE AREA(ACRES) =    705.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      705.9         PEAK FLOW RATE(CFS) =    1309.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.81   FLOW VELOCITY(FEET/SEC.) =  13.87
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10506.00 =    9732.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1759.23  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2597.28   CHANNEL SLOPE =  0.0273
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.52
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.058
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.34      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1477.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.98
  AVERAGE FLOW DEPTH(FEET) =   6.46   TRAVEL TIME(MIN.) =   4.34
  Tc(MIN.) =   25.57
  SUBAREA AREA(ACRES) =   212.34       SUBAREA RUNOFF(CFS) =  336.07
  EFFECTIVE AREA(ACRES) =    918.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      918.2         PEAK FLOW RATE(CFS) =    1453.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.41   FLOW VELOCITY(FEET/SEC.) =   9.93
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      918.2  TC(MIN.) =     25.57
  EFFECTIVE AREA(ACRES) =    918.23  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    1453.45
============================================================================
```



```
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S6.DAT
  TIME/DATE OF STUDY: 10:05 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.496
   2)   10.00;  3.984
   3)   15.00;  2.958
   4)   20.00;  2.436
   5)   25.00;  2.069
   6)   30.00;  1.871
   7)   40.00;  1.568
   8)   50.00;  1.408
   9)   60.00;  1.349
  10)   90.00;  1.140
  11)  120.00;  1.010
  12)  180.00;  0.906
  13)  360.00;  0.702
  14) 1440.00;  0.318
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10600.00 TO NODE  10601.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   312.13
  ELEVATION DATA: UPSTREAM(FEET) =   3250.51  DOWNSTREAM(FEET) =   3126.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.451
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.762
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.47      0.30     1.000      0    8.45
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.92
  TOTAL AREA(ACRES) =      2.47   PEAK FLOW RATE(CFS) =      9.92

**************************************************************************
  FLOW PROCESS FROM NODE  10601.00 TO NODE  10602.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3126.78  DOWNSTREAM(FEET) =   2951.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.40   CHANNEL SLOPE =  0.2828
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.948
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.58      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.99
  AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   1.73
  Tc(MIN.) =   10.18
  SUBAREA AREA(ACRES) =     6.58       SUBAREA RUNOFF(CFS) =   21.60
  EFFECTIVE AREA(ACRES) =      9.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =      29.71
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =   6.75
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10602.00 =     932.53 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10602.00 TO NODE  10603.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2951.30  DOWNSTREAM(FEET) =   2641.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1930.18   CHANNEL SLOPE =  0.1606
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.206
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     110.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.90
  AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =   13.79
  SUBAREA AREA(ACRES) =    60.78       SUBAREA RUNOFF(CFS) =  158.99
  EFFECTIVE AREA(ACRES) =     69.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.8         PEAK FLOW RATE(CFS) =     182.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.37   FLOW VELOCITY(FEET/SEC.) =  10.46
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10603.00 =    2862.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10603.00 TO NODE  10604.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2641.28  DOWNSTREAM(FEET) =   2318.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.90   CHANNEL SLOPE =  0.1640
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.70
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.793
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     259.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.75
  AVERAGE FLOW DEPTH(FEET) =   1.66   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   16.58
  SUBAREA AREA(ACRES) =    68.78       SUBAREA RUNOFF(CFS) =  154.34
  EFFECTIVE AREA(ACRES) =    138.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      138.6         PEAK FLOW RATE(CFS) =     311.04
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =  12.41
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10604.00 =    4829.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10604.00 TO NODE  10605.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2318.61  DOWNSTREAM(FEET) =   1983.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2601.81   CHANNEL SLOPE =  0.1286
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.56
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.444
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      178.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     483.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.96
  AVERAGE FLOW DEPTH(FEET) =   2.49   TRAVEL TIME(MIN.) =   3.35
  Tc(MIN.) =   19.92
  SUBAREA AREA(ACRES) =   178.16       SUBAREA RUNOFF(CFS) =  343.78
  EFFECTIVE AREA(ACRES) =    316.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      316.8         PEAK FLOW RATE(CFS) =     611.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.82   FLOW VELOCITY(FEET/SEC.) =  13.86
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10605.00 =    7431.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1983.94  DOWNSTREAM(FEET) =   1655.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2439.06   CHANNEL SLOPE =  0.1348
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.92
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.235
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.31      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     664.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.44
  AVERAGE FLOW DEPTH(FEET) =   2.91   TRAVEL TIME(MIN.) =   2.82
  Tc(MIN.) =   22.74
  SUBAREA AREA(ACRES) =    61.31       SUBAREA RUNOFF(CFS) =  106.77
  EFFECTIVE AREA(ACRES) =    378.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      378.1          PEAK FLOW RATE(CFS) =     658.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.90   FLOW VELOCITY(FEET/SEC.) =  14.39
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S4.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     7260.79   31.90  0.30( 0.30) 1.00    5024.1   10410.00
      2     7629.15   42.95  0.30( 0.30) 1.00    6557.7   10400.00
      3     7712.33   45.20  0.30( 0.30) 1.00    6827.5   10200.00
      4     7757.45   50.79  0.30( 0.30) 1.00    7406.8   10300.00
      5     7754.81   50.97  0.30( 0.30) 1.00    7419.5   10320.00
      6     7608.13   55.34  0.30( 0.30) 1.00    7611.4   10210.00
      7     7109.95   80.16  0.30( 0.30) 1.00    8308.0   10100.00
    TOTAL AREA(ACRES) =     8308.0

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S5.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1453.45   25.57  0.30( 0.30) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =      918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
```



```
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1453.45   25.57  0.30( 0.30) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =      918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1453.45   25.57    2.047  0.30( 0.30) 1.00     918.2   10500.00
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7260.79   31.90    1.813  0.30( 0.30) 1.00    5024.1   10410.00
      2     7629.15   42.95    1.521  0.30( 0.30) 1.00    6557.7   10400.00
      3     7712.33   45.20    1.485  0.30( 0.30) 1.00    6827.5   10200.00
      4     7757.45   50.79    1.403  0.30( 0.30) 1.00    7406.8   10300.00
      5     7754.81   50.97    1.402  0.30( 0.30) 1.00    7419.5   10320.00
      6     7608.13   55.34    1.376  0.30( 0.30) 1.00    7611.4   10210.00
      7     7109.95   80.16    1.209  0.30( 0.30) 1.00    8308.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     8168.66   25.57    2.047  0.30( 0.30) 1.00    4944.6   10500.00
      2     8520.22   31.90    1.813  0.30( 0.30) 1.00    5942.3   10410.00
      3     8645.06   42.95    1.521  0.30( 0.30) 1.00    7475.9   10400.00
      4     8698.28   45.20    1.485  0.30( 0.30) 1.00    7745.7   10200.00
      5     8675.70   50.79    1.403  0.30( 0.30) 1.00    8325.0   10300.00
      6     8672.18   50.97    1.402  0.30( 0.30) 1.00    8337.7   10320.00
      7     8504.02   55.34    1.376  0.30( 0.30) 1.00    8529.6   10210.00
      8     7866.11   80.16    1.209  0.30( 0.30) 1.00    9226.2   10100.00
    TOTAL AREA(ACRES) =      9226.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     8698.28  Tc(MIN.) =   45.205
  EFFECTIVE AREA(ACRES) =   7745.72  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     9226.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10507.00 TO NODE  10620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1688.35  DOWNSTREAM(FEET) =   1655.24
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2570.61   CHANNEL SLOPE =  0.0129
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  12.16
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.421
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       83.74      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    8740.54
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.82
 AVERAGE FLOW DEPTH(FEET) =  12.15   TRAVEL TIME(MIN.) =   3.96
 Tc(MIN.) =   49.16
 SUBAREA AREA(ACRES) =    83.74       SUBAREA RUNOFF(CFS) =   84.52
 EFFECTIVE AREA(ACRES) =   7829.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     9310.0         PEAK FLOW RATE(CFS) =    8698.28
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  12.12

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 12.12   FLOW VELOCITY(FEET/SEC.) =  10.81
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     8168.66   29.59    1.887  0.30( 0.30) 1.00    5028.3   10500.00
     2     8520.22   35.88    1.693  0.30( 0.30) 1.00    6026.0   10410.00
     3     8645.06   46.92    1.457  0.30( 0.30) 1.00    7559.7   10400.00
     4     8698.28   49.16    1.421  0.30( 0.30) 1.00    7829.5   10200.00
     5     8675.70   54.75    1.380  0.30( 0.30) 1.00    8408.7   10300.00
     6     8672.18   54.93    1.379  0.30( 0.30) 1.00    8421.5   10320.00
     7     8504.02   59.32    1.353  0.30( 0.30) 1.00    8613.4   10210.00
     8     7866.11   84.23    1.180  0.30( 0.30) 1.00    9310.0   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      658.43   22.74    2.235  0.30( 0.30) 1.00     378.1   10600.00
 LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     8310.84   22.74    2.235  0.30( 0.30) 1.00    4242.7   10600.00
```



```
     2     8708.82   29.59    1.887  0.30( 0.30) 1.00    5406.4   10500.00
     3     8994.22   35.88    1.693  0.30( 0.30) 1.00    6404.1   10410.00
     4     9038.88   46.92    1.457  0.30( 0.30) 1.00    7937.8   10400.00
     5     9079.88   49.16    1.421  0.30( 0.30) 1.00    8207.5   10200.00
     6     9043.22   54.75    1.380  0.30( 0.30) 1.00    8786.8   10300.00
     7     9039.33   54.93    1.379  0.30( 0.30) 1.00    8799.5   10320.00
     8     8862.35   59.32    1.353  0.30( 0.30) 1.00    8991.5   10210.00
     9     8165.64   84.23    1.180  0.30( 0.30) 1.00    9688.1   10100.00
   TOTAL AREA(ACRES) =      9688.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     9079.88  Tc(MIN.) =   49.163
 EFFECTIVE AREA(ACRES) =   8207.54  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     9688.1
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10620.00 =   37862.98 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10620.00 TO NODE  10621.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1655.24  DOWNSTREAM(FEET) =   1584.84
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2294.47   CHANNEL SLOPE =  0.0307
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.14
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.398
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      342.43      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9249.09
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.12
 AVERAGE FLOW DEPTH(FEET) =  10.13   TRAVEL TIME(MIN.) =   2.53
 Tc(MIN.) =   51.69
 SUBAREA AREA(ACRES) =   342.43       SUBAREA RUNOFF(CFS) =  338.42
 EFFECTIVE AREA(ACRES) =   8549.97     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =    10030.5         PEAK FLOW RATE(CFS) =    9079.88
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.04

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.04   FLOW VELOCITY(FEET/SEC.) =  15.05
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10621.00 =   40157.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1584.84  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2923.79   CHANNEL SLOPE =  0.0482
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.03
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.382
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      160.90      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9158.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.79
  AVERAGE FLOW DEPTH(FEET) =   9.02   TRAVEL TIME(MIN.) =   2.74
  Tc(MIN.) =   54.43
  SUBAREA AREA(ACRES) =   160.90       SUBAREA RUNOFF(CFS) =  156.67
  EFFECTIVE AREA(ACRES) =   8710.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10191.4         PEAK FLOW RATE(CFS) =    9079.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.98   FLOW VELOCITY(FEET/SEC.) =  17.74
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   54.43
  RAINFALL INTENSITY(INCH/HR) =   1.38
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    8710.87
  TOTAL STREAM AREA(ACRES) =   10191.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    9079.88

****************************************************************************
  FLOW PROCESS FROM NODE  10630.00 TO NODE  10631.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.79
  ELEVATION DATA: UPSTREAM(FEET) =   3257.00  DOWNSTREAM(FEET) =   3147.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.430
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.773
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.25      0.30     1.000     0    8.43
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.03
  TOTAL AREA(ACRES) =      1.25   PEAK FLOW RATE(CFS) =      5.03

****************************************************************************
  FLOW PROCESS FROM NODE  10631.00 TO NODE  10632.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3147.13  DOWNSTREAM(FEET) =   2774.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   640.96   CHANNEL SLOPE =  0.5817
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.950
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.75      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.15
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   1.74
  Tc(MIN.) =   10.17
  SUBAREA AREA(ACRES) =     4.75       SUBAREA RUNOFF(CFS) =   15.60
  EFFECTIVE AREA(ACRES) =      6.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      19.71
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   7.31
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10632.00 =     939.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10632.00 TO NODE  10633.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2774.29  DOWNSTREAM(FEET) =   2004.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.65   CHANNEL SLOPE =  0.4039
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.94
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.443
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED                -       79.75      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     133.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.87
  AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   2.47
  Tc(MIN.) =   12.63
  SUBAREA AREA(ACRES) =    79.75       SUBAREA RUNOFF(CFS) =  225.62
  EFFECTIVE AREA(ACRES) =     85.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       85.8          PEAK FLOW RATE(CFS) =     242.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.24   FLOW VELOCITY(FEET/SEC.) =  15.69
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10633.00 =    2845.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10633.00 TO NODE  10634.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.58  DOWNSTREAM(FEET) =   1714.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1868.05   CHANNEL SLOPE =  0.1550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.19
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.956
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      124.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     391.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.05
  AVERAGE FLOW DEPTH(FEET) =   2.11   TRAVEL TIME(MIN.) =   2.39
  Tc(MIN.) =   15.02
  SUBAREA AREA(ACRES) =   124.45       SUBAREA RUNOFF(CFS) =  297.48
  EFFECTIVE AREA(ACRES) =    210.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      210.2         PEAK FLOW RATE(CFS) =     502.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.42   FLOW VELOCITY(FEET/SEC.) =  14.02
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10634.00 =    4713.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1714.99  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.34   CHANNEL SLOPE =  0.1609
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.52
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.755
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       42.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     548.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.58
  AVERAGE FLOW DEPTH(FEET) =   2.51   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   16.95
  SUBAREA AREA(ACRES) =    42.00       SUBAREA RUNOFF(CFS) =   92.79
  EFFECTIVE AREA(ACRES) =    252.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.2         PEAK FLOW RATE(CFS) =     557.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.53   FLOW VELOCITY(FEET/SEC.) =  14.62
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10640.00 =    6398.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.95
  RAINFALL INTENSITY(INCH/HR) =   2.75
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     252.20
  TOTAL STREAM AREA(ACRES) =     252.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     557.19

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     8310.84   28.12    1.945  0.30( 0.30) 1.00    4746.0   10600.00
      1     8708.82   34.91    1.722  0.30( 0.30) 1.00    5909.8   10500.00
      1     8994.22   41.16    1.550  0.30( 0.30) 1.00    6907.4   10410.00
      1     9038.88   52.20    1.395  0.30( 0.30) 1.00    8441.1   10400.00
      1     9079.88   54.43    1.382  0.30( 0.30) 1.00    8710.9   10200.00
      1     9043.22   60.02    1.349  0.30( 0.30) 1.00    9290.2   10300.00
      1     9039.33   60.20    1.348  0.30( 0.30) 1.00    9302.9   10320.00
      1     8862.35   64.63    1.317  0.30( 0.30) 1.00    9494.8   10210.00
      1     8165.64   89.65    1.142  0.30( 0.30) 1.00   10191.4   10100.00
```

```
    2      557.19   16.95    2.755  0.30( 0.30) 1.00     252.2   10630.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     8028.60   16.95    2.755  0.30( 0.30) 1.00    3112.3   10630.00
      2     8684.32   28.12    1.945  0.30( 0.30) 1.00    4998.2   10600.00
      3     9031.66   34.91    1.722  0.30( 0.30) 1.00    6162.0   10500.00
      4     9277.85   41.16    1.550  0.30( 0.30) 1.00    7159.6   10410.00
      5     9287.45   52.20    1.395  0.30( 0.30) 1.00    8693.3   10400.00
      6     9325.46   54.43    1.382  0.30( 0.30) 1.00    8963.1   10200.00
      7     9281.30   60.02    1.349  0.30( 0.30) 1.00    9542.4   10300.00
      8     9277.13   60.20    1.348  0.30( 0.30) 1.00    9555.1   10320.00
      9     9093.16   64.63    1.317  0.30( 0.30) 1.00    9747.0   10210.00
     10     8356.87   89.65    1.142  0.30( 0.30) 1.00   10443.6   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    9325.46    Tc(MIN.) =    54.43
  EFFECTIVE AREA(ACRES) =    8963.07   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    10443.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1443.87  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2254.45   CHANNEL SLOPE =  0.0548
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.85
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.370
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9370.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.76
  AVERAGE FLOW DEPTH(FEET) =   8.84   TRAVEL TIME(MIN.) =   2.00
  Tc(MIN.) =   56.43
  SUBAREA AREA(ACRES) =    94.37       SUBAREA RUNOFF(CFS) =   90.89
  EFFECTIVE AREA(ACRES) =   9057.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10538.0         PEAK FLOW RATE(CFS) =    9325.46
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
  DEPTH(FEET) =  8.82   FLOW VELOCITY(FEET/SEC.) =  18.72
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    10538.0  TC(MIN.) =     56.43
  EFFECTIVE AREA(ACRES) =   9057.44  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    9325.46

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     8028.60   19.03    2.537  0.30( 0.30) 1.00    3206.7   10630.00
      2     8684.32   30.16    1.866  0.30( 0.30) 1.00    5092.6   10600.00
      3     9031.66   36.93    1.661  0.30( 0.30) 1.00    6256.3   10500.00
      4     9277.85   43.16    1.517  0.30( 0.30) 1.00    7254.0   10410.00
      5     9287.45   54.20    1.383  0.30( 0.30) 1.00    8787.7   10400.00
      6     9325.46   56.43    1.370  0.30( 0.30) 1.00    9057.4   10200.00
      7     9281.30   62.03    1.335  0.30( 0.30) 1.00    9636.7   10300.00
      8     9277.13   62.21    1.334  0.30( 0.30) 1.00    9649.4   10320.00
      9     9093.16   66.64    1.303  0.30( 0.30) 1.00    9841.4   10210.00
     10     8356.87   91.72    1.133  0.30( 0.30) 1.00   10538.0   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S7.DAT
  TIME/DATE OF STUDY: 10:06 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.496
   2)   10.00;  3.984
   3)   15.00;  2.958
   4)   20.00;  2.436
   5)   25.00;  2.069
   6)   30.00;  1.871
   7)   40.00;  1.568
   8)   50.00;  1.408
   9)   60.00;  1.349
  10)   90.00;  1.140
  11)  120.00;  1.010
  12)  180.00;  0.906
  13)  360.00;  0.702
  14) 1440.00;  0.318
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10700.00 TO NODE  10701.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   281.18
  ELEVATION DATA: UPSTREAM(FEET) =   3512.68  DOWNSTREAM(FEET) =   3444.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.938
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.517
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.30      0.30     1.000      0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.93
  TOTAL AREA(ACRES) =      1.30   PEAK FLOW RATE(CFS) =      4.93

**************************************************************************
  FLOW PROCESS FROM NODE  10701.00 TO NODE  10702.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3444.33  DOWNSTREAM(FEET) =   3246.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   700.05   CHANNEL SLOPE =  0.2823
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.750
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.49      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.30
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =   11.14
  SUBAREA AREA(ACRES) =     6.49       SUBAREA RUNOFF(CFS) =   20.15
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8          PEAK FLOW RATE(CFS) =      24.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   6.35
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10702.00 =     981.23 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10702.00 TO NODE  10703.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3246.68  DOWNSTREAM(FEET) =   3075.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1893.56   CHANNEL SLOPE =  0.0906
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.816
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.98      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.04
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   5.22
  Tc(MIN.) =   16.36
  SUBAREA AREA(ACRES) =    31.98       SUBAREA RUNOFF(CFS) =   72.41
  EFFECTIVE AREA(ACRES) =     39.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       39.8         PEAK FLOW RATE(CFS) =      90.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.08   FLOW VELOCITY(FEET/SEC.) =   6.87
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.00 =    2874.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.00 TO NODE  10703.50 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3075.14  DOWNSTREAM(FEET) =   2952.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2060.61   CHANNEL SLOPE =  0.0597
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.49
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.319
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.58      0.30     0.872     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.872
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     122.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.56
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   5.24
  Tc(MIN.) =   21.60
  SUBAREA AREA(ACRES) =    34.58       SUBAREA RUNOFF(CFS) =   64.03
  EFFECTIVE AREA(ACRES) =     74.35     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       74.4         PEAK FLOW RATE(CFS) =     136.29
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.54   FLOW VELOCITY(FEET/SEC.) =   6.79
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.50 =    4935.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.50 TO NODE  10704.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2952.03  DOWNSTREAM(FEET) =   2895.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.70   CHANNEL SLOPE =  0.0606
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.70
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.161
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.69      0.30     0.951     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     162.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.21
  AVERAGE FLOW DEPTH(FEET) =   1.68   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   23.75
  SUBAREA AREA(ACRES) =    30.69       SUBAREA RUNOFF(CFS) =   51.81
  EFFECTIVE AREA(ACRES) =    105.04     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      105.0         PEAK FLOW RATE(CFS) =     177.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =   7.39
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10704.00 =    5866.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2895.59  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2585.44   CHANNEL SLOPE =  0.1217
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.11
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.968
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.40      0.30     0.977     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     328.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.35
  AVERAGE FLOW DEPTH(FEET) =   2.05   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   27.54
  SUBAREA AREA(ACRES) =   199.40       SUBAREA RUNOFF(CFS) =  300.64
  EFFECTIVE AREA(ACRES) =    304.44     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      304.4          PEAK FLOW RATE(CFS) =     459.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.46   FLOW VELOCITY(FEET/SEC.) =  12.53
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.54
  RAINFALL INTENSITY(INCH/HR) =   1.97
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     304.44
  TOTAL STREAM AREA(ACRES) =     304.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     459.95

****************************************************************************
  FLOW PROCESS FROM NODE  10710.00 TO NODE  10711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.64
  ELEVATION DATA: UPSTREAM(FEET) =   3389.13  DOWNSTREAM(FEET) =   3276.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.438
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.689
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK               -        7.76      0.30     0.981     0   11.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.981
  SUBAREA RUNOFF(CFS) =     23.71
  TOTAL AREA(ACRES) =      7.76   PEAK FLOW RATE(CFS) =     23.71

****************************************************************************
  FLOW PROCESS FROM NODE  10711.00 TO NODE  10712.00 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3276.30  DOWNSTREAM(FEET) =   3152.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   950.69   CHANNEL SLOPE =  0.1305
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.75
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.188
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       22.39      0.30     0.988     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.988
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.49
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =   13.88
  SUBAREA AREA(ACRES) =    22.39       SUBAREA RUNOFF(CFS) =   58.27
  EFFECTIVE AREA(ACRES) =     30.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       30.1          PEAK FLOW RATE(CFS) =      78.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   7.41
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10712.00 =    1894.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10712.00 TO NODE  10713.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3152.26  DOWNSTREAM(FEET) =   2879.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.77   CHANNEL SLOPE =  0.1431
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.702
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       42.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     124.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.91
  AVERAGE FLOW DEPTH(FEET) =   1.14   TRAVEL TIME(MIN.) =   3.57
  Tc(MIN.) =   17.45
  SUBAREA AREA(ACRES) =    42.59       SUBAREA RUNOFF(CFS) =   92.08
  EFFECTIVE AREA(ACRES) =     72.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       72.7          PEAK FLOW RATE(CFS) =     157.37
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =   9.59
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10713.00 =    3804.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.03  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2621.96   CHANNEL SLOPE =  0.1136
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.327
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      156.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     300.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.82
  AVERAGE FLOW DEPTH(FEET) =   1.99   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   21.49
  SUBAREA AREA(ACRES) =   156.72       SUBAREA RUNOFF(CFS) =  285.87
  EFFECTIVE AREA(ACRES) =    229.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      229.5         PEAK FLOW RATE(CFS) =     418.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.38   FLOW VELOCITY(FEET/SEC.) =  11.90
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10720.00 =    6426.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.49
  RAINFALL INTENSITY(INCH/HR) =   2.33
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     229.46
  TOTAL STREAM AREA(ACRES) =     229.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     418.67
```



```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      459.95   27.54    1.968  0.30( 0.29) 0.97     304.4   10700.00
      2      418.67   21.49    2.327  0.30( 0.30) 1.00     229.5   10710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      854.13   21.49    2.327  0.30( 0.29) 0.98     467.0   10710.00
      2      804.60   27.54    1.968  0.30( 0.29) 0.98     533.9   10700.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     854.13    Tc(MIN.) =    21.49
  EFFECTIVE AREA(ACRES) =     466.98   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =      533.9
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.00 TO NODE  10720.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.07  DOWNSTREAM(FEET) =   2523.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.13   CHANNEL SLOPE =  0.0339
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.98
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.111
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     948.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.62
  AVERAGE FLOW DEPTH(FEET) =   4.95   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   24.43
  SUBAREA AREA(ACRES) =   116.31       SUBAREA RUNOFF(CFS) =  189.54
  EFFECTIVE AREA(ACRES) =    583.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      650.2         PEAK FLOW RATE(CFS) =     952.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.96   FLOW VELOCITY(FEET/SEC.) =   9.63
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.50 =   10150.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.50 TO NODE  10721.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2523.48  DOWNSTREAM(FEET) =   2488.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1575.08   CHANNEL SLOPE =  0.0221
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.69
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.967
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1014.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.36
  AVERAGE FLOW DEPTH(FEET) =   5.68   TRAVEL TIME(MIN.) =   3.14
  Tc(MIN.) =   27.57
  SUBAREA AREA(ACRES) =    82.28       SUBAREA RUNOFF(CFS) =  123.46
  EFFECTIVE AREA(ACRES) =    665.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      732.5         PEAK FLOW RATE(CFS) =    1001.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.64   FLOW VELOCITY(FEET/SEC.) =   8.34
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.00 =   11725.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.00 TO NODE  10721.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2488.66  DOWNSTREAM(FEET) =   2453.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2032.11   CHANNEL SLOPE =  0.0174
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.51
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.816
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      259.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1178.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.96
  AVERAGE FLOW DEPTH(FEET) =   6.46   TRAVEL TIME(MIN.) =   4.26
  Tc(MIN.) =   31.83
  SUBAREA AREA(ACRES) =   259.52       SUBAREA RUNOFF(CFS) =  354.02
  EFFECTIVE AREA(ACRES) =    925.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      992.0         PEAK FLOW RATE(CFS) =    1264.28
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.68   FLOW VELOCITY(FEET/SEC.) =   8.10
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.50 =   13757.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.50 TO NODE  10722.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.35  DOWNSTREAM(FEET) =   2384.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1842.37   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.89
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.732
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      229.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1412.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.07
  AVERAGE FLOW DEPTH(FEET) =   5.87   TRAVEL TIME(MIN.) =   2.77
  Tc(MIN.) =   34.60
  SUBAREA AREA(ACRES) =   229.78       SUBAREA RUNOFF(CFS) =  296.07
  EFFECTIVE AREA(ACRES) =   1154.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1221.8         PEAK FLOW RATE(CFS) =    1490.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.02   FLOW VELOCITY(FEET/SEC.) =  11.23
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10722.00 =   15600.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10722.00 TO NODE  10723.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2384.52  DOWNSTREAM(FEET) =   1925.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3780.37   CHANNEL SLOPE =  0.1214
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.80
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.625
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      308.58      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1674.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.87
  AVERAGE FLOW DEPTH(FEET) =   4.79   TRAVEL TIME(MIN.) =   3.53
  Tc(MIN.) =   38.13
  SUBAREA AREA(ACRES) =   308.58       SUBAREA RUNOFF(CFS) =  367.93
  EFFECTIVE AREA(ACRES) =   1463.45     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1530.4          PEAK FLOW RATE(CFS) =    1747.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.89   FLOW VELOCITY(FEET/SEC.) =  18.08
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10723.00 =   19380.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1925.64  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3826.73   CHANNEL SLOPE =  0.1582
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.90
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.549
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      434.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1991.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.65
  AVERAGE FLOW DEPTH(FEET) =   4.88   TRAVEL TIME(MIN.) =   3.09
  Tc(MIN.) =   41.22
  SUBAREA AREA(ACRES) =   434.11       SUBAREA RUNOFF(CFS) =  487.84
  EFFECTIVE AREA(ACRES) =   1897.56     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1964.5          PEAK FLOW RATE(CFS) =    2134.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.05   FLOW VELOCITY(FEET/SEC.) =  21.01
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1964.5  TC(MIN.) =     41.22
  EFFECTIVE AREA(ACRES) =   1897.56  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.995
  PEAK FLOW RATE(CFS)   =    2134.73
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     2134.73   41.22    1.549  0.30( 0.30) 1.00    1897.6   10710.00
      2     2030.35   47.59    1.447  0.30( 0.30) 0.99    1964.5   10700.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S8.DAT
  TIME/DATE OF STUDY: 10:06 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
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                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.304
   2)   10.00;  3.893
   3)   15.00;  2.905
   4)   20.00;  2.398
   5)   25.00;  2.043
   6)   30.00;  1.845
   7)   40.00;  1.549
   8)   50.00;  1.389
   9)   60.00;  1.322
  10)   90.00;  1.114
  11)  120.00;  0.984
  12)  180.00;  0.877
  13)  360.00;  0.675
  14) 1440.00;  0.304
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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  FLOW PROCESS FROM NODE  10800.00 TO NODE  10801.00 IS CODE =  21
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  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.93
  ELEVATION DATA: UPSTREAM(FEET) =   2617.19  DOWNSTREAM(FEET) =   2506.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.540
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  5.079
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.83      0.30     1.000      0    7.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.57
  TOTAL AREA(ACRES) =      0.83   PEAK FLOW RATE(CFS) =      3.57

****************************************************************************
  FLOW PROCESS FROM NODE  10801.00 TO NODE  10802.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2506.15  DOWNSTREAM(FEET) =   2237.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.01   CHANNEL SLOPE =  0.3968
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.082
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.30      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.46
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   2.07
  Tc(MIN.) =    9.61
  SUBAREA AREA(ACRES) =     5.30       SUBAREA RUNOFF(CFS) =   18.04
  EFFECTIVE AREA(ACRES) =      6.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =      20.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   6.69
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10802.00 =     925.94 FEET.

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  FLOW PROCESS FROM NODE  10802.00 TO NODE  10803.00 IS CODE =  56
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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2237.54  DOWNSTREAM(FEET) =   1920.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =   954.74   CHANNEL SLOPE =  0.3325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.600
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.48
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   1.88
  Tc(MIN.) =   11.48
  SUBAREA AREA(ACRES) =    18.25       SUBAREA RUNOFF(CFS) =   54.20
  EFFECTIVE AREA(ACRES) =     24.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.4         PEAK FLOW RATE(CFS) =      72.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   9.83
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10803.00 =    1880.68 FEET.

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  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1920.11  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2201.18   CHANNEL SLOPE =  0.2865
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.016
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.99      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     169.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.42
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   2.95
  Tc(MIN.) =   14.44
  SUBAREA AREA(ACRES) =    78.99       SUBAREA RUNOFF(CFS) =  193.10
  EFFECTIVE AREA(ACRES) =    103.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      103.4         PEAK FLOW RATE(CFS) =     252.70
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.40   FLOW VELOCITY(FEET/SEC.) =  14.11
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

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  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
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  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S6.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     8028.60   19.03  0.30( 0.30) 1.00    3206.7   10630.00
      2     8684.32   30.16  0.30( 0.30) 1.00    5092.6   10600.00
      3     9031.66   36.93  0.30( 0.30) 1.00    6256.3   10500.00
      4     9277.85   43.16  0.30( 0.30) 1.00    7254.0   10410.00
      5     9287.45   54.20  0.30( 0.30) 1.00    8787.7   10400.00
      6     9325.46   56.43  0.30( 0.30) 1.00    9057.4   10200.00
      7     9281.30   62.03  0.30( 0.30) 1.00    9636.7   10300.00
      8     9277.13   62.21  0.30( 0.30) 1.00    9649.4   10320.00
      9     9093.16   66.64  0.30( 0.30) 1.00    9841.4   10210.00
     10     8356.87   91.72  0.30( 0.30) 1.00   10538.0   10100.00
    TOTAL AREA(ACRES) =    10538.0

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S7.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2134.73   41.22  0.30( 0.30) 1.00    1897.6   10710.00
      2     2030.35   47.59  0.30( 0.30) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =     1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
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  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2134.73   41.22  0.30( 0.30) 1.00    1897.6   10710.00
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      2     2030.35   47.59  0.30( 0.30) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =      1964.5

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  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
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  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2134.73   41.22    1.530  0.30( 0.30) 1.00    1897.6   10710.00
      2     2030.35   47.59    1.428  0.30( 0.30) 0.99    1964.5   10700.00
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     8028.60   19.03    2.496  0.30( 0.30) 1.00    3206.7   10630.00
      2     8684.32   30.16    1.840  0.30( 0.30) 1.00    5092.6   10600.00
      3     9031.66   36.93    1.640  0.30( 0.30) 1.00    6256.3   10500.00
      4     9277.85   43.16    1.498  0.30( 0.30) 1.00    7254.0   10410.00
      5     9287.45   54.20    1.361  0.30( 0.30) 1.00    8787.7   10400.00
      6     9325.46   56.43    1.346  0.30( 0.30) 1.00    9057.4   10200.00
      7     9281.30   62.03    1.308  0.30( 0.30) 1.00    9636.7   10300.00
      8     9277.13   62.21    1.307  0.30( 0.30) 1.00    9649.4   10320.00
      9     9093.16   66.64    1.276  0.30( 0.30) 1.00    9841.4   10210.00
     10     8356.87   91.72    1.107  0.30( 0.30) 1.00   10538.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9788.38   19.03    2.496  0.30( 0.30) 1.00    4082.9   10630.00
      2    10640.79   30.16    1.840  0.30( 0.30) 1.00    6481.2   10600.00
      3    11115.84   36.93    1.640  0.30( 0.30) 1.00    7956.6   10500.00
      4    11335.67   41.22    1.530  0.30( 0.30) 1.00    8839.9   10710.00
      5    11380.68   43.16    1.498  0.30( 0.30) 1.00    9172.0   10410.00
      6    11312.04   47.59    1.428  0.30( 0.30) 1.00    9833.0   10700.00
      7    11197.75   54.20    1.361  0.30( 0.30) 1.00   10752.1   10400.00
      8    11208.85   56.43    1.346  0.30( 0.30) 1.00   11021.9   10200.00
      9    11096.46   62.03    1.308  0.30( 0.30) 1.00   11601.2   10300.00
     10    11090.05   62.21    1.307  0.30( 0.30) 1.00   11613.9   10320.00
     11    10850.80   66.64    1.276  0.30( 0.30) 1.00   11805.8   10210.00
     12     9810.01   91.72    1.107  0.30( 0.30) 1.00   12502.4   10100.00
    TOTAL AREA(ACRES) =     12502.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    11380.68  Tc(MIN.) =   43.162
  EFFECTIVE AREA(ACRES) =   9172.03  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12502.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

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  FLOW PROCESS FROM NODE  10724.00 TO NODE  10820.00 IS CODE =  56
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
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  ELEVATION DATA: UPSTREAM(FEET) =   1320.32  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1341.06   CHANNEL SLOPE =  0.0231
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.01
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.474
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   11405.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.39
  AVERAGE FLOW DEPTH(FEET) =  12.01   TRAVEL TIME(MIN.) =   1.55
  Tc(MIN.) =   44.72
  SUBAREA AREA(ACRES) =    47.66       SUBAREA RUNOFF(CFS) =   50.34
  EFFECTIVE AREA(ACRES) =   9219.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12550.1          PEAK FLOW RATE(CFS) =   11380.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.99   FLOW VELOCITY(FEET/SEC.) =  14.39
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
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  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9788.38   20.65    2.352  0.30( 0.30) 1.00    4130.5   10630.00
      2    10640.79   31.74    1.793  0.30( 0.30) 1.00    6528.9   10600.00
      3    11115.84   38.49    1.594  0.30( 0.30) 1.00    8004.2   10500.00
      4    11335.67   42.77    1.505  0.30( 0.30) 1.00    8887.6   10710.00
      5    11380.68   44.72    1.474  0.30( 0.30) 1.00    9219.7   10410.00
      6    11312.04   49.14    1.403  0.30( 0.30) 1.00    9880.7   10700.00
      7    11197.75   55.76    1.350  0.30( 0.30) 1.00   10799.8   10400.00
      8    11208.85   57.99    1.335  0.30( 0.30) 1.00   11069.6   10200.00
      9    11096.46   63.59    1.297  0.30( 0.30) 1.00   11648.9   10300.00
     10    11090.05   63.77    1.296  0.30( 0.30) 1.00   11661.6   10320.00
     11    10850.80   68.22    1.265  0.30( 0.30) 1.00   11853.5   10210.00
     12     9810.01   93.33    1.100  0.30( 0.30) 1.00   12550.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
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      1      252.70   14.44    3.016  0.30( 0.30) 1.00     103.4   10800.00
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9311.79   14.44    3.016  0.30( 0.30) 1.00    2991.8   10800.00
      2     9979.30   20.65    2.352  0.30( 0.30) 1.00    4233.9   10630.00
      3    10779.73   31.74    1.793  0.30( 0.30) 1.00    6632.3   10600.00
      4    11236.20   38.49    1.594  0.30( 0.30) 1.00    8107.6   10500.00
      5    11447.76   42.77    1.505  0.30( 0.30) 1.00    8991.0   10710.00
      6    11489.86   44.72    1.474  0.30( 0.30) 1.00    9323.1   10410.00
      7    11414.64   49.14    1.403  0.30( 0.30) 1.00    9984.1   10700.00
      8    11295.47   55.76    1.350  0.30( 0.30) 1.00   10903.2   10400.00
      9    11305.19   57.99    1.335  0.30( 0.30) 1.00   11173.0   10200.00
     10    11189.23   63.59    1.297  0.30( 0.30) 1.00   11752.2   10300.00
     11    11182.71   63.77    1.296  0.30( 0.30) 1.00   11765.0   10320.00
     12    10940.58   68.22    1.265  0.30( 0.30) 1.00   11956.9   10210.00
     13     9884.41   93.33    1.100  0.30( 0.30) 1.00   12653.5   10100.00
    TOTAL AREA(ACRES) =     12653.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    11489.86  Tc(MIN.) =   44.715
  EFFECTIVE AREA(ACRES) =   9323.06  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12653.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1289.38  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2450.84   CHANNEL SLOPE =  0.0332
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.08
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.434
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   11564.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.50
  AVERAGE FLOW DEPTH(FEET) =  11.08   TRAVEL TIME(MIN.) =   2.48
  Tc(MIN.) =   47.19
  SUBAREA AREA(ACRES) =   147.19       SUBAREA RUNOFF(CFS) =  150.22
  EFFECTIVE AREA(ACRES) =   9470.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12800.7         PEAK FLOW RATE(CFS) =   11489.86
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.04
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.04   FLOW VELOCITY(FEET/SEC.) =  16.48
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   47.19
  RAINFALL INTENSITY(INCH/HR) =   1.43
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    9470.25
  TOTAL STREAM AREA(ACRES) =   12800.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   11489.86

****************************************************************************
  FLOW PROCESS FROM NODE  10830.00 TO NODE  10831.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.89
  ELEVATION DATA: UPSTREAM(FEET) =   3249.56  DOWNSTREAM(FEET) =   3166.67

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.939
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.405
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.88      0.30     1.000     0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.25
  TOTAL AREA(ACRES) =      0.88   PEAK FLOW RATE(CFS) =      3.25

****************************************************************************
  FLOW PROCESS FROM NODE  10831.00 TO NODE  10832.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3166.67  DOWNSTREAM(FEET) =   2954.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.65   CHANNEL SLOPE =  0.3126
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.19
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.566
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -        2.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.16
  AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   2.71
  Tc(MIN.) =   11.65
  SUBAREA AREA(ACRES) =     2.82       SUBAREA RUNOFF(CFS) =    8.29
  EFFECTIVE AREA(ACRES) =      3.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =      10.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   4.82
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10832.00 =     977.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10832.00 TO NODE  10833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2954.84  DOWNSTREAM(FEET) =   2765.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.35   CHANNEL SLOPE =  0.1995
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.64
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.133
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       29.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.23
  AVERAGE FLOW DEPTH(FEET) =   0.60   TRAVEL TIME(MIN.) =   2.19
  Tc(MIN.) =   13.85
  SUBAREA AREA(ACRES) =    29.25       SUBAREA RUNOFF(CFS) =   74.58
  EFFECTIVE AREA(ACRES) =     32.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      84.01
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   8.72
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10833.00 =    1928.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10833.00 TO NODE  10834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2765.08  DOWNSTREAM(FEET) =   2446.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.29   CHANNEL SLOPE =  0.1628
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.38
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.701
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     171.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.30
  AVERAGE FLOW DEPTH(FEET) =   1.32   TRAVEL TIME(MIN.) =   3.17
  Tc(MIN.) =   17.02
  SUBAREA AREA(ACRES) =    80.66       SUBAREA RUNOFF(CFS) =  174.27
  EFFECTIVE AREA(ACRES) =    113.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.6         PEAK FLOW RATE(CFS) =     245.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =  11.51
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10834.00 =    3888.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10834.00 TO NODE  10835.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2446.09  DOWNSTREAM(FEET) =   1797.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2083.04   CHANNEL SLOPE =  0.3113
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.497
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      196.68      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     440.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.26
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =   19.03
  SUBAREA AREA(ACRES) =   196.68       SUBAREA RUNOFF(CFS) =  388.84
  EFFECTIVE AREA(ACRES) =    310.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      310.3         PEAK FLOW RATE(CFS) =     613.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.23
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.23   FLOW VELOCITY(FEET/SEC.) =  19.02
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10835.00 =    5971.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1797.70  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3213.25   CHANNEL SLOPE =  0.1835
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.02
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.244
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      218.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     805.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.04
  AVERAGE FLOW DEPTH(FEET) =   2.96   TRAVEL TIME(MIN.) =   3.14
  Tc(MIN.) =   22.17
  SUBAREA AREA(ACRES) =   218.82       SUBAREA RUNOFF(CFS) =  382.85
  EFFECTIVE AREA(ACRES) =    529.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      529.1         PEAK FLOW RATE(CFS) =     925.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.19   FLOW VELOCITY(FEET/SEC.) =  17.70
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10840.00 =    9184.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.17
  RAINFALL INTENSITY(INCH/HR) =   2.24
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     529.11
  TOTAL STREAM AREA(ACRES) =     529.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     925.74

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9311.79   17.05    2.698  0.30( 0.30) 1.00    3139.0   10800.00
      1     9979.30   23.21    2.170  0.30( 0.30) 1.00    4381.1   10630.00
      1    10779.73   34.26    1.719  0.30( 0.30) 1.00    6779.5   10600.00
      1    11236.20   40.98    1.533  0.30( 0.30) 1.00    8254.8   10500.00
      1    11447.76   45.25    1.465  0.30( 0.30) 1.00    9138.1   10710.00
      1    11489.86   47.19    1.434  0.30( 0.30) 1.00    9470.2   10410.00
      1    11414.64   51.62    1.378  0.30( 0.30) 1.00   10131.2   10700.00
      1    11295.47   58.25    1.334  0.30( 0.30) 1.00   11050.4   10400.00
      1    11305.19   60.48    1.319  0.30( 0.30) 1.00   11320.1   10200.00
      1    11189.23   66.08    1.280  0.30( 0.30) 1.00   11899.4   10300.00
      1    11182.71   66.27    1.279  0.30( 0.30) 1.00   11912.1   10320.00
      1    10940.58   70.72    1.248  0.30( 0.30) 1.00   12104.1   10210.00
      1     9884.41   95.91    1.088  0.30( 0.30) 1.00   12800.7   10100.00
      2      925.74   22.17    2.244  0.30( 0.30) 1.00     529.1   10830.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10189.65   17.05    2.698  0.30( 0.30) 1.00    3545.9   10800.00
      2    10792.26   22.17    2.244  0.30( 0.30) 1.00    4700.4   10830.00
      3    10869.82   23.21    2.170  0.30( 0.30) 1.00    4910.2   10630.00
      4    11455.49   34.26    1.719  0.30( 0.30) 1.00    7308.6   10600.00
      5    11823.54   40.98    1.533  0.30( 0.30) 1.00    8783.9   10500.00
      6    12002.59   45.25    1.465  0.30( 0.30) 1.00    9667.3   10710.00
      7    12029.88   47.19    1.434  0.30( 0.30) 1.00    9999.4   10410.00
      8    11928.09   51.62    1.378  0.30( 0.30) 1.00   10660.4   10700.00
      9    11787.78   58.25    1.334  0.30( 0.30) 1.00   11579.5   10400.00
     10    11790.31   60.48    1.319  0.30( 0.30) 1.00   11849.3   10200.00
     11    11655.85   66.08    1.280  0.30( 0.30) 1.00   12428.5   10300.00
     12    11648.73   66.27    1.279  0.30( 0.30) 1.00   12441.3   10320.00
     13    11391.89   70.72    1.248  0.30( 0.30) 1.00   12633.2   10210.00
     14    10259.87   95.91    1.088  0.30( 0.30) 1.00   13329.8   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   12029.88    Tc(MIN.) =    47.19
  EFFECTIVE AREA(ACRES) =    9999.36   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    13329.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10840.00 TO NODE  10841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1208.07  DOWNSTREAM(FEET) =   1119.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3050.12   CHANNEL SLOPE =  0.0292
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.71
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.386
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      222.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   12138.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.95
  AVERAGE FLOW DEPTH(FEET) =  11.69   TRAVEL TIME(MIN.) =   3.19
  Tc(MIN.) =   50.38
  SUBAREA AREA(ACRES) =   222.84       SUBAREA RUNOFF(CFS) =  217.91
  EFFECTIVE AREA(ACRES) =  10222.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13552.6         PEAK FLOW RATE(CFS) =   12029.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.64   FLOW VELOCITY(FEET/SEC.) =  15.92
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10841.00 =   52177.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1119.03  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.14   CHANNEL SLOPE =  0.0238
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.30
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.377
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      265.26      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   12158.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.80
  AVERAGE FLOW DEPTH(FEET) =  12.29   TRAVEL TIME(MIN.) =   1.48
  Tc(MIN.) =   51.86
  SUBAREA AREA(ACRES) =   265.26       SUBAREA RUNOFF(CFS) =  257.02
  EFFECTIVE AREA(ACRES) =  10487.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13817.9         PEAK FLOW RATE(CFS) =   12029.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.23   FLOW VELOCITY(FEET/SEC.) =  14.75
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =   1
```



```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   51.86
  RAINFALL INTENSITY(INCH/HR) =   1.38
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   10487.46
  TOTAL STREAM AREA(ACRES) =   13817.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   12029.88

****************************************************************************
  FLOW PROCESS FROM NODE  10850.00 TO NODE  10851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   311.88
  ELEVATION DATA: UPSTREAM(FEET) =   3029.66  DOWNSTREAM(FEET) =   2922.38

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.691
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.524
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.73      0.30     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.38
  TOTAL AREA(ACRES) =      2.73   PEAK FLOW RATE(CFS) =     10.38

****************************************************************************
  FLOW PROCESS FROM NODE  10851.00 TO NODE  10852.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2922.38  DOWNSTREAM(FEET) =   2684.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =   687.05   CHANNEL SLOPE =  0.3461
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.30
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.778
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.06
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.89
  Tc(MIN.) =   10.58
```

```
  SUBAREA AREA(ACRES) =     5.11       SUBAREA RUNOFF(CFS) =   16.00
  EFFECTIVE AREA(ACRES) =      7.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      24.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   6.75
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10852.00 =     998.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10852.00 TO NODE  10853.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2684.61  DOWNSTREAM(FEET) =   2306.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.58   CHANNEL SLOPE =  0.1966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.01
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.094
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     100.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.26
  AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   14.04
  SUBAREA AREA(ACRES) =    60.02       SUBAREA RUNOFF(CFS) =  150.94
  EFFECTIVE AREA(ACRES) =     67.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =     170.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) =  10.96
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10853.00 =    2923.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10853.00 TO NODE  10854.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2306.25  DOWNSTREAM(FEET) =   1555.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3225.53   CHANNEL SLOPE =  0.2329
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.08
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.648
```



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  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      235.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     420.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.37
  AVERAGE FLOW DEPTH(FEET) =   1.97   TRAVEL TIME(MIN.) =   3.50
  Tc(MIN.) =   17.54
  SUBAREA AREA(ACRES) =   235.82       SUBAREA RUNOFF(CFS) =  498.25
  EFFECTIVE AREA(ACRES) =    303.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.7         PEAK FLOW RATE(CFS) =     641.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.47   FLOW VELOCITY(FEET/SEC.) =  17.40
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10854.00 =    6149.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1555.12  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3294.22   CHANNEL SLOPE =  0.1419
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.37
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.327
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      247.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     867.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.84
  AVERAGE FLOW DEPTH(FEET) =   3.30   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   21.01
  SUBAREA AREA(ACRES) =   247.64       SUBAREA RUNOFF(CFS) =  451.69
  EFFECTIVE AREA(ACRES) =    551.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      551.3         PEAK FLOW RATE(CFS) =    1005.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.56   FLOW VELOCITY(FEET/SEC.) =  16.50
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10860.00 =    9443.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =   1
```

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------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.01
  RAINFALL INTENSITY(INCH/HR) =   2.33
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     551.32
  TOTAL STREAM AREA(ACRES) =     551.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1005.60

  ** CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    10189.65   21.91    2.262  0.30( 0.30) 1.00    4034.0   10800.00
      1    10792.26   26.97    1.965  0.30( 0.30) 1.00    5188.5   10830.00
      1    10869.82   28.00    1.924  0.30( 0.30) 1.00    5398.3   10630.00
      1    11455.49   38.99    1.579  0.30( 0.30) 1.00    7796.7   10600.00
      1    11823.54   45.67    1.458  0.30( 0.30) 1.00    9272.0   10500.00
      1    12002.59   49.92    1.390  0.30( 0.30) 1.00   10155.4   10710.00
      1    12029.88   51.86    1.377  0.30( 0.30) 1.00   10487.5   10410.00
      1    11928.09   56.30    1.347  0.30( 0.30) 1.00   11148.5   10700.00
      1    11787.78   62.94    1.302  0.30( 0.30) 1.00   12067.6   10400.00
      1    11790.31   65.18    1.286  0.30( 0.30) 1.00   12337.4   10200.00
      1    11655.85   70.79    1.247  0.30( 0.30) 1.00   12916.6   10300.00
      1    11648.73   70.98    1.246  0.30( 0.30) 1.00   12929.4   10320.00
      1    11391.89   75.46    1.215  0.30( 0.30) 1.00   13121.3   10210.00
      1    10259.87  100.78    1.067  0.30( 0.30) 1.00   13817.9   10100.00
      2     1005.60   21.01    2.327  0.30( 0.30) 1.00     551.3   10850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11094.06   21.01    2.327  0.30( 0.30) 1.00    4418.4   10850.00
      2    11163.33   21.91    2.262  0.30( 0.30) 1.00    4585.3   10800.00
      3    11618.47   26.97    1.965  0.30( 0.30) 1.00    5739.8   10830.00
      4    11675.74   28.00    1.924  0.30( 0.30) 1.00    5949.6   10630.00
      5    12090.17   38.99    1.579  0.30( 0.30) 1.00    8348.0   10600.00
      6    12398.29   45.67    1.458  0.30( 0.30) 1.00    9823.3   10500.00
      7    12543.59   49.92    1.390  0.30( 0.30) 1.00   10706.7   10710.00
      8    12564.08   51.86    1.377  0.30( 0.30) 1.00   11038.8   10410.00
      9    12447.52   56.30    1.347  0.30( 0.30) 1.00   11699.8   10700.00
     10    12284.79   62.94    1.302  0.30( 0.30) 1.00   12618.9   10400.00
     11    12279.64   65.18    1.286  0.30( 0.30) 1.00   12888.7   10200.00
     12    12125.85   70.79    1.247  0.30( 0.30) 1.00   13468.0   10300.00
     13    12118.10   70.98    1.246  0.30( 0.30) 1.00   13480.7   10320.00
     14    11845.83   75.46    1.215  0.30( 0.30) 1.00   13672.6   10210.00
     15    10640.62  100.78    1.067  0.30( 0.30) 1.00   14369.2   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   12564.08    Tc(MIN.) =    51.86
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  EFFECTIVE AREA(ACRES) =   11038.78   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    14369.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1087.70  DOWNSTREAM(FEET) =    961.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4791.22   CHANNEL SLOPE =  0.0264
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.27
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.342
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      402.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   12752.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.58
  AVERAGE FLOW DEPTH(FEET) =  12.26   TRAVEL TIME(MIN.) =   5.12
  Tc(MIN.) =   56.99
  SUBAREA AREA(ACRES) =   402.51       SUBAREA RUNOFF(CFS) =  377.57
  EFFECTIVE AREA(ACRES) =  11441.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    14771.7          PEAK FLOW RATE(CFS) =   12564.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.17   FLOW VELOCITY(FEET/SEC.) =  15.52
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    14771.7  TC(MIN.) =     56.99
  EFFECTIVE AREA(ACRES) =  11441.29  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.998
  PEAK FLOW RATE(CFS)   =   12564.08

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11094.06   26.28    1.992  0.30( 0.30) 1.00    4820.9   10850.00
      2    11163.33   27.18    1.957  0.30( 0.30) 1.00    4987.8   10800.00
      3    11618.47   32.19    1.780  0.30( 0.30) 1.00    6142.3   10830.00
      4    11675.74   33.21    1.750  0.30( 0.30) 1.00    6352.1   10630.00
      5    12090.17   44.16    1.482  0.30( 0.30) 1.00    8750.5   10600.00
      6    12398.29   50.81    1.384  0.30( 0.30) 1.00   10225.8   10500.00
      7    12543.59   55.05    1.355  0.30( 0.30) 1.00   11109.2   10710.00
      8    12564.08   56.99    1.342  0.30( 0.30) 1.00   11441.3   10410.00
      9    12447.52   61.44    1.312  0.30( 0.30) 1.00   12102.3   10700.00
```

10	12284.79	68.10	1.266	0.30(0.30)	1.00	13021.4	10400.00
11	12279.64	70.33	1.250	0.30(0.30)	1.00	13291.2	10200.00
12	12125.85	75.97	1.211	0.30(0.30)	1.00	13870.5	10300.00
13	12118.10	76.15	1.210	0.30(0.30)	1.00	13883.2	10320.00
14	11845.83	80.67	1.179	0.30(0.30)	1.00	14075.1	10210.00
15	10640.62	106.14	1.044	0.30(0.30)	1.00	14771.7	10100.00

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S9.DAT
  TIME/DATE OF STUDY: 10:06 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.304
   2)   10.00;  3.893
   3)   15.00;  2.905
   4)   20.00;  2.398
   5)   25.00;  2.043
   6)   30.00;  1.845
   7)   40.00;  1.549
   8)   50.00;  1.389
   9)   60.00;  1.322
  10)   90.00;  1.114
  11)  120.00;  0.984
  12)  180.00;  0.877
  13)  360.00;  0.675
  14) 1440.00;  0.304
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10900.00 TO NODE  10901.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   305.17
  ELEVATION DATA: UPSTREAM(FEET) =   3291.76  DOWNSTREAM(FEET) =   3104.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.671
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  5.016
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.19      0.30     1.000      0    7.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.05
  TOTAL AREA(ACRES) =      1.19   PEAK FLOW RATE(CFS) =      5.05

****************************************************************************
  FLOW PROCESS FROM NODE  10901.00 TO NODE  10902.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3104.08  DOWNSTREAM(FEET) =   2877.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   666.71   CHANNEL SLOPE =  0.3398
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.20
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.887
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        2.53      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.71
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.36
  Tc(MIN.) =   10.03
  SUBAREA AREA(ACRES) =     2.53       SUBAREA RUNOFF(CFS) =    8.17
  EFFECTIVE AREA(ACRES) =      3.72     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =      12.01
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   5.13
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10902.00 =     971.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10902.00 TO NODE  10903.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2877.50  DOWNSTREAM(FEET) =   2643.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.39   CHANNEL SLOPE =  0.1219
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.913
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.48
  AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   4.93
  Tc(MIN.) =   14.96
  SUBAREA AREA(ACRES) =    36.43       SUBAREA RUNOFF(CFS) =   85.69
  EFFECTIVE AREA(ACRES) =     40.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.2         PEAK FLOW RATE(CFS) =      94.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.02   FLOW VELOCITY(FEET/SEC.) =   7.71
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10903.00 =    2888.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10903.00 TO NODE  10904.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2643.95  DOWNSTREAM(FEET) =   2373.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.90   CHANNEL SLOPE =  0.1400
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.604
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     228.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.71
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   3.01
  Tc(MIN.) =   17.97
  SUBAREA AREA(ACRES) =   129.07       SUBAREA RUNOFF(CFS) =  267.68
  EFFECTIVE AREA(ACRES) =    169.22     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      169.2         PEAK FLOW RATE(CFS) =     350.95
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.05   FLOW VELOCITY(FEET/SEC.) =  12.16
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10904.00 =    4820.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10904.00 TO NODE  10905.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2373.49  DOWNSTREAM(FEET) =   1817.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2764.66   CHANNEL SLOPE =  0.2010
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.323
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     458.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.93
  AVERAGE FLOW DEPTH(FEET) =   2.15   TRAVEL TIME(MIN.) =   3.09
  Tc(MIN.) =   21.05
  SUBAREA AREA(ACRES) =   117.70       SUBAREA RUNOFF(CFS) =  214.35
  EFFECTIVE AREA(ACRES) =    286.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.9         PEAK FLOW RATE(CFS) =     522.51
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.30   FLOW VELOCITY(FEET/SEC.) =  15.55
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10905.00 =    7584.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10905.00 TO NODE  10906.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1817.76  DOWNSTREAM(FEET) =   1387.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2799.36   CHANNEL SLOPE =  0.1536
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.117
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      363.93      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     820.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.05
  AVERAGE FLOW DEPTH(FEET) =   3.14   TRAVEL TIME(MIN.) =   2.91
  Tc(MIN.) =   23.96
  SUBAREA AREA(ACRES) =   363.93       SUBAREA RUNOFF(CFS) =  595.14
  EFFECTIVE AREA(ACRES) =    650.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.8          PEAK FLOW RATE(CFS) =    1064.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.59   FLOW VELOCITY(FEET/SEC.) =  17.25
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10906.00 =   10384.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1387.73  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2484.63   CHANNEL SLOPE =  0.1103
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.99
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.978
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1107.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.45
  AVERAGE FLOW DEPTH(FEET) =   3.99   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   26.64
  SUBAREA AREA(ACRES) =    56.85       SUBAREA RUNOFF(CFS) =   85.86
  EFFECTIVE AREA(ACRES) =    707.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      707.7          PEAK FLOW RATE(CFS) =    1068.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.92   FLOW VELOCITY(FEET/SEC.) =  15.30
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10920.00 =   12868.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.64
  RAINFALL INTENSITY(INCH/HR) =   1.98
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     707.70
  TOTAL STREAM AREA(ACRES) =     707.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1068.88

****************************************************************************
  FLOW PROCESS FROM NODE  10910.00 TO NODE  10911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   287.29
  ELEVATION DATA: UPSTREAM(FEET) =   3119.43  DOWNSTREAM(FEET) =   3044.59

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.891
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.428
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.91      0.30     1.000     0    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.10
  TOTAL AREA(ACRES) =      1.91   PEAK FLOW RATE(CFS) =      7.10

****************************************************************************
  FLOW PROCESS FROM NODE  10911.00 TO NODE  10912.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3044.59  DOWNSTREAM(FEET) =   2980.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.50   CHANNEL SLOPE =  0.1015
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.547
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.66
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =   11.75
  SUBAREA AREA(ACRES) =     4.16       SUBAREA RUNOFF(CFS) =   12.16
  EFFECTIVE AREA(ACRES) =      6.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.1          PEAK FLOW RATE(CFS) =      17.74
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   4.09
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10912.00 =     914.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10912.00 TO NODE  10913.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2980.93  DOWNSTREAM(FEET) =   2876.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =   984.99   CHANNEL SLOPE =  0.1065
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.987
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.86      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.79
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   2.84
  Tc(MIN.) =   14.59
  SUBAREA AREA(ACRES) =    22.86       SUBAREA RUNOFF(CFS) =   55.27
  EFFECTIVE AREA(ACRES) =     28.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.9         PEAK FLOW RATE(CFS) =      69.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.89   FLOW VELOCITY(FEET/SEC.) =   6.67
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10913.00 =    1899.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10913.00 TO NODE  10914.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2876.01  DOWNSTREAM(FEET) =   2832.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   939.99   CHANNEL SLOPE =  0.0465
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.686
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.02      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     126.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   2.57
  Tc(MIN.) =   17.16
  SUBAREA AREA(ACRES) =    53.02       SUBAREA RUNOFF(CFS) =  113.87
  EFFECTIVE AREA(ACRES) =     81.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       81.9         PEAK FLOW RATE(CFS) =     176.01
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.89   FLOW VELOCITY(FEET/SEC.) =   6.74
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10914.00 =    2839.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10914.00 TO NODE  10915.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2832.29  DOWNSTREAM(FEET) =   2769.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1006.52   CHANNEL SLOPE =  0.0623
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.484
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.80      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     265.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.41
  AVERAGE FLOW DEPTH(FEET) =   2.19   TRAVEL TIME(MIN.) =   1.99
  Tc(MIN.) =   19.15
  SUBAREA AREA(ACRES) =    90.80       SUBAREA RUNOFF(CFS) =  178.49
  EFFECTIVE AREA(ACRES) =    172.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      172.8         PEAK FLOW RATE(CFS) =     339.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.50   FLOW VELOCITY(FEET/SEC.) =   9.06
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10915.00 =    3846.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10915.00 TO NODE  10916.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   2769.58  DOWNSTREAM(FEET) =   2453.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3003.36   CHANNEL SLOPE =  0.1053
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.06
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.182
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      311.96      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     604.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.86
 AVERAGE FLOW DEPTH(FEET) =   2.96   TRAVEL TIME(MIN.) =   3.89
 Tc(MIN.) =   23.04
 SUBAREA AREA(ACRES) =   311.96       SUBAREA RUNOFF(CFS) =  528.37
 EFFECTIVE AREA(ACRES) =    484.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      484.7         PEAK FLOW RATE(CFS) =     820.96
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.46

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.46   FLOW VELOCITY(FEET/SEC.) =  14.02
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10916.00 =    6849.65 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10916.00 TO NODE  10917.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2453.21  DOWNSTREAM(FEET) =   1787.18
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2846.14   CHANNEL SLOPE =  0.2340
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.16
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.025
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      238.62      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1006.30
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.76
 AVERAGE FLOW DEPTH(FEET) =   3.13   TRAVEL TIME(MIN.) =   2.40
 Tc(MIN.) =   25.44
 SUBAREA AREA(ACRES) =   238.62       SUBAREA RUNOFF(CFS) =  370.56
 EFFECTIVE AREA(ACRES) =    723.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      723.3         PEAK FLOW RATE(CFS) =    1123.27
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.31   FLOW VELOCITY(FEET/SEC.) =  20.38
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10917.00 =    9695.79 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10917.00 TO NODE  10918.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1787.18  DOWNSTREAM(FEET) =   1279.22
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2918.23   CHANNEL SLOPE =  0.1741
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.76
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.923
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      150.63      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1233.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.79
 AVERAGE FLOW DEPTH(FEET) =   3.75   TRAVEL TIME(MIN.) =   2.59
 Tc(MIN.) =   28.03
 SUBAREA AREA(ACRES) =   150.63       SUBAREA RUNOFF(CFS) =  220.02
 EFFECTIVE AREA(ACRES) =    873.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      874.0         PEAK FLOW RATE(CFS) =    1276.55
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.82

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.82   FLOW VELOCITY(FEET/SEC.) =  18.96
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10918.00 =   12614.02 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1279.22  DOWNSTREAM(FEET) =   1113.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.50   CHANNEL SLOPE =  0.0995
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.47
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.852
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       60.16      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1318.58
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.59
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  AVERAGE FLOW DEPTH(FEET) =   4.47   TRAVEL TIME(MIN.) =   1.78
  Tc(MIN.) =   29.81
  SUBAREA AREA(ACRES) =    60.16       SUBAREA RUNOFF(CFS) =   84.06
  EFFECTIVE AREA(ACRES) =    934.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      934.1         PEAK FLOW RATE(CFS) =    1305.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.44   FLOW VELOCITY(FEET/SEC.) =  15.55
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.81
  RAINFALL INTENSITY(INCH/HR) =   1.85
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     934.12
  TOTAL STREAM AREA(ACRES) =     934.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1305.20

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1068.88   26.64    1.978  0.30( 0.30) 1.00     707.7   10900.00
      2     1305.20   29.81    1.852  0.30( 0.30) 1.00     934.1   10910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2329.55   26.64    1.978  0.30( 0.30) 1.00    1542.4   10900.00
      2     2294.04   29.81    1.852  0.30( 0.30) 1.00    1641.8   10910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2329.55    Tc(MIN.) =    26.64
  EFFECTIVE AREA(ACRES) =    1542.38   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1641.8
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1113.60  DOWNSTREAM(FEET) =    961.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2282.16   CHANNEL SLOPE =  0.0668
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.67
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.883
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      185.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2461.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.87
  AVERAGE FLOW DEPTH(FEET) =   6.66   TRAVEL TIME(MIN.) =   2.40
  Tc(MIN.) =   29.04
  SUBAREA AREA(ACRES) =   185.67       SUBAREA RUNOFF(CFS) =  264.57
  EFFECTIVE AREA(ACRES) =   1728.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1827.5         PEAK FLOW RATE(CFS) =    2462.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.66   FLOW VELOCITY(FEET/SEC.) =  15.87
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10921.00 =   16560.68 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1827.5  TC(MIN.) =     29.04
  EFFECTIVE AREA(ACRES) =   1728.05  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    2462.34

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2462.34   29.04    1.883  0.30( 0.30) 1.00    1728.1   10900.00
      2     2433.20   32.22    1.779  0.30( 0.30) 1.00    1827.5   10910.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S10.DAT
  TIME/DATE OF STUDY: 10:06 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.148
   2)   10.00;  3.819
   3)   15.00;  2.862
   4)   20.00;  2.367
   5)   25.00;  2.022
   6)   30.00;  1.825
   7)   40.00;  1.534
   8)   50.00;  1.374
   9)   60.00;  1.300
  10)   90.00;  1.093
  11)  120.00;  0.963
  12)  180.00;  0.853
  13)  360.00;  0.653
  14) 1440.00;  0.293
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11000.00 TO NODE  11001.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   362.38
  ELEVATION DATA: UPSTREAM(FEET) =   2528.19  DOWNSTREAM(FEET) =   2375.55

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.863
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.349
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        2.03      0.30     1.000     0    8.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.40
  TOTAL AREA(ACRES) =      2.03   PEAK FLOW RATE(CFS) =      7.40

****************************************************************************
  FLOW PROCESS FROM NODE  11001.00 TO NODE  11002.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2375.55  DOWNSTREAM(FEET) =   2005.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.45   CHANNEL SLOPE =  0.6438
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.20
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.745
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        3.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.30
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   1.52
  Tc(MIN.) =   10.39
  SUBAREA AREA(ACRES) =     3.14       SUBAREA RUNOFF(CFS) =    9.74
  EFFECTIVE AREA(ACRES) =      5.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2         PEAK FLOW RATE(CFS) =      16.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   7.03
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11002.00 =     937.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11002.00 TO NODE  11003.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2005.09  DOWNSTREAM(FEET) =   1450.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.43   CHANNEL SLOPE =  0.5763
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.420
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.44
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   1.70
  Tc(MIN.) =   12.08
  SUBAREA AREA(ACRES) =    16.53       SUBAREA RUNOFF(CFS) =   46.42
  EFFECTIVE AREA(ACRES) =     21.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.7         PEAK FLOW RATE(CFS) =      60.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =  11.06
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11003.00 =    1900.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.44  DOWNSTREAM(FEET) =    939.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1351.71   CHANNEL SLOPE =  0.3779
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.044
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.99      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      99.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.47
  AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   1.96
  Tc(MIN.) =   14.05
  SUBAREA AREA(ACRES) =    30.99       SUBAREA RUNOFF(CFS) =   76.54
  EFFECTIVE AREA(ACRES) =     52.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       52.7         PEAK FLOW RATE(CFS) =     130.13
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =  12.54
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S8.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    11094.06   26.28  0.30( 0.30) 1.00    4820.9   10850.00
      2    11163.33   27.18  0.30( 0.30) 1.00    4987.8   10800.00
      3    11618.47   32.19  0.30( 0.30) 1.00    6142.3   10830.00
      4    11675.74   33.21  0.30( 0.30) 1.00    6352.1   10630.00
      5    12090.17   44.16  0.30( 0.30) 1.00    8750.5   10600.00
      6    12398.29   50.81  0.30( 0.30) 1.00   10225.8   10500.00
      7    12543.59   55.05  0.30( 0.30) 1.00   11109.2   10710.00
      8    12564.08   56.99  0.30( 0.30) 1.00   11441.3   10410.00
      9    12447.52   61.44  0.30( 0.30) 1.00   12102.3   10700.00
     10    12284.79   68.10  0.30( 0.30) 1.00   13021.4   10400.00
     11    12279.64   70.33  0.30( 0.30) 1.00   13291.2   10200.00
     12    12125.85   75.97  0.30( 0.30) 1.00   13870.5   10300.00
     13    12118.10   76.15  0.30( 0.30) 1.00   13883.2   10320.00
     14    11845.83   80.67  0.30( 0.30) 1.00   14075.1   10210.00
     15    10640.62  106.14  0.30( 0.30) 1.00   14771.7   10100.00
    TOTAL AREA(ACRES) =    14771.7

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S9.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2462.34   29.04  0.30( 0.30) 1.00    1728.1   10900.00
      2     2433.20   32.22  0.30( 0.30) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =     1827.5

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================
```

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2462.34	29.04	0.30(0.30)	1.00	1728.1	10900.00
2	2433.20	32.22	0.30(0.30)	1.00	1827.5	10910.00

TOTAL AREA(ACRES) = 1827.5

****

FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2462.34	29.04	1.863	0.30(0.30)	1.00	1728.1	10900.00
2	2433.20	32.22	1.760	0.30(0.30)	1.00	1827.5	10910.00

LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11094.06	26.28	1.971	0.30(0.30)	1.00	4820.9	10850.00
2	11163.33	27.18	1.936	0.30(0.30)	1.00	4987.8	10800.00
3	11618.47	32.19	1.761	0.30(0.30)	1.00	6142.3	10830.00
4	11675.74	33.21	1.731	0.30(0.30)	1.00	6352.1	10630.00
5	12090.17	44.16	1.467	0.30(0.30)	1.00	8750.5	10600.00
6	12398.29	50.81	1.368	0.30(0.30)	1.00	10225.8	10500.00
7	12543.59	55.05	1.337	0.30(0.30)	1.00	11109.2	10710.00
8	12564.08	56.99	1.322	0.30(0.30)	1.00	11441.3	10410.00
9	12447.52	61.44	1.290	0.30(0.30)	1.00	12102.3	10700.00
10	12284.79	68.10	1.244	0.30(0.30)	1.00	13021.4	10400.00
11	12279.64	70.33	1.229	0.30(0.30)	1.00	13291.2	10200.00
12	12125.85	75.97	1.190	0.30(0.30)	1.00	13870.5	10300.00
13	12118.10	76.15	1.189	0.30(0.30)	1.00	13883.2	10320.00
14	11845.83	80.67	1.157	0.30(0.30)	1.00	14075.1	10210.00
15	10640.62	106.14	1.023	0.30(0.30)	1.00	14771.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13477.61	26.28	1.971	0.30(0.30)	1.00	6385.1	10850.00
2	13576.15	27.18	1.936	0.30(0.30)	1.00	6605.5	10800.00
3	13794.24	29.04	1.863	0.30(0.30)	1.00	7143.4	10900.00
4	14051.95	32.19	1.761	0.30(0.30)	1.00	7968.8	10830.00
5	14053.36	32.22	1.760	0.30(0.30)	1.00	7976.0	10910.00
6	14060.69	33.21	1.731	0.30(0.30)	1.00	8179.6	10630.00
7	14035.31	44.16	1.467	0.30(0.30)	1.00	10578.0	10600.00
8	14177.66	50.81	1.368	0.30(0.30)	1.00	12053.3	10500.00
9	14270.76	55.05	1.337	0.30(0.30)	1.00	12936.7	10710.00
10	14267.35	56.99	1.322	0.30(0.30)	1.00	13268.8	10410.00
11	14097.08	61.44	1.290	0.30(0.30)	1.00	13929.8	10700.00
12	13857.82	68.10	1.244	0.30(0.30)	1.00	14848.9	10400.00
13	13826.98	70.33	1.229	0.30(0.30)	1.00	15118.7	10200.00
14	13608.40	75.97	1.190	0.30(0.30)	1.00	15698.0	10300.00

15	13598.53	76.15	1.189	0.30(0.30)	1.00	15710.7	10320.00
16	13274.32	80.67	1.157	0.30(0.30)	1.00	15902.6	10210.00
17	11845.35	106.14	1.023	0.30(0.30)	1.00	16599.2	10100.00

TOTAL AREA(ACRES) = 16599.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 14270.76 Tc(MIN.) = 55.049

EFFECTIVE AREA(ACRES) = 12936.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 16599.2

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

****

FLOW PROCESS FROM NODE 10921.00 TO NODE 11020.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 961.06 DOWNSTREAM(FEET) = 939.63

CHANNEL LENGTH THRU SUBAREA(FEET) = 601.65 CHANNEL SLOPE = 0.0356

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050

*ESTIMATED CHANNEL HEIGHT(FEET) = 11.04

* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.333

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.29	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14279.26

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 20.48

AVERAGE FLOW DEPTH(FEET) = 11.04 TRAVEL TIME(MIN.) = 0.49

Tc(MIN.) = 55.54

SUBAREA AREA(ACRES) = 18.29 SUBAREA RUNOFF(CFS) = 17.01

EFFECTIVE AREA(ACRES) = 12954.96 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 16617.5 PEAK FLOW RATE(CFS) = 14270.76

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050

*ESTIMATED CHANNEL HEIGHT(FEET) = 11.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.04 FLOW VELOCITY(FEET/SEC.) = 20.49

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

****

FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13477.61	26.78	1.952	0.30(0.30)	1.00	6403.4	10850.00
2	13576.15	27.68	1.917	0.30(0.30)	1.00	6623.7	10800.00

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      3    13794.24   29.53    1.844  0.30( 0.30) 1.00    7161.7   10900.00
      4    14051.95   32.68    1.747  0.30( 0.30) 1.00    7987.1   10830.00
      5    14053.36   32.71    1.746  0.30( 0.30) 1.00    7994.3   10910.00
      6    14060.69   33.71    1.717  0.30( 0.30) 1.00    8197.9   10630.00
      7    14035.31   44.65    1.460  0.30( 0.30) 1.00   10596.3   10600.00
      8    14177.66   51.30    1.364  0.30( 0.30) 1.00   12071.6   10500.00
      9    14270.76   55.54    1.333  0.30( 0.30) 1.00   12955.0   10710.00
     10    14267.35   57.48    1.319  0.30( 0.30) 1.00   13287.1   10410.00
     11    14097.08   61.93    1.287  0.30( 0.30) 1.00   13948.1   10700.00
     12    13857.82   68.59    1.241  0.30( 0.30) 1.00   14867.2   10400.00
     13    13826.98   70.83    1.225  0.30( 0.30) 1.00   15137.0   10200.00
     14    13608.40   76.47    1.186  0.30( 0.30) 1.00   15716.2   10300.00
     15    13598.53   76.65    1.185  0.30( 0.30) 1.00   15729.0   10320.00
     16    13274.32   81.17    1.154  0.30( 0.30) 1.00   15920.9   10210.00
     17    11845.35  106.66    1.021  0.30( 0.30) 1.00   16617.5   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      130.13   14.05    3.044  0.30( 0.30) 1.00      52.7   11000.00
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11874.63   14.05    3.044  0.30( 0.30) 1.00    3412.0   11000.00
      2    13555.94   26.78    1.952  0.30( 0.30) 1.00    6456.1   10850.00
      3    13652.81   27.68    1.917  0.30( 0.30) 1.00    6676.4   10800.00
      4    13867.44   29.53    1.844  0.30( 0.30) 1.00    7214.4   10900.00
      5    14120.57   32.68    1.747  0.30( 0.30) 1.00    8039.8   10830.00
      6    14121.94   32.71    1.746  0.30( 0.30) 1.00    8046.9   10910.00
      7    14127.90   33.71    1.717  0.30( 0.30) 1.00    8250.6   10630.00
      8    14090.30   44.65    1.460  0.30( 0.30) 1.00   10649.0   10600.00
      9    14228.13   51.30    1.364  0.30( 0.30) 1.00   12124.3   10500.00
     10    14319.75   55.54    1.333  0.30( 0.30) 1.00   13007.7   10710.00
     11    14315.66   57.48    1.319  0.30( 0.30) 1.00   13339.8   10410.00
     12    14143.87   61.93    1.287  0.30( 0.30) 1.00   14000.8   10700.00
     13    13902.44   68.59    1.241  0.30( 0.30) 1.00   14919.9   10400.00
     14    13870.86   70.83    1.225  0.30( 0.30) 1.00   15189.7   10200.00
     15    13650.44   76.47    1.186  0.30( 0.30) 1.00   15768.9   10300.00
     16    13640.51   76.65    1.185  0.30( 0.30) 1.00   15781.7   10320.00
     17    13314.82   81.17    1.154  0.30( 0.30) 1.00   15973.6   10210.00
     18    11879.54  106.66    1.021  0.30( 0.30) 1.00   16670.2   10100.00
    TOTAL AREA(ACRES) =     16670.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    14319.75  Tc(MIN.) =   55.538
  EFFECTIVE AREA(ACRES) =  13007.65  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    16670.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11020.00 TO NODE  11021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.63  DOWNSTREAM(FEET) =    865.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2876.19   CHANNEL SLOPE =  0.0259
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.98
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.314
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14406.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.25
  AVERAGE FLOW DEPTH(FEET) =  11.97   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =   58.16
  SUBAREA AREA(ACRES) =   191.02       SUBAREA RUNOFF(CFS) =  174.26
  EFFECTIVE AREA(ACRES) =  13198.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    16861.2         PEAK FLOW RATE(CFS) =   14319.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.94   FLOW VELOCITY(FEET/SEC.) =  18.23
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11021.00 =   61764.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11021.00 TO NODE  11022.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    865.22  DOWNSTREAM(FEET) =    752.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.47   CHANNEL SLOPE =  0.0389
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.88
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.297
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14463.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.24
  AVERAGE FLOW DEPTH(FEET) =  10.87   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   60.43
  SUBAREA AREA(ACRES) =   320.06       SUBAREA RUNOFF(CFS) =  287.21
  EFFECTIVE AREA(ACRES) =  13518.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17181.2         PEAK FLOW RATE(CFS) =   14319.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.82   FLOW VELOCITY(FEET/SEC.) =  21.18
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11022.00 =   64657.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11022.00 TO NODE  11023.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    752.60  DOWNSTREAM(FEET) =    737.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.15   CHANNEL SLOPE =  0.0081
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.73
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.279
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      226.98      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14420.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.89
  AVERAGE FLOW DEPTH(FEET) =  15.72   TRAVEL TIME(MIN.) =   2.61
  Tc(MIN.) =   63.05
  SUBAREA AREA(ACRES) =   226.98       SUBAREA RUNOFF(CFS) =  200.86
  EFFECTIVE AREA(ACRES) =  13745.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17408.2         PEAK FLOW RATE(CFS) =   14319.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 15.67   FLOW VELOCITY(FEET/SEC.) =  11.87
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11023.00 =   66521.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    737.50  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2632.50   CHANNEL SLOPE =  0.0222
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.40
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.261
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.84      0.30     0.992     -
```



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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14373.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.26
  AVERAGE FLOW DEPTH(FEET) =  12.39   TRAVEL TIME(MIN.) =   2.54
  Tc(MIN.) =   65.59
  SUBAREA AREA(ACRES) =   124.84       SUBAREA RUNOFF(CFS) =  108.30
  EFFECTIVE AREA(ACRES) =  13870.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17533.1         PEAK FLOW RATE(CFS) =   14319.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.37   FLOW VELOCITY(FEET/SEC.) =  17.25
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11363.00 =   69154.02 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    17533.1  TC(MIN.) =     65.59
  EFFECTIVE AREA(ACRES) =  13870.55  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =   14319.75

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1    11874.63   24.58    2.051  0.30( 0.30) 1.00    4274.9   11000.00
      2    13555.94   36.97    1.622  0.30( 0.30) 1.00    7319.0   10850.00
      3    13652.81   37.84    1.597  0.30( 0.30) 1.00    7539.3   10800.00
      4    13867.44   39.66    1.544  0.30( 0.30) 1.00    8077.3   10900.00
      5    14120.57   42.76    1.490  0.30( 0.30) 1.00    8902.7   10830.00
      6    14121.94   42.79    1.489  0.30( 0.30) 1.00    8909.8   10910.00
      7    14127.90   43.78    1.473  0.30( 0.30) 1.00    9113.5   10630.00
      8    14090.30   54.74    1.339  0.30( 0.30) 1.00   11511.9   10600.00
      9    14228.13   61.37    1.291  0.30( 0.30) 1.00   12987.2   10500.00
     10    14319.75   65.59    1.261  0.30( 0.30) 1.00   13870.6   10710.00
     11    14315.66   67.53    1.248  0.30( 0.30) 1.00   14202.7   10410.00
     12    14143.87   72.01    1.217  0.30( 0.30) 1.00   14863.7   10700.00
     13    13902.44   78.72    1.171  0.30( 0.30) 1.00   15782.8   10400.00
     14    13870.86   80.96    1.155  0.30( 0.30) 1.00   16052.6   10200.00
     15    13650.44   86.64    1.116  0.30( 0.30) 1.00   16631.8   10300.00
     16    13640.51   86.83    1.115  0.30( 0.30) 1.00   16644.6   10320.00
     17    13314.82   91.42    1.087  0.30( 0.30) 1.00   16836.5   10210.00
     18    11879.54  117.21    0.975  0.30( 0.30) 1.00   17533.1   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S11.DAT
  TIME/DATE OF STUDY: 10:06 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.148
   2)   10.00;  3.819
   3)   15.00;  2.862
   4)   20.00;  2.367
   5)   25.00;  2.022
   6)   30.00;  1.825
   7)   40.00;  1.534
   8)   50.00;  1.374
   9)   60.00;  1.300
  10)   90.00;  1.093
  11)  120.00;  0.963
  12)  180.00;  0.853
  13)  360.00;  0.653
  14) 1440.00;  0.293
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11101.00 TO NODE  11102.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   920.30
  ELEVATION DATA: UPSTREAM(FEET) =   4391.58  DOWNSTREAM(FEET) =   4080.28

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.444
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.160
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.68      0.30     1.000     0   13.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.90
  TOTAL AREA(ACRES) =      2.68   PEAK FLOW RATE(CFS) =      6.90

************************************************************************
  FLOW PROCESS FROM NODE  11102.00 TO NODE  11103.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4080.28  DOWNSTREAM(FEET) =   3876.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.85   CHANNEL SLOPE =  0.2123
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.807
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.57
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   2.11
  Tc(MIN.) =   15.56
  SUBAREA AREA(ACRES) =    39.96       SUBAREA RUNOFF(CFS) =   90.16
  EFFECTIVE AREA(ACRES) =     42.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       42.6          PEAK FLOW RATE(CFS) =      96.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   9.36
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11103.00 =    1880.15 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11103.00 TO NODE  11104.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3876.52  DOWNSTREAM(FEET) =   3625.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1902.80   CHANNEL SLOPE =  0.1317
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.44
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.479
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     170.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.57
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   18.87
  SUBAREA AREA(ACRES) =    75.64       SUBAREA RUNOFF(CFS) =  148.34
  EFFECTIVE AREA(ACRES) =    118.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.3         PEAK FLOW RATE(CFS) =     231.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.66   FLOW VELOCITY(FEET/SEC.) =  10.50
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11104.00 =    3782.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11104.00 TO NODE  11105.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3625.86  DOWNSTREAM(FEET) =   3222.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2898.91   CHANNEL SLOPE =  0.1391
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.19
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.175
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      167.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     373.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.36
  AVERAGE FLOW DEPTH(FEET) =   2.12   TRAVEL TIME(MIN.) =   3.91
  Tc(MIN.) =   22.78
  SUBAREA AREA(ACRES) =   167.73       SUBAREA RUNOFF(CFS) =  283.09
  EFFECTIVE AREA(ACRES) =    286.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.0         PEAK FLOW RATE(CFS) =     482.72
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.44   FLOW VELOCITY(FEET/SEC.) =  13.32
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11105.00 =    6681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3222.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2480.35   CHANNEL SLOPE =  0.1089
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.15
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.988
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      252.33      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     674.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.43
  AVERAGE FLOW DEPTH(FEET) =   3.10   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   25.86
  SUBAREA AREA(ACRES) =   252.33       SUBAREA RUNOFF(CFS) =  383.40
  EFFECTIVE AREA(ACRES) =    538.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      538.3         PEAK FLOW RATE(CFS) =     817.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.43   FLOW VELOCITY(FEET/SEC.) =  14.15
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11121.00 =    9162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.86
  RAINFALL INTENSITY(INCH/HR) =   1.99
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     538.34
  TOTAL STREAM AREA(ACRES) =     538.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     817.98
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11111.00 TO NODE  11112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   329.73
  ELEVATION DATA: UPSTREAM(FEET) =   4094.14  DOWNSTREAM(FEET) =   3956.68

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.552
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.494
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.49      0.30     1.000     0    8.55
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.62
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      5.62

****************************************************************************
  FLOW PROCESS FROM NODE  11112.00 TO NODE  11113.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3956.68  DOWNSTREAM(FEET) =   3752.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.35   CHANNEL SLOPE =  0.3066
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.747
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        9.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.07
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.83
  Tc(MIN.) =   10.38
  SUBAREA AREA(ACRES) =     9.55       SUBAREA RUNOFF(CFS) =   29.62
  EFFECTIVE AREA(ACRES) =     11.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       11.0         PEAK FLOW RATE(CFS) =      34.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   7.33
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11113.00 =     995.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11113.00 TO NODE  11114.00 IS CODE =  56
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3752.68  DOWNSTREAM(FEET) =   3541.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   955.83   CHANNEL SLOPE =  0.2209
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.75
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.390
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       26.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.54
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   1.86
  Tc(MIN.) =   12.24
  SUBAREA AREA(ACRES) =    26.09       SUBAREA RUNOFF(CFS) =   72.55
  EFFECTIVE AREA(ACRES) =     37.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.1         PEAK FLOW RATE(CFS) =     103.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   9.68
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11114.00 =    1950.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11114.00 TO NODE  11115.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3541.57  DOWNSTREAM(FEET) =   3320.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.90   CHANNEL SLOPE =  0.1172
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.46
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.789
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       51.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     160.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.02
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   3.49
  Tc(MIN.) =   15.73
  SUBAREA AREA(ACRES) =    51.13       SUBAREA RUNOFF(CFS) =  114.55
  EFFECTIVE AREA(ACRES) =     88.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       88.3         PEAK FLOW RATE(CFS) =     197.74
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.57   FLOW VELOCITY(FEET/SEC.) =   9.61
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11115.00 =    3840.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11115.00 TO NODE  11116.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3320.00  DOWNSTREAM(FEET) =   3162.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.45   CHANNEL SLOPE =  0.0837
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.57
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.492
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     389.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.46
  AVERAGE FLOW DEPTH(FEET) =   2.48   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =   18.73
  SUBAREA AREA(ACRES) =   193.52       SUBAREA RUNOFF(CFS) =  381.83
  EFFECTIVE AREA(ACRES) =    281.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.8         PEAK FLOW RATE(CFS) =     555.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.00   FLOW VELOCITY(FEET/SEC.) =  11.57
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11116.00 =    5724.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11116.00 TO NODE  11117.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3162.36  DOWNSTREAM(FEET) =   3062.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.90   CHANNEL SLOPE =  0.0524
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.73
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.240
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.47      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     654.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.21
  AVERAGE FLOW DEPTH(FEET) =   3.69   TRAVEL TIME(MIN.) =   3.11
  Tc(MIN.) =   21.84
  SUBAREA AREA(ACRES) =   112.47       SUBAREA RUNOFF(CFS) =  196.36
  EFFECTIVE AREA(ACRES) =    394.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      394.2         PEAK FLOW RATE(CFS) =     688.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.78   FLOW VELOCITY(FEET/SEC.) =  10.36
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11117.00 =    7628.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1878.40   CHANNEL SLOPE =  0.0587
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.80
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.043
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     728.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.95
  AVERAGE FLOW DEPTH(FEET) =   3.79   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =   24.70
  SUBAREA AREA(ACRES) =    51.63       SUBAREA RUNOFF(CFS) =   80.98
  EFFECTIVE AREA(ACRES) =    445.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      445.9         PEAK FLOW RATE(CFS) =     699.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.71   FLOW VELOCITY(FEET/SEC.) =  10.84
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   24.70
 RAINFALL INTENSITY(INCH/HR) =   2.04
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     445.88
 TOTAL STREAM AREA(ACRES) =     445.88
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     699.31

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      817.98   25.86    1.988  0.30( 0.30) 1.00     538.3   11101.00
     2      699.31   24.70    2.043  0.30( 0.30) 1.00     445.9   11111.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1505.89   24.70    2.043  0.30( 0.30) 1.00     960.2   11111.00
     2     1495.47   25.86    1.988  0.30( 0.30) 1.00     984.2   11101.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1505.89    Tc(MIN.) =    24.70
 EFFECTIVE AREA(ACRES) =     960.15   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =      984.2
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11121.00 TO NODE  11122.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2952.48  DOWNSTREAM(FEET) =   2639.37
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2687.92   CHANNEL SLOPE =  0.1165
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.79
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.933
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -      170.98      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1631.54
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.49
 AVERAGE FLOW DEPTH(FEET) =   4.77   TRAVEL TIME(MIN.) =   2.56
 Tc(MIN.) =   27.26
 SUBAREA AREA(ACRES) =   170.98       SUBAREA RUNOFF(CFS) =  251.27
 EFFECTIVE AREA(ACRES) =   1131.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1155.2         PEAK FLOW RATE(CFS) =    1662.31
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.82

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.82   FLOW VELOCITY(FEET/SEC.) =  17.58
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11122.00 =   12194.48 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2639.37  DOWNSTREAM(FEET) =   1954.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3696.53   CHANNEL SLOPE =  0.1854
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.40
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.820
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED              -      114.61      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1740.70
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.10
 AVERAGE FLOW DEPTH(FEET) =   4.39   TRAVEL TIME(MIN.) =   2.92
 Tc(MIN.) =   30.18
 SUBAREA AREA(ACRES) =   114.61       SUBAREA RUNOFF(CFS) =  156.76
 EFFECTIVE AREA(ACRES) =   1245.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1269.8         PEAK FLOW RATE(CFS) =    1703.89
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.35

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.35   FLOW VELOCITY(FEET/SEC.) =  20.98
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   30.18
 RAINFALL INTENSITY(INCH/HR) =   1.82
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    1245.74
 TOTAL STREAM AREA(ACRES) =    1269.81
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    1703.89
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11130.00 TO NODE  11131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   259.85
  ELEVATION DATA: UPSTREAM(FEET) =   3923.93  DOWNSTREAM(FEET) =   3765.35

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.204
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  5.121
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.27      0.30     1.000     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.51
  TOTAL AREA(ACRES) =      1.27   PEAK FLOW RATE(CFS) =      5.51

****************************************************************************
  FLOW PROCESS FROM NODE  11131.00 TO NODE  11132.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3765.35  DOWNSTREAM(FEET) =   3414.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   674.05   CHANNEL SLOPE =  0.5200
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.345
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.75
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   1.67
  Tc(MIN.) =    8.87
  SUBAREA AREA(ACRES) =     6.52       SUBAREA RUNOFF(CFS) =   23.74
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      28.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   8.04
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11132.00 =     933.90 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  11132.00 TO NODE  11133.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3414.86  DOWNSTREAM(FEET) =   2699.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1813.44   CHANNEL SLOPE =  0.3945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.77
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.518
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      89.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.19
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   11.57
  SUBAREA AREA(ACRES) =    41.63       SUBAREA RUNOFF(CFS) =  120.58
  EFFECTIVE AREA(ACRES) =     49.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       49.4         PEAK FLOW RATE(CFS) =     143.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.92   FLOW VELOCITY(FEET/SEC.) =  13.14
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11133.00 =    2747.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11133.00 TO NODE  11134.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2699.51  DOWNSTREAM(FEET) =   2464.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1053.33   CHANNEL SLOPE =  0.2235
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.281
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      142.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     334.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.16
  AVERAGE FLOW DEPTH(FEET) =   1.75   TRAVEL TIME(MIN.) =   1.24
  Tc(MIN.) =   12.81
  SUBAREA AREA(ACRES) =   142.85       SUBAREA RUNOFF(CFS) =  383.24
  EFFECTIVE AREA(ACRES) =    192.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =      192.3         PEAK FLOW RATE(CFS) =     515.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.22   FLOW VELOCITY(FEET/SEC.) =  16.06
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11134.00 =    3800.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.06  DOWNSTREAM(FEET) =   1954.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1291.98   CHANNEL SLOPE =  0.3946
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.97
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.075
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.58      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     546.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.98
  AVERAGE FLOW DEPTH(FEET) =   1.96   TRAVEL TIME(MIN.) =   1.08
  Tc(MIN.) =   13.89
  SUBAREA AREA(ACRES) =    24.58       SUBAREA RUNOFF(CFS) =   61.38
  EFFECTIVE AREA(ACRES) =    216.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      216.9         PEAK FLOW RATE(CFS) =     541.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =  19.90
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11141.00 =    5092.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.89
  RAINFALL INTENSITY(INCH/HR) =   3.07
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     216.85
  TOTAL STREAM AREA(ACRES) =     216.85
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     541.52

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1703.89   30.18    1.820  0.30( 0.30) 1.00    1245.7   11111.00
      1     1698.02   31.35    1.786  0.30( 0.30) 1.00    1269.8   11101.00
      2      541.52   13.89    3.075  0.30( 0.30) 1.00     216.9   11130.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1973.04   13.89    3.075  0.30( 0.30) 1.00     790.1   11130.00
      2     2000.49   30.18    1.820  0.30( 0.30) 1.00    1462.6   11111.00
      3     1988.00   31.35    1.786  0.30( 0.30) 1.00    1486.7   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2000.49    Tc(MIN.) =    30.18
  EFFECTIVE AREA(ACRES) =    1462.59   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1486.7
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1486.7  TC(MIN.) =     30.18
  EFFECTIVE AREA(ACRES) =   1462.59  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    2000.49

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1973.04   13.89    3.075  0.30( 0.30) 1.00     790.1   11130.00
      2     2000.49   30.18    1.820  0.30( 0.30) 1.00    1462.6   11111.00
      3     1988.00   31.35    1.786  0.30( 0.30) 1.00    1486.7   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S12.DAT
  TIME/DATE OF STUDY: 10:07 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.148
   2)   10.00;  3.819
   3)   15.00;  2.862
   4)   20.00;  2.367
   5)   25.00;  2.022
   6)   30.00;  1.825
   7)   40.00;  1.534
   8)   50.00;  1.374
   9)   60.00;  1.300
  10)   90.00;  1.093
  11)  120.00;  0.963
  12)  180.00;  0.853
  13)  360.00;  0.653
  14) 1440.00;  0.293
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11220.00 TO NODE  11221.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   762.39
  ELEVATION DATA: UPSTREAM(FEET) =   3797.72  DOWNSTREAM(FEET) =   3296.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.919
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.643
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        5.02      0.30     1.000     0   10.92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     15.10
  TOTAL AREA(ACRES) =      5.02   PEAK FLOW RATE(CFS) =     15.10

****************************************************************************
  FLOW PROCESS FROM NODE  11221.00 TO NODE  11223.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3296.86  DOWNSTREAM(FEET) =   2738.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   912.82   CHANNEL SLOPE =  0.6112
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.369
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.61
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   1.43
  Tc(MIN.) =   12.35
  SUBAREA AREA(ACRES) =    26.44       SUBAREA RUNOFF(CFS) =   73.02
  EFFECTIVE AREA(ACRES) =     31.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.5          PEAK FLOW RATE(CFS) =      86.89
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =  12.75
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11223.00 =    1675.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11223.00 TO NODE  11224.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2738.96  DOWNSTREAM(FEET) =   2370.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.79   CHANNEL SLOPE =  0.3843
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.155
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     192.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.32
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   1.12
  Tc(MIN.) =   13.47
  SUBAREA AREA(ACRES) =    82.44       SUBAREA RUNOFF(CFS) =  211.83
  EFFECTIVE AREA(ACRES) =    113.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.9         PEAK FLOW RATE(CFS) =     292.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.40   FLOW VELOCITY(FEET/SEC.) =  16.35
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11224.00 =    2635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2370.12  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.40   CHANNEL SLOPE =  0.2591
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.773
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     361.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.22
  AVERAGE FLOW DEPTH(FEET) =   1.76   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   15.90
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =  137.82
  EFFECTIVE AREA(ACRES) =    175.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      175.8         PEAK FLOW RATE(CFS) =     391.28
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =  15.61
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S11.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1973.04   13.89  0.30( 0.30) 1.00     790.1   11130.00
      2     2000.49   30.18  0.30( 0.30) 1.00    1462.6   11111.00
      3     1988.00   31.35  0.30( 0.30) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =     1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1973.04   13.89  0.30( 0.30) 1.00     790.1   11130.00
      2     2000.49   30.18  0.30( 0.30) 1.00    1462.6   11111.00
      3     1988.00   31.35  0.30( 0.30) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =      1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11231.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1954.20  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1435.64   CHANNEL SLOPE =  0.1116
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.41
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.782
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       89.78      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2060.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.31
  AVERAGE FLOW DEPTH(FEET) =   5.41   TRAVEL TIME(MIN.) =   1.31
  Tc(MIN.) =   31.49
  SUBAREA AREA(ACRES) =    89.78       SUBAREA RUNOFF(CFS) =  119.73
  EFFECTIVE AREA(ACRES) =   1552.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1576.4          PEAK FLOW RATE(CFS) =    2070.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.42   FLOW VELOCITY(FEET/SEC.) =  18.33
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2013.68   15.19    2.843  0.30( 0.30) 1.00     879.9   11130.00
      2     2070.16   31.49    1.782  0.30( 0.30) 1.00    1552.4   11111.00
      3     2054.00   32.66    1.748  0.30( 0.30) 1.00    1576.4   11101.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      391.28   15.90    2.773  0.30( 0.30) 1.00     175.8   11220.00
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2398.12   15.19    2.843  0.30( 0.30) 1.00    1047.9   11130.00
      2     2407.42   15.90    2.773  0.30( 0.30) 1.00    1085.0   11220.00
      3     2304.64   31.49    1.782  0.30( 0.30) 1.00    1728.2   11111.00
      4     2283.10   32.66    1.748  0.30( 0.30) 1.00    1752.3   11101.00
    TOTAL AREA(ACRES) =      1752.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2407.42  Tc(MIN.) =   15.904
  EFFECTIVE AREA(ACRES) =   1085.00  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1752.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.01  DOWNSTREAM(FEET) =   1680.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.84   CHANNEL SLOPE =  0.0585
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.88
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.561
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       59.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2468.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.11
  AVERAGE FLOW DEPTH(FEET) =   6.88   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =   18.04
  SUBAREA AREA(ACRES) =    59.78       SUBAREA RUNOFF(CFS) =  121.67
  EFFECTIVE AREA(ACRES) =   1144.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1812.1          PEAK FLOW RATE(CFS) =    2407.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.79   FLOW VELOCITY(FEET/SEC.) =  15.02
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.04
  RAINFALL INTENSITY(INCH/HR) =   2.56
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1144.78
  TOTAL STREAM AREA(ACRES) =    1812.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2407.42

****************************************************************************
  FLOW PROCESS FROM NODE  11201.00 TO NODE  11202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   986.34
  ELEVATION DATA: UPSTREAM(FEET) =   3383.22  DOWNSTREAM(FEET) =   3248.87

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.343
```

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  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.562
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                -       8.54      0.30     1.000     0   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     25.07
  TOTAL AREA(ACRES) =      8.54   PEAK FLOW RATE(CFS) =     25.07

****************************************************************************
  FLOW PROCESS FROM NODE  11202.00 TO NODE  11203.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3248.87  DOWNSTREAM(FEET) =   3198.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   922.69   CHANNEL SLOPE =  0.0550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.965
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.93
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   3.12
  Tc(MIN.) =   14.46
  SUBAREA AREA(ACRES) =    24.42       SUBAREA RUNOFF(CFS) =   58.56
  EFFECTIVE AREA(ACRES) =     32.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      79.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =   5.56
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11203.00 =    1909.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11203.00 TO NODE  11204.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3198.08  DOWNSTREAM(FEET) =   3062.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1941.08   CHANNEL SLOPE =  0.0699
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.39
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.445
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       37.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     115.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.82
  AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   4.75
  Tc(MIN.) =   19.21
  SUBAREA AREA(ACRES) =    37.67       SUBAREA RUNOFF(CFS) =   72.73
  EFFECTIVE AREA(ACRES) =     70.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =     136.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.47   FLOW VELOCITY(FEET/SEC.) =   7.17
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11204.00 =    3850.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11204.00 TO NODE  11205.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.48  DOWNSTREAM(FEET) =   2940.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.73   CHANNEL SLOPE =  0.0636
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.123
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     165.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.38
  AVERAGE FLOW DEPTH(FEET) =   1.68   TRAVEL TIME(MIN.) =   4.33
  Tc(MIN.) =   23.54
  SUBAREA AREA(ACRES) =    34.87       SUBAREA RUNOFF(CFS) =   57.20
  EFFECTIVE AREA(ACRES) =    105.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      105.5         PEAK FLOW RATE(CFS) =     173.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.72   FLOW VELOCITY(FEET/SEC.) =   7.48
  LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11205.00 =    5766.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11205.00 TO NODE  11206.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2940.56  DOWNSTREAM(FEET) =   2581.93
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2865.58   CHANNEL SLOPE =  0.1252
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.892
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       56.17      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     213.35
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.06
 AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   4.75
 Tc(MIN.) =   28.29
 SUBAREA AREA(ACRES) =    56.17       SUBAREA RUNOFF(CFS) =   80.51
 EFFECTIVE AREA(ACRES) =    161.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      161.7         PEAK FLOW RATE(CFS) =     231.71
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.68   FLOW VELOCITY(FEET/SEC.) =  10.31
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11206.00 =    8632.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11206.00 TO NODE  11207.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2581.93  DOWNSTREAM(FEET) =   2317.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1985.44   CHANNEL SLOPE =  0.1333
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.82
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.806
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      546.87      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     602.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.98
 AVERAGE FLOW DEPTH(FEET) =   2.77   TRAVEL TIME(MIN.) =   2.37
 Tc(MIN.) =   30.66
 SUBAREA AREA(ACRES) =   546.87       SUBAREA RUNOFF(CFS) =  741.22
 EFFECTIVE AREA(ACRES) =    708.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      708.5         PEAK FLOW RATE(CFS) =     960.35
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
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 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.54

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.54   FLOW VELOCITY(FEET/SEC.) =  15.91
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11207.00 =   10617.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2317.20  DOWNSTREAM(FEET) =   1680.94
 CHANNEL LENGTH THRU SUBAREA(FEET) =  4085.95   CHANNEL SLOPE =  0.1557
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.84
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.695
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      389.75      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1205.20
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.94
 AVERAGE FLOW DEPTH(FEET) =   3.81   TRAVEL TIME(MIN.) =   3.80
 Tc(MIN.) =   34.45
 SUBAREA AREA(ACRES) =   389.75       SUBAREA RUNOFF(CFS) =  489.52
 EFFECTIVE AREA(ACRES) =   1098.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1098.3         PEAK FLOW RATE(CFS) =    1379.43
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.08

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.08   FLOW VELOCITY(FEET/SEC.) =  18.59
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11241.00 =   14703.81 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   34.45
 RAINFALL INTENSITY(INCH/HR) =   1.70
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    1098.29
 TOTAL STREAM AREA(ACRES) =    1098.29
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    1379.43

 ** CONFLUENCE DATA **
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 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1     2398.12   17.33    2.631  0.30( 0.30) 1.00    1107.6   11130.00
    1     2407.42   18.04    2.561  0.30( 0.30) 1.00    1144.8   11220.00
    1     2304.64   33.65    1.719  0.30( 0.30) 1.00    1788.0   11111.00
    1     2283.10   34.83    1.685  0.30( 0.30) 1.00    1812.1   11101.00
    2     1379.43   34.45    1.695  0.30( 0.30) 1.00    1098.3   11201.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1     3557.34   17.33    2.631  0.30( 0.30) 1.00    1660.1   11130.00
    2     3577.71   18.04    2.561  0.30( 0.30) 1.00    1719.8   11220.00
    3     3674.51   33.65    1.719  0.30( 0.30) 1.00    2860.8   11111.00
    4     3669.39   34.45    1.695  0.30( 0.30) 1.00    2902.7   11201.00
    5     3651.77   34.83    1.685  0.30( 0.30) 1.00    2910.3   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    3674.51    Tc(MIN.) =    33.65
  EFFECTIVE AREA(ACRES) =    2860.77   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2910.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11241.00 TO NODE  11242.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1680.94  DOWNSTREAM(FEET) =   1521.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1795.61   CHANNEL SLOPE =  0.0890
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.63
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.675
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      198.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3797.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.73
  AVERAGE FLOW DEPTH(FEET) =   7.62   TRAVEL TIME(MIN.) =   1.52
  Tc(MIN.) =   35.17
  SUBAREA AREA(ACRES) =   198.62       SUBAREA RUNOFF(CFS) =  245.73
  EFFECTIVE AREA(ACRES) =   3059.39     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3109.0         PEAK FLOW RATE(CFS) =    3785.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) =  7.61   FLOW VELOCITY(FEET/SEC.) =  19.72
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11242.00 =   21056.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1521.21  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.33   CHANNEL SLOPE =  0.0797
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.86
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.618
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       95.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3841.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.00
  AVERAGE FLOW DEPTH(FEET) =   7.86   TRAVEL TIME(MIN.) =   1.95
  Tc(MIN.) =   37.12
  SUBAREA AREA(ACRES) =    95.39       SUBAREA RUNOFF(CFS) =  113.14
  EFFECTIVE AREA(ACRES) =   3154.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3204.3         PEAK FLOW RATE(CFS) =    3785.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.81   FLOW VELOCITY(FEET/SEC.) =  18.93
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   37.12
  RAINFALL INTENSITY(INCH/HR) =   1.62
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3154.78
  TOTAL STREAM AREA(ACRES) =    3204.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    3785.07

****************************************************************************
  FLOW PROCESS FROM NODE  11250.00 TO NODE  11251.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   982.50
  ELEVATION DATA: UPSTREAM(FEET) =   3806.44  DOWNSTREAM(FEET) =   3168.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.112
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.415
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.91      0.30     1.000     0   12.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     16.57
  TOTAL AREA(ACRES) =      5.91   PEAK FLOW RATE(CFS) =     16.57

********************************************************************************
  FLOW PROCESS FROM NODE  11251.00 TO NODE  11252.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3168.25  DOWNSTREAM(FEET) =   2683.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.5240
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.074
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.66
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   1.78
  Tc(MIN.) =   13.89
  SUBAREA AREA(ACRES) =    13.73       SUBAREA RUNOFF(CFS) =   34.28
  EFFECTIVE AREA(ACRES) =     19.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       19.6         PEAK FLOW RATE(CFS) =      49.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   9.92
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11252.00 =    1908.12 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  11252.00 TO NODE  11253.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   2683.24  DOWNSTREAM(FEET) =   2334.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.66   CHANNEL SLOPE =  0.3694
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.840
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       55.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     112.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.82
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   1.33
  Tc(MIN.) =   15.23
  SUBAREA AREA(ACRES) =    55.67       SUBAREA RUNOFF(CFS) =  127.25
  EFFECTIVE AREA(ACRES) =     75.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       75.3         PEAK FLOW RATE(CFS) =     172.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =  13.67
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11253.00 =    2852.78 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  11253.00 TO NODE  11254.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2334.26  DOWNSTREAM(FEET) =   1768.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2293.59   CHANNEL SLOPE =  0.2468
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.583
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     342.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.73
  AVERAGE FLOW DEPTH(FEET) =   1.73   TRAVEL TIME(MIN.) =   2.59
  Tc(MIN.) =   17.82
  SUBAREA AREA(ACRES) =   165.43       SUBAREA RUNOFF(CFS) =  339.90
  EFFECTIVE AREA(ACRES) =    240.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      240.7         PEAK FLOW RATE(CFS) =     494.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.12
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```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.12   FLOW VELOCITY(FEET/SEC.) =  16.42
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11254.00 =    5146.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11254.00 TO NODE  11255.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1768.11  DOWNSTREAM(FEET) =   1506.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.59   CHANNEL SLOPE =  0.1376
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.96
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.369
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     675.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.62
  AVERAGE FLOW DEPTH(FEET) =   2.92   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   19.98
  SUBAREA AREA(ACRES) =   194.55       SUBAREA RUNOFF(CFS) =  362.22
  EFFECTIVE AREA(ACRES) =    435.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      435.3         PEAK FLOW RATE(CFS) =     810.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.21   FLOW VELOCITY(FEET/SEC.) =  15.38
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11255.00 =    7043.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.97  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =   882.10   CHANNEL SLOPE =  0.1848
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.311
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      137.86      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     935.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.81
```



```
  AVERAGE FLOW DEPTH(FEET) =   3.20   TRAVEL TIME(MIN.) =   0.83
  Tc(MIN.) =   20.81
  SUBAREA AREA(ACRES) =   137.86       SUBAREA RUNOFF(CFS) =  249.55
  EFFECTIVE AREA(ACRES) =    573.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      573.1         PEAK FLOW RATE(CFS) =    1037.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.38   FLOW VELOCITY(FEET/SEC.) =  18.29
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11261.00 =    7926.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.81
  RAINFALL INTENSITY(INCH/HR) =   2.31
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     573.15
  TOTAL STREAM AREA(ACRES) =     573.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1037.48

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3648.19   20.81    2.311  0.30( 0.30) 1.00    1954.1   11130.00
      1     3644.71   21.52    2.262  0.30( 0.30) 1.00    2013.8   11220.00
      1     3785.07   37.12    1.618  0.30( 0.30) 1.00    3154.8   11111.00
      1     3771.90   37.92    1.594  0.30( 0.30) 1.00    3196.7   11201.00
      1     3750.56   38.30    1.583  0.30( 0.30) 1.00    3204.3   11101.00
      2     1037.48   20.81    2.311  0.30( 0.30) 1.00     573.1   11250.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4685.39   20.81    2.311  0.30( 0.30) 1.00    2526.7   11250.00
      2     4685.47   20.81    2.311  0.30( 0.30) 1.00    2527.3   11130.00
      3     4656.80   21.52    2.262  0.30( 0.30) 1.00    2586.9   11220.00
      4     4464.90   37.12    1.618  0.30( 0.30) 1.00    3727.9   11111.00
      5     4439.67   37.92    1.594  0.30( 0.30) 1.00    3769.8   11201.00
      6     4412.66   38.30    1.583  0.30( 0.30) 1.00    3777.5   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    4685.47    Tc(MIN.) =    20.81
  EFFECTIVE AREA(ACRES) =    2527.25   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
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  TOTAL AREA(ACRES) =     3777.5
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1343.95  DOWNSTREAM(FEET) =   1299.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =   889.38   CHANNEL SLOPE =  0.0503
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.62
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.250
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.65      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4755.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.91
  AVERAGE FLOW DEPTH(FEET) =   9.62   TRAVEL TIME(MIN.) =   0.88
  Tc(MIN.) =   21.69
  SUBAREA AREA(ACRES) =    79.65       SUBAREA RUNOFF(CFS) =  139.81
  EFFECTIVE AREA(ACRES) =   2606.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3857.1         PEAK FLOW RATE(CFS) =    4685.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.56   FLOW VELOCITY(FEET/SEC.) =  16.84
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11310.00 =   24168.81 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3857.1  TC(MIN.) =     21.69
  EFFECTIVE AREA(ACRES) =   2606.90  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    4685.47

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     4685.39   21.69    2.251  0.30( 0.30) 1.00    2606.4   11250.00
      2     4685.47   21.69    2.250  0.30( 0.30) 1.00    2606.9   11130.00
      3     4656.80   22.40    2.201  0.30( 0.30) 1.00    2666.6   11220.00
      4     4464.90   38.01    1.592  0.30( 0.30) 1.00    3807.6   11111.00
      5     4439.67   38.81    1.569  0.30( 0.30) 1.00    3849.5   11201.00
      6     4412.66   39.19    1.558  0.30( 0.30) 1.00    3857.1   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S13.DAT
  TIME/DATE OF STUDY: 10:07 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.148
   2)   10.00;  3.819
   3)   15.00;  2.862
   4)   20.00;  2.367
   5)   25.00;  2.022
   6)   30.00;  1.825
   7)   40.00;  1.534
   8)   50.00;  1.374
   9)   60.00;  1.300
  10)   90.00;  1.093
  11)  120.00;  0.963
  12)  180.00;  0.853
  13)  360.00;  0.653
  14) 1440.00;  0.293
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11300.00 TO NODE  11301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   455.90
  ELEVATION DATA: UPSTREAM(FEET) =   3394.67  DOWNSTREAM(FEET) =   3247.06

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.240
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.773
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.53      0.30     1.000      0   10.24
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.91
  TOTAL AREA(ACRES) =      2.53   PEAK FLOW RATE(CFS) =      7.91

****************************************************************************
  FLOW PROCESS FROM NODE  11301.00 TO NODE  11301.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3247.06  DOWNSTREAM(FEET) =   3150.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   468.69   CHANNEL SLOPE =  0.2059
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.507
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.95      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.62
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   1.39
  Tc(MIN.) =   11.63
  SUBAREA AREA(ACRES) =    10.95       SUBAREA RUNOFF(CFS) =   31.60
  EFFECTIVE AREA(ACRES) =     13.48     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.5          PEAK FLOW RATE(CFS) =      38.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   6.75
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11301.50 =     924.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11301.50 TO NODE  11302.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3150.57  DOWNSTREAM(FEET) =   2840.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =   982.20   CHANNEL SLOPE =  0.3162
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.141
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.57
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   1.91
  Tc(MIN.) =   13.54
  SUBAREA AREA(ACRES) =     9.59       SUBAREA RUNOFF(CFS) =   24.53
  EFFECTIVE AREA(ACRES) =     23.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.1         PEAK FLOW RATE(CFS) =      59.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   9.04
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11302.00 =    1906.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11302.00 TO NODE  11303.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2840.04  DOWNSTREAM(FEET) =   2177.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.03   CHANNEL SLOPE =  0.3460
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.05
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.759
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     152.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.79
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =   2.50
  Tc(MIN.) =   16.04
  SUBAREA AREA(ACRES) =    84.31       SUBAREA RUNOFF(CFS) =  186.62
  EFFECTIVE AREA(ACRES) =    107.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.4         PEAK FLOW RATE(CFS) =     237.69
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.28   FLOW VELOCITY(FEET/SEC.) =  14.80
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11303.00 =    3822.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11303.00 TO NODE  11304.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2177.16  DOWNSTREAM(FEET) =   1612.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2472.34   CHANNEL SLOPE =  0.2285
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.473
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       99.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     335.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.25
  AVERAGE FLOW DEPTH(FEET) =   1.74   TRAVEL TIME(MIN.) =   2.89
  Tc(MIN.) =   18.93
  SUBAREA AREA(ACRES) =    99.61       SUBAREA RUNOFF(CFS) =  194.83
  EFFECTIVE AREA(ACRES) =    206.99     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.0         PEAK FLOW RATE(CFS) =     404.85
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.94   FLOW VELOCITY(FEET/SEC.) =  15.08
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11304.00 =    6295.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1612.27  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2432.96   CHANNEL SLOPE =  0.1604
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.28
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.238
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.86      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     451.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.76
  AVERAGE FLOW DEPTH(FEET) =   2.26   TRAVEL TIME(MIN.) =   2.95
  Tc(MIN.) =   21.87
  SUBAREA AREA(ACRES) =    53.86       SUBAREA RUNOFF(CFS) =   93.93
  EFFECTIVE AREA(ACRES) =    260.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      260.8          PEAK FLOW RATE(CFS) =     454.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.27   FLOW VELOCITY(FEET/SEC.) =  13.78
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S12.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     4685.39   21.69  0.30( 0.30) 1.00    2606.4   11250.00
      2     4685.47   21.69  0.30( 0.30) 1.00    2606.9   11130.00
      3     4656.80   22.40  0.30( 0.30) 1.00    2666.6   11220.00
      4     4464.90   38.01  0.30( 0.30) 1.00    3807.6   11111.00
      5     4439.67   38.81  0.30( 0.30) 1.00    3849.5   11201.00
      6     4412.66   39.19  0.30( 0.30) 1.00    3857.1   11101.00
    TOTAL AREA(ACRES) =     3857.1

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     4685.39   21.69  0.30( 0.30) 1.00    2606.4   11250.00
      2     4685.47   21.69  0.30( 0.30) 1.00    2606.9   11130.00
      3     4656.80   22.40  0.30( 0.30) 1.00    2666.6   11220.00
      4     4464.90   38.01  0.30( 0.30) 1.00    3807.6   11111.00
      5     4439.67   38.81  0.30( 0.30) 1.00    3849.5   11201.00
      6     4412.66   39.19  0.30( 0.30) 1.00    3857.1   11101.00
    TOTAL AREA(ACRES) =     3857.1
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11310.00 TO NODE  11320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1299.17  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1694.05   CHANNEL SLOPE =  0.0455
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.85
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.131
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4754.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.28
  AVERAGE FLOW DEPTH(FEET) =   9.84   TRAVEL TIME(MIN.) =   1.73
  Tc(MIN.) =   23.43
  SUBAREA AREA(ACRES) =    83.22       SUBAREA RUNOFF(CFS) =  137.12
  EFFECTIVE AREA(ACRES) =   2690.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3940.4          PEAK FLOW RATE(CFS) =    4685.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.78   FLOW VELOCITY(FEET/SEC.) =  16.22
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4685.39   23.42    2.131  0.30( 0.30) 1.00    2689.6   11250.00
      2     4685.47   23.43    2.131  0.30( 0.30) 1.00    2690.1   11130.00
      3     4656.80   24.14    2.081  0.30( 0.30) 1.00    2749.8   11220.00
      4     4464.90   39.77    1.541  0.30( 0.30) 1.00    3890.8   11111.00
      5     4439.67   40.57    1.525  0.30( 0.30) 1.00    3932.7   11201.00
      6     4412.66   40.95    1.519  0.30( 0.30) 1.00    3940.4   11101.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      454.90   21.87    2.238  0.30( 0.30) 1.00     260.8   11300.00
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)     NODE
     1     5086.00   21.87    2.238  0.30( 0.30) 1.00    2773.1   11300.00
     2     5115.28   23.42    2.131  0.30( 0.30) 1.00    2950.4   11250.00
     3     5115.27   23.43    2.131  0.30( 0.30) 1.00    2951.0   11130.00
     4     5075.03   24.14    2.081  0.30( 0.30) 1.00    3010.7   11220.00
     5     4756.22   39.77    1.541  0.30( 0.30) 1.00    4151.6   11111.00
     6     4727.24   40.57    1.525  0.30( 0.30) 1.00    4193.6   11201.00
     7     4698.79   40.95    1.519  0.30( 0.30) 1.00    4201.2   11101.00
   TOTAL AREA(ACRES) =      4201.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     5115.28  Tc(MIN.) =   23.419
 EFFECTIVE AREA(ACRES) =   2950.45  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4201.2
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1222.10  DOWNSTREAM(FEET) =   1092.58
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3157.19   CHANNEL SLOPE =  0.0410
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.66
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.956
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      328.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5360.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.14
 AVERAGE FLOW DEPTH(FEET) =  10.62   TRAVEL TIME(MIN.) =   3.26
 Tc(MIN.) =   26.68
 SUBAREA AREA(ACRES) =   328.55       SUBAREA RUNOFF(CFS) =  489.65
 EFFECTIVE AREA(ACRES) =   3279.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     4529.8         PEAK FLOW RATE(CFS) =    5115.28
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.40

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.40   FLOW VELOCITY(FEET/SEC.) =  15.96
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   26.68
 RAINFALL INTENSITY(INCH/HR) =   1.96
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    3279.00
 TOTAL STREAM AREA(ACRES) =    4529.77
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    5115.28

****************************************************************************
 FLOW PROCESS FROM NODE  11330.00 TO NODE  11331.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.83
 ELEVATION DATA: UPSTREAM(FEET) =   3270.16  DOWNSTREAM(FEET) =   3123.64

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.975
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.762
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        1.69      0.30     1.000     0    7.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      6.79
 TOTAL AREA(ACRES) =      1.69   PEAK FLOW RATE(CFS) =      6.79

****************************************************************************
 FLOW PROCESS FROM NODE  11331.00 TO NODE  11332.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3123.64  DOWNSTREAM(FEET) =   2903.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =   710.41   CHANNEL SLOPE =  0.3104
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.801
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        5.82      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.03
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.59
 AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   2.12
 Tc(MIN.) =   10.09
 SUBAREA AREA(ACRES) =     5.82       SUBAREA RUNOFF(CFS) =   18.34
 EFFECTIVE AREA(ACRES) =      7.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.5         PEAK FLOW RATE(CFS) =      23.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   6.39
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11332.00 =    1010.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11332.00 TO NODE  11333.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.10  DOWNSTREAM(FEET) =   2718.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   843.93   CHANNEL SLOPE =  0.2183
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.51
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.404
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.78
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   2.08
  Tc(MIN.) =   12.17
  SUBAREA AREA(ACRES) =     9.66       SUBAREA RUNOFF(CFS) =   26.99
  EFFECTIVE AREA(ACRES) =     17.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.2         PEAK FLOW RATE(CFS) =      47.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   7.45
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11333.00 =    1854.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11333.00 TO NODE  11334.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2718.89  DOWNSTREAM(FEET) =   2364.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1084.60   CHANNEL SLOPE =  0.3264
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.031
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.28
  AVERAGE FLOW DEPTH(FEET) =   0.60   TRAVEL TIME(MIN.) =   1.95
  Tc(MIN.) =   14.12
  SUBAREA AREA(ACRES) =    11.67       SUBAREA RUNOFF(CFS) =   28.69
  EFFECTIVE AREA(ACRES) =     28.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.8         PEAK FLOW RATE(CFS) =      70.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   9.73
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11334.00 =    2938.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11334.00 TO NODE  11335.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2364.84  DOWNSTREAM(FEET) =   1729.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.08   CHANNEL SLOPE =  0.3237
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.17
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.705
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      102.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     182.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.24
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   2.47
  Tc(MIN.) =   16.59
  SUBAREA AREA(ACRES) =   102.74       SUBAREA RUNOFF(CFS) =  222.39
  EFFECTIVE AREA(ACRES) =    131.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      131.6         PEAK FLOW RATE(CFS) =     284.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.44   FLOW VELOCITY(FEET/SEC.) =  15.29
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11335.00 =    4901.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1729.46  DOWNSTREAM(FEET) =   1092.58
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2702.07   CHANNEL SLOPE =  0.2357
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.405
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       90.38      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     370.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.86
 AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   3.03
 Tc(MIN.) =   19.62
 SUBAREA AREA(ACRES) =    90.38       SUBAREA RUNOFF(CFS) =  171.24
 EFFECTIVE AREA(ACRES) =    221.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      222.0         PEAK FLOW RATE(CFS) =     420.53
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.96

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =  15.43
 LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11340.00 =    7603.92 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   19.62
 RAINFALL INTENSITY(INCH/HR) =   2.41
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     221.96
 TOTAL STREAM AREA(ACRES) =     221.96
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     420.53

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5086.00   25.14    2.017  0.30( 0.30) 1.00    3101.6   11300.00
     1     5115.28   26.68    1.956  0.30( 0.30) 1.00    3279.0   11250.00
     1     5115.27   26.68    1.956  0.30( 0.30) 1.00    3279.5   11130.00
     1     5075.03   27.40    1.927  0.30( 0.30) 1.00    3339.2   11220.00
     1     4776.43   43.09    1.485  0.30( 0.30) 1.00    4480.2   11111.00
     1     4768.06   43.91    1.471  0.30( 0.30) 1.00    4522.1   11201.00
     1     4750.97   44.29    1.465  0.30( 0.30) 1.00    4529.8   11101.00
     2      420.53   19.62    2.405  0.30( 0.30) 1.00     222.0   11330.00
```



```
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5287.39   19.62    2.405  0.30( 0.30) 1.00    2642.2   11330.00
     2     5428.92   25.14    2.017  0.30( 0.30) 1.00    3323.6   11300.00
     3     5446.07   26.68    1.956  0.30( 0.30) 1.00    3501.0   11250.00
     4     5446.02   26.68    1.956  0.30( 0.30) 1.00    3501.5   11130.00
     5     5400.11   27.40    1.927  0.30( 0.30) 1.00    3561.2   11220.00
     6     5013.06   43.09    1.485  0.30( 0.30) 1.00    4702.2   11111.00
     7     5002.09   43.91    1.471  0.30( 0.30) 1.00    4744.1   11201.00
     8     4983.76   44.29    1.465  0.30( 0.30) 1.00    4751.7   11101.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    5446.07    Tc(MIN.) =    26.68
 EFFECTIVE AREA(ACRES) =    3500.96   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4751.7
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11340.00 TO NODE  11341.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1092.58  DOWNSTREAM(FEET) =   1055.49
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.69   CHANNEL SLOPE =  0.0259
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.88
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.887
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       54.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5485.03
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.67
 AVERAGE FLOW DEPTH(FEET) =  11.88   TRAVEL TIME(MIN.) =   1.75
 Tc(MIN.) =   28.43
 SUBAREA AREA(ACRES) =    54.55       SUBAREA RUNOFF(CFS) =   77.92
 EFFECTIVE AREA(ACRES) =   3555.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     4806.3         PEAK FLOW RATE(CFS) =    5446.07
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.85

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 11.85   FLOW VELOCITY(FEET/SEC.) =  13.65
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11341.00 =   30452.74 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11341.00 TO NODE  11342.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1055.49  DOWNSTREAM(FEET) =   1017.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.89   CHANNEL SLOPE =  0.0406
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.81
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.849
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      119.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5529.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.21
  AVERAGE FLOW DEPTH(FEET) =  10.80   TRAVEL TIME(MIN.) =   0.97
  Tc(MIN.) =   29.40
  SUBAREA AREA(ACRES) =   119.96       SUBAREA RUNOFF(CFS) =  167.22
  EFFECTIVE AREA(ACRES) =   3675.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4926.2         PEAK FLOW RATE(CFS) =    5446.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.72   FLOW VELOCITY(FEET/SEC.) =  16.15
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11342.00 =   31396.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1017.16  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1557.63   CHANNEL SLOPE =  0.0383
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.92
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.795
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.25      0.30     0.990     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5503.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.84
  AVERAGE FLOW DEPTH(FEET) =  10.91   TRAVEL TIME(MIN.) =   1.64
  Tc(MIN.) =   31.03
  SUBAREA AREA(ACRES) =    85.25       SUBAREA RUNOFF(CFS) =  114.93
```



```
  EFFECTIVE AREA(ACRES) =   3760.72     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5011.5         PEAK FLOW RATE(CFS) =    5446.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.87   FLOW VELOCITY(FEET/SEC.) =  15.79
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.03
  RAINFALL INTENSITY(INCH/HR) =   1.79
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3760.72
  TOTAL STREAM AREA(ACRES) =    5011.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    5446.07

****************************************************************************
  FLOW PROCESS FROM NODE  11350.00 TO NODE  11351.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.54
  ELEVATION DATA: UPSTREAM(FEET) =   2805.98  DOWNSTREAM(FEET) =   2583.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.655
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.928
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.40      0.30     1.000     0   14.66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.77
  TOTAL AREA(ACRES) =      5.40   PEAK FLOW RATE(CFS) =     12.77

****************************************************************************
  FLOW PROCESS FROM NODE  11351.00 TO NODE  11352.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2583.16  DOWNSTREAM(FEET) =   2403.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.57   CHANNEL SLOPE =  0.1876
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.47
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.628
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.90
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   17.36
  SUBAREA AREA(ACRES) =    15.56       SUBAREA RUNOFF(CFS) =   32.61
  EFFECTIVE AREA(ACRES) =     20.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.0         PEAK FLOW RATE(CFS) =      43.92
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   6.85
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11352.00 =    1907.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11352.00 TO NODE  11353.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2403.73  DOWNSTREAM(FEET) =   1786.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.85   CHANNEL SLOPE =  0.3190
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.89
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.352
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       74.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     112.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.29
  AVERAGE FLOW DEPTH(FEET) =   0.85   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =   20.22
  SUBAREA AREA(ACRES) =    74.05       SUBAREA RUNOFF(CFS) =  136.77
  EFFECTIVE AREA(ACRES) =     95.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       95.0         PEAK FLOW RATE(CFS) =     175.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =  13.06
```



```
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11353.00 =    3840.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11353.00 TO NODE  11354.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1786.74  DOWNSTREAM(FEET) =   1308.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2073.35   CHANNEL SLOPE =  0.2307
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.35
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.160
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     209.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.38
  AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   23.01
  SUBAREA AREA(ACRES) =    41.22       SUBAREA RUNOFF(CFS) =   68.99
  EFFECTIVE AREA(ACRES) =    136.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      136.2         PEAK FLOW RATE(CFS) =     228.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.40   FLOW VELOCITY(FEET/SEC.) =  12.71
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11354.00 =    5914.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.39  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2455.49   CHANNEL SLOPE =  0.1429
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.972
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      201.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     379.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.55
  AVERAGE FLOW DEPTH(FEET) =   2.12   TRAVEL TIME(MIN.) =   3.26
  Tc(MIN.) =   26.27
```

```
  SUBAREA AREA(ACRES) =   201.53       SUBAREA RUNOFF(CFS) =  303.29
  EFFECTIVE AREA(ACRES) =    337.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      337.8         PEAK FLOW RATE(CFS) =     508.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.48   FLOW VELOCITY(FEET/SEC.) =  13.67
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11360.00 =    8369.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.27
  RAINFALL INTENSITY(INCH/HR) =   1.97
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     337.76
  TOTAL STREAM AREA(ACRES) =     337.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     508.30

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     5287.39   24.00    2.091  0.30( 0.30) 1.00    2902.0   11330.00
      1     5428.92   29.50    1.845  0.30( 0.30) 1.00    3583.3   11300.00
      1     5446.07   31.03    1.795  0.30( 0.30) 1.00    3760.7   11250.00
      1     5446.02   31.04    1.795  0.30( 0.30) 1.00    3761.2   11130.00
      1     5400.11   31.77    1.773  0.30( 0.30) 1.00    3820.9   11220.00
      1     5013.06   47.54    1.413  0.30( 0.30) 1.00    4961.9   11111.00
      1     5002.09   48.36    1.400  0.30( 0.30) 1.00    5003.8   11201.00
      1     4983.76   48.75    1.394  0.30( 0.30) 1.00    5011.5   11101.00
      2      508.30   26.27    1.972  0.30( 0.30) 1.00     337.8   11350.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     5784.85   24.00    2.091  0.30( 0.30) 1.00    3210.6   11330.00
      2     5854.04   26.27    1.972  0.30( 0.30) 1.00    3520.6   11350.00
      3     5898.54   29.50    1.845  0.30( 0.30) 1.00    3921.1   11300.00
      4     5900.51   31.03    1.795  0.30( 0.30) 1.00    4098.5   11250.00
      5     5900.41   31.04    1.795  0.30( 0.30) 1.00    4099.0   11130.00
      6     5848.05   31.77    1.773  0.30( 0.30) 1.00    4158.7   11220.00
      7     5351.51   47.54    1.413  0.30( 0.30) 1.00    5299.7   11111.00
      8     5336.56   48.36    1.400  0.30( 0.30) 1.00    5341.6   11201.00
      9     5316.34   48.75    1.394  0.30( 0.30) 1.00    5349.2   11101.00
```



```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    5900.51    Tc(MIN.) =    31.03
  EFFECTIVE AREA(ACRES) =    4098.48   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5349.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11360.00 TO NODE  11361.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    957.53  DOWNSTREAM(FEET) =    847.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2937.03   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.42
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.706
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      176.74      0.30     0.977     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6012.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.06
  AVERAGE FLOW DEPTH(FEET) =  11.41   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   34.08
  SUBAREA AREA(ACRES) =   176.74       SUBAREA RUNOFF(CFS) =  224.79
  EFFECTIVE AREA(ACRES) =   4275.22     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5526.0         PEAK FLOW RATE(CFS) =    5900.51
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.32   FLOW VELOCITY(FEET/SEC.) =  15.98
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11361.00 =   35891.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11361.00 TO NODE  11362.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    847.62  DOWNSTREAM(FEET) =    738.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3869.90   CHANNEL SLOPE =  0.0283
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.30
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.577
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      429.50      0.30     0.995     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6147.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.53
  AVERAGE FLOW DEPTH(FEET) =  12.26   TRAVEL TIME(MIN.) =   4.44
  Tc(MIN.) =   38.52
  SUBAREA AREA(ACRES) =   429.50       SUBAREA RUNOFF(CFS) =  494.25
  EFFECTIVE AREA(ACRES) =   4704.72     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5955.5          PEAK FLOW RATE(CFS) =    5900.51
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.04   FLOW VELOCITY(FEET/SEC.) =  14.39
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11362.00 =   39761.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    738.28  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2987.23   CHANNEL SLOPE =  0.0199
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.07
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.495
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.97      0.30     0.991     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.991
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5968.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.64
  AVERAGE FLOW DEPTH(FEET) =  13.06   TRAVEL TIME(MIN.) =   3.94
  Tc(MIN.) =   42.46
  SUBAREA AREA(ACRES) =   125.97       SUBAREA RUNOFF(CFS) =  135.76
  EFFECTIVE AREA(ACRES) =   4830.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6081.5          PEAK FLOW RATE(CFS) =    5900.51
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.00   FLOW VELOCITY(FEET/SEC.) =  12.61
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11363.00 =   42748.42 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     6081.5  TC(MIN.) =     42.46
  EFFECTIVE AREA(ACRES) =   4830.69  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.998
```



```
  PEAK FLOW RATE(CFS)   =    5900.51

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5784.85   35.47    1.666  0.30( 0.30) 1.00    3942.8   11330.00
      2     5854.04   37.70    1.601  0.30( 0.30) 1.00    4252.8   11350.00
      3     5898.54   40.91    1.519  0.30( 0.30) 1.00    4653.3   11300.00
      4     5900.51   42.46    1.495  0.30( 0.30) 1.00    4830.7   11250.00
      5     5900.41   42.46    1.495  0.30( 0.30) 1.00    4831.2   11130.00
      6     5848.05   43.22    1.483  0.30( 0.30) 1.00    4890.9   11220.00
      7     5505.59   59.23    1.306  0.30( 0.30) 1.00    6031.9   11111.00
      8     5511.87   60.05    1.300  0.30( 0.30) 1.00    6073.8   11201.00
      9     5503.29   60.45    1.297  0.30( 0.30) 1.00    6081.5   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S14.DAT
  TIME/DATE OF STUDY: 10:07 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.076
   2)   10.00;  3.785
   3)   15.00;  2.842
   4)   20.00;  2.353
   5)   25.00;  2.012
   6)   30.00;  1.815
   7)   40.00;  1.527
   8)   50.00;  1.366
   9)   60.00;  1.290
  10)   90.00;  1.083
  11)  120.00;  0.953
  12)  180.00;  0.842
  13)  360.00;  0.642
  14) 1440.00;  0.288
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11401.00 TO NODE  11401.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   313.41
  ELEVATION DATA: UPSTREAM(FEET) =   3384.11  DOWNSTREAM(FEET) =   3232.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.137
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.639
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.25      0.30     1.000     0    8.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.79
  TOTAL AREA(ACRES) =      2.25   PEAK FLOW RATE(CFS) =      8.79

**************************************************************************
  FLOW PROCESS FROM NODE  11401.50 TO NODE  11402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3232.76  DOWNSTREAM(FEET) =   3001.05
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.75   CHANNEL SLOPE =  0.3733
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.988
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.29
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   1.42
  Tc(MIN.) =    9.56
  SUBAREA AREA(ACRES) =    11.39       SUBAREA RUNOFF(CFS) =   37.81
  EFFECTIVE AREA(ACRES) =     13.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.6          PEAK FLOW RATE(CFS) =      45.28
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.48   FLOW VELOCITY(FEET/SEC.) =   8.65
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11402.00 =     934.16 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11402.00 TO NODE  11403.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3001.05  DOWNSTREAM(FEET) =   2787.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.99   CHANNEL SLOPE =  0.2213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.534
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      83.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.06
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   1.77
  Tc(MIN.) =   11.33
  SUBAREA AREA(ACRES) =    26.43       SUBAREA RUNOFF(CFS) =   76.94
  EFFECTIVE AREA(ACRES) =     40.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =     116.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =  10.12
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11403.00 =    1897.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11403.00 TO NODE  11404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2787.96  DOWNSTREAM(FEET) =   2518.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1956.80   CHANNEL SLOPE =  0.1376
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.57
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.931
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       67.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     197.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.19
  AVERAGE FLOW DEPTH(FEET) =   1.49   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   14.53
  SUBAREA AREA(ACRES) =    67.85       SUBAREA RUNOFF(CFS) =  160.65
  EFFECTIVE AREA(ACRES) =    107.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.9         PEAK FLOW RATE(CFS) =     255.52
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.73   FLOW VELOCITY(FEET/SEC.) =  11.00
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11404.00 =    3853.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11404.00 TO NODE  11405.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2518.71  DOWNSTREAM(FEET) =   2304.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.99   CHANNEL SLOPE =  0.1101
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.602
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     339.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.09
  AVERAGE FLOW DEPTH(FEET) =   2.14   TRAVEL TIME(MIN.) =   2.92
  Tc(MIN.) =   17.45
  SUBAREA AREA(ACRES) =    80.61       SUBAREA RUNOFF(CFS) =  167.02
  EFFECTIVE AREA(ACRES) =    188.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      188.5         PEAK FLOW RATE(CFS) =     390.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.31   FLOW VELOCITY(FEET/SEC.) =  11.54
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11405.00 =    5798.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11405.00 TO NODE  11406.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2304.57  DOWNSTREAM(FEET) =   1888.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3280.59   CHANNEL SLOPE =  0.1270
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.56
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.239
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      111.04      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     487.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.95
  AVERAGE FLOW DEPTH(FEET) =   2.51   TRAVEL TIME(MIN.) =   4.22
  Tc(MIN.) =   21.67
  SUBAREA AREA(ACRES) =   111.04       SUBAREA RUNOFF(CFS) =  193.77
  EFFECTIVE AREA(ACRES) =    299.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      299.6         PEAK FLOW RATE(CFS) =     522.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.60   FLOW VELOCITY(FEET/SEC.) =  13.20
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11406.00 =    9079.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11406.00 TO NODE  11407.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1888.00  DOWNSTREAM(FEET) =   1539.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2842.33   CHANNEL SLOPE =  0.1226
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.94
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.007
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     631.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.75
  AVERAGE FLOW DEPTH(FEET) =   2.90   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   25.12
  SUBAREA AREA(ACRES) =   141.19       SUBAREA RUNOFF(CFS) =  216.96
  EFFECTIVE AREA(ACRES) =    440.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      440.8         PEAK FLOW RATE(CFS) =     677.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.01   FLOW VELOCITY(FEET/SEC.) =  14.04
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11407.00 =   11921.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11407.00 TO NODE  11408.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   1539.46  DOWNSTREAM(FEET) =   1268.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2859.01   CHANNEL SLOPE =  0.0948
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.51
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.867
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      158.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     789.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.35
  AVERAGE FLOW DEPTH(FEET) =   3.48   TRAVEL TIME(MIN.) =   3.57
  Tc(MIN.) =   28.69
  SUBAREA AREA(ACRES) =   158.63       SUBAREA RUNOFF(CFS) =  223.68
  EFFECTIVE AREA(ACRES) =    599.39     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      599.4         PEAK FLOW RATE(CFS) =     845.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.61   FLOW VELOCITY(FEET/SEC.) =  13.59
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11408.00 =   14780.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11408.00 TO NODE  11409.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1268.36  DOWNSTREAM(FEET) =   1109.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2883.36   CHANNEL SLOPE =  0.0550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.49
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.733
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      208.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     979.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.59
  AVERAGE FLOW DEPTH(FEET) =   4.47   TRAVEL TIME(MIN.) =   4.15
  Tc(MIN.) =   32.83
  SUBAREA AREA(ACRES) =   208.66       SUBAREA RUNOFF(CFS) =  269.19
  EFFECTIVE AREA(ACRES) =    808.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      808.1         PEAK FLOW RATE(CFS) =    1042.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.60
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.60   FLOW VELOCITY(FEET/SEC.) =  11.79
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.00 =   17664.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.00 TO NODE  11409.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1109.80  DOWNSTREAM(FEET) =    953.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2734.25   CHANNEL SLOPE =  0.0572
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.69
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.625
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       97.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1100.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.14
  AVERAGE FLOW DEPTH(FEET) =   4.68   TRAVEL TIME(MIN.) =   3.75
  Tc(MIN.) =   36.59
  SUBAREA AREA(ACRES) =    97.66       SUBAREA RUNOFF(CFS) =  116.49
  EFFECTIVE AREA(ACRES) =    905.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      905.7         PEAK FLOW RATE(CFS) =    1080.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.64   FLOW VELOCITY(FEET/SEC.) =  12.07
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.50 =   20398.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.50 TO NODE  11410.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    953.45  DOWNSTREAM(FEET) =    914.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.66   CHANNEL SLOPE =  0.0357
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.39
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.574
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      130.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1155.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.33
```



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  AVERAGE FLOW DEPTH(FEET) =   5.38   TRAVEL TIME(MIN.) =   1.78
  Tc(MIN.) =   38.36
  SUBAREA AREA(ACRES) =   130.64       SUBAREA RUNOFF(CFS) =  149.82
  EFFECTIVE AREA(ACRES) =   1036.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1036.4         PEAK FLOW RATE(CFS) =    1188.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.46   FLOW VELOCITY(FEET/SEC.) =  10.41
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11410.00 =   21499.14 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11410.00 TO NODE  11411.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    914.20  DOWNSTREAM(FEET) =    740.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3015.96   CHANNEL SLOPE =  0.0576
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.19
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.490
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      299.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1349.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.84
  AVERAGE FLOW DEPTH(FEET) =   5.17   TRAVEL TIME(MIN.) =   3.92
  Tc(MIN.) =   42.28
  SUBAREA AREA(ACRES) =   299.66       SUBAREA RUNOFF(CFS) =  321.04
  EFFECTIVE AREA(ACRES) =   1336.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1336.0         PEAK FLOW RATE(CFS) =    1431.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.32   FLOW VELOCITY(FEET/SEC.) =  13.03
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11411.00 =   24515.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.43  DOWNSTREAM(FEET) =    651.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1605.97   CHANNEL SLOPE =  0.0553
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

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 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.44
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.457
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       70.41      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1467.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.94
 AVERAGE FLOW DEPTH(FEET) =   5.44   TRAVEL TIME(MIN.) =   2.07
 Tc(MIN.) =   44.35
 SUBAREA AREA(ACRES) =    70.41       SUBAREA RUNOFF(CFS) =   73.32
 EFFECTIVE AREA(ACRES) =   1406.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1406.4         PEAK FLOW RATE(CFS) =    1464.59
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.43

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.43   FLOW VELOCITY(FEET/SEC.) =  12.91
 LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11431.00 =   26121.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S10.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1    11874.63   24.58  0.30( 0.30) 1.00    4274.9   11000.00
     2    13555.94   36.97  0.30( 0.30) 1.00    7319.0   10850.00
     3    13652.81   37.84  0.30( 0.30) 1.00    7539.3   10800.00
     4    13867.44   39.66  0.30( 0.30) 1.00    8077.3   10900.00
     5    14120.57   42.76  0.30( 0.30) 1.00    8902.7   10830.00
     6    14121.94   42.79  0.30( 0.30) 1.00    8909.8   10910.00
     7    14127.90   43.78  0.30( 0.30) 1.00    9113.5   10630.00
     8    14090.30   54.74  0.30( 0.30) 1.00   11511.9   10600.00
     9    14228.13   61.37  0.30( 0.30) 1.00   12987.2   10500.00
    10    14319.75   65.59  0.30( 0.30) 1.00   13870.6   10710.00
    11    14315.66   67.53  0.30( 0.30) 1.00   14202.7   10410.00
    12    14143.87   72.01  0.30( 0.30) 1.00   14863.7   10700.00
    13    13902.44   78.72  0.30( 0.30) 1.00   15782.8   10400.00
    14    13870.86   80.96  0.30( 0.30) 1.00   16052.6   10200.00
    15    13650.44   86.64  0.30( 0.30) 1.00   16631.8   10300.00
    16    13640.51   86.83  0.30( 0.30) 1.00   16644.6   10320.00
    17    13314.82   91.42  0.30( 0.30) 1.00   16836.5   10210.00
    18    11879.54  117.21  0.30( 0.30) 1.00   17533.1   10100.00
  TOTAL AREA(ACRES) =    17533.1
```



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****************************************************************************
 FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S13.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     5784.85   35.47  0.30( 0.30) 1.00    3942.8   11330.00
     2     5854.04   37.70  0.30( 0.30) 1.00    4252.8   11350.00
     3     5898.54   40.91  0.30( 0.30) 1.00    4653.3   11300.00
     4     5900.51   42.46  0.30( 0.30) 1.00    4830.7   11250.00
     5     5900.41   42.46  0.30( 0.30) 1.00    4831.2   11130.00
     6     5848.05   43.22  0.30( 0.30) 1.00    4890.9   11220.00
     7     5505.59   59.23  0.30( 0.30) 1.00    6031.9   11111.00
     8     5511.87   60.05  0.30( 0.30) 1.00    6073.8   11201.00
     9     5503.29   60.45  0.30( 0.30) 1.00    6081.5   11101.00
  TOTAL AREA(ACRES) =     6081.5

****************************************************************************
 FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     5784.85   35.47  0.30( 0.30) 1.00    3942.8   11330.00
     2     5854.04   37.70  0.30( 0.30) 1.00    4252.8   11350.00
     3     5898.54   40.91  0.30( 0.30) 1.00    4653.3   11300.00
     4     5900.51   42.46  0.30( 0.30) 1.00    4830.7   11250.00
     5     5900.41   42.46  0.30( 0.30) 1.00    4831.2   11130.00
     6     5848.05   43.22  0.30( 0.30) 1.00    4890.9   11220.00
     7     5505.59   59.23  0.30( 0.30) 1.00    6031.9   11111.00
     8     5511.87   60.05  0.30( 0.30) 1.00    6073.8   11201.00
     9     5503.29   60.45  0.30( 0.30) 1.00    6081.5   11101.00
  TOTAL AREA(ACRES) =      6081.5

****************************************************************************
 FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5784.85   35.47    1.658  0.30( 0.30) 1.00    3942.8   11330.00
     2     5854.04   37.70    1.593  0.30( 0.30) 1.00    4252.8   11350.00
     3     5898.54   40.91    1.512  0.30( 0.30) 1.00    4653.3   11300.00
     4     5900.51   42.46    1.487  0.30( 0.30) 1.00    4830.7   11250.00
     5     5900.41   42.46    1.487  0.30( 0.30) 1.00    4831.2   11130.00
     6     5848.05   43.22    1.475  0.30( 0.30) 1.00    4890.9   11220.00
     7     5505.59   59.23    1.296  0.30( 0.30) 1.00    6031.9   11111.00
     8     5511.87   60.05    1.290  0.30( 0.30) 1.00    6073.8   11201.00
```

9	5503.29	60.45	1.287	0.30(0.30)	1.00	6081.5	11101.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11874.63	24.58	2.041	0.30(0.30)	1.00	4274.9	11000.00
2	13555.94	36.97	1.614	0.30(0.30)	1.00	7319.0	10850.00
3	13652.81	37.84	1.589	0.30(0.30)	1.00	7539.3	10800.00
4	13867.44	39.66	1.537	0.30(0.30)	1.00	8077.3	10900.00
5	14120.57	42.76	1.483	0.30(0.30)	1.00	8902.7	10830.00
6	14121.94	42.79	1.482	0.30(0.30)	1.00	8909.8	10910.00
7	14127.90	43.78	1.466	0.30(0.30)	1.00	9113.5	10630.00
8	14090.30	54.74	1.330	0.30(0.30)	1.00	11511.9	10600.00
9	14228.13	61.37	1.281	0.30(0.30)	1.00	12987.2	10500.00
10	14319.75	65.59	1.251	0.30(0.30)	1.00	13870.6	10710.00
11	14315.66	67.53	1.238	0.30(0.30)	1.00	14202.7	10410.00
12	14143.87	72.01	1.207	0.30(0.30)	1.00	14863.7	10700.00
13	13902.44	78.72	1.161	0.30(0.30)	1.00	15782.8	10400.00
14	13870.86	80.96	1.145	0.30(0.30)	1.00	16052.6	10200.00
15	13650.44	86.64	1.106	0.30(0.30)	1.00	16631.8	10300.00
16	13640.51	86.83	1.105	0.30(0.30)	1.00	16644.6	10320.00
17	13314.82	91.42	1.077	0.30(0.30)	1.00	16836.5	10210.00
18	11879.54	117.21	0.965	0.30(0.30)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17014.57	24.58	2.041	0.30(0.30)	1.00	7007.1	11000.00
2	19137.05	35.47	1.658	0.30(0.30)	1.00	10892.9	11330.00
3	19387.28	36.97	1.614	0.30(0.30)	1.00	11470.1	10850.00
4	19490.87	37.70	1.593	0.30(0.30)	1.00	11755.8	11350.00
5	19508.86	37.84	1.589	0.30(0.30)	1.00	11810.2	10800.00
6	19748.57	39.66	1.537	0.30(0.30)	1.00	12573.9	10900.00
7	19868.51	40.91	1.512	0.30(0.30)	1.00	13065.0	11300.00
8	19996.32	42.46	1.487	0.30(0.30)	1.00	13652.7	11250.00
9	19996.70	42.46	1.487	0.30(0.30)	1.00	13654.8	11130.00
10	20000.26	42.76	1.483	0.30(0.30)	1.00	13757.6	10830.00
11	19999.60	42.79	1.482	0.30(0.30)	1.00	13767.0	10910.00
12	19972.54	43.22	1.475	0.30(0.30)	1.00	13887.9	11220.00
13	19963.79	43.78	1.466	0.30(0.30)	1.00	14044.9	10630.00
14	19691.88	54.74	1.330	0.30(0.30)	1.00	17224.0	10600.00
15	19689.18	59.23	1.296	0.30(0.30)	1.00	18542.3	11111.00
16	19712.66	60.05	1.290	0.30(0.30)	1.00	18768.3	11201.00
17	19712.34	60.45	1.287	0.30(0.30)	1.00	18864.4	11101.00
18	19696.12	61.37	1.281	0.30(0.30)	1.00	19068.7	10500.00
19	19625.43	65.59	1.251	0.30(0.30)	1.00	19952.0	10710.00
20	19546.90	67.53	1.238	0.30(0.30)	1.00	20284.1	10410.00
21	19202.49	72.01	1.207	0.30(0.30)	1.00	20945.1	10700.00
22	18703.19	78.72	1.161	0.30(0.30)	1.00	21864.2	10400.00
23	18585.36	80.96	1.145	0.30(0.30)	1.00	22134.0	10200.00
24	18146.41	86.64	1.106	0.30(0.30)	1.00	22713.3	10300.00
25	18129.31	86.83	1.105	0.30(0.30)	1.00	22726.0	10320.00
26	17647.50	91.42	1.077	0.30(0.30)	1.00	22917.9	10210.00
27	15589.13	117.21	0.965	0.30(0.30)	1.00	23614.5	10100.00

TOTAL AREA(ACRES) = 23614.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 20000.26 Tc(MIN.) = 42.761
EFFECTIVE AREA(ACRES) = 13757.55 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 23614.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

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FLOW PROCESS FROM NODE 11363.00 TO NODE 11431.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 678.93 DOWNSTREAM(FEET) = 651.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 2069.94 CHANNEL SLOPE = 0.0132
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050
*ESTIMATED CHANNEL HEIGHT(FEET) = 16.39
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.447
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.16	0.30	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20085.56
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.50
AVERAGE FLOW DEPTH(FEET) = 16.38 TRAVEL TIME(MIN.) = 2.23
Tc(MIN.) = 44.99
SUBAREA AREA(ACRES) = 165.16 SUBAREA RUNOFF(CFS) = 170.60
EFFECTIVE AREA(ACRES) = 13922.71 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 23779.7 PEAK FLOW RATE(CFS) = 20000.26
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050
*ESTIMATED CHANNEL HEIGHT(FEET) = 16.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 16.34 FLOW VELOCITY(FEET/SEC.) = 15.49
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

****
FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17014.57	26.89	1.937	0.30(0.30)	1.00	7172.3	11000.00
2	19137.05	37.71	1.593	0.30(0.30)	1.00	11058.1	11330.00
3	19387.28	39.21	1.550	0.30(0.30)	1.00	11635.3	10850.00
4	19490.87	39.94	1.529	0.30(0.30)	1.00	11921.0	11350.00
5	19508.86	40.08	1.526	0.30(0.30)	1.00	11975.4	10800.00
6	19748.57	41.89	1.497	0.30(0.30)	1.00	12739.1	10900.00
7	19868.51	43.14	1.476	0.30(0.30)	1.00	13230.1	11300.00

8	19996.32	44.68	1.452	0.30(0.30)	1.00	13817.8	11250.00
9	19996.70	44.69	1.452	0.30(0.30)	1.00	13819.9	11130.00
10	20000.26	44.99	1.447	0.30(0.30)	1.00	13922.7	10830.00
11	19999.60	45.02	1.446	0.30(0.30)	1.00	13932.2	10910.00
12	19972.54	45.44	1.439	0.30(0.30)	1.00	14053.1	11220.00
13	19963.79	46.01	1.430	0.30(0.30)	1.00	14210.1	10630.00
14	19691.88	56.97	1.313	0.30(0.30)	1.00	17389.1	10600.00
15	19689.18	61.46	1.280	0.30(0.30)	1.00	18707.4	11111.00
16	19712.66	62.29	1.274	0.30(0.30)	1.00	18933.4	11201.00
17	19712.34	62.69	1.271	0.30(0.30)	1.00	19029.6	11101.00
18	19696.12	63.60	1.265	0.30(0.30)	1.00	19233.8	10500.00
19	19625.43	67.83	1.236	0.30(0.30)	1.00	20117.2	10710.00
20	19546.90	69.76	1.223	0.30(0.30)	1.00	20449.3	10410.00
21	19202.49	74.26	1.192	0.30(0.30)	1.00	21110.3	10700.00
22	18703.19	80.98	1.145	0.30(0.30)	1.00	22029.4	10400.00
23	18585.36	83.23	1.130	0.30(0.30)	1.00	22299.2	10200.00
24	18146.41	88.93	1.090	0.30(0.30)	1.00	22878.5	10300.00
25	18129.31	89.11	1.089	0.30(0.30)	1.00	22891.2	10320.00
26	17647.50	93.72	1.067	0.30(0.30)	1.00	23083.1	10210.00
27	15589.13	119.59	0.955	0.30(0.30)	1.00	23779.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1464.59	44.35	1.457	0.30(0.30)	1.00	1406.4	11401.00

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18271.49	26.89	1.937	0.30(0.30)	1.00	8025.2	11000.00
2	20528.79	37.71	1.593	0.30(0.30)	1.00	12254.2	11330.00
3	20786.00	39.21	1.550	0.30(0.30)	1.00	12878.7	10850.00
4	20891.66	39.94	1.529	0.30(0.30)	1.00	13187.6	11350.00
5	20911.18	40.08	1.526	0.30(0.30)	1.00	13246.6	10800.00
6	21179.27	41.89	1.497	0.30(0.30)	1.00	14067.5	10900.00
7	21317.19	43.14	1.476	0.30(0.30)	1.00	14598.3	11300.00
8	21433.15	44.35	1.457	0.30(0.30)	1.00	15096.6	11401.00
9	21454.10	44.68	1.452	0.30(0.30)	1.00	15224.3	11250.00
10	21454.35	44.69	1.452	0.30(0.30)	1.00	15226.4	11130.00
11	21451.83	44.99	1.447	0.30(0.30)	1.00	15329.1	10830.00
12	21450.57	45.02	1.446	0.30(0.30)	1.00	15338.6	10910.00
13	21414.84	45.44	1.439	0.30(0.30)	1.00	15459.5	11220.00
14	21394.48	46.01	1.430	0.30(0.30)	1.00	15616.5	10630.00
15	20974.20	56.97	1.313	0.30(0.30)	1.00	18795.6	10600.00
16	20929.62	61.46	1.280	0.30(0.30)	1.00	20113.9	11111.00
17	20945.89	62.29	1.274	0.30(0.30)	1.00	20339.9	11201.00
18	20942.10	62.69	1.271	0.30(0.30)	1.00	20436.0	11101.00
19	20917.86	63.60	1.265	0.30(0.30)	1.00	20640.2	10500.00
20	20810.29	67.83	1.236	0.30(0.30)	1.00	21523.6	10710.00
21	20714.83	69.76	1.223	0.30(0.30)	1.00	21855.7	10410.00
22	20331.12	74.26	1.192	0.30(0.30)	1.00	22516.7	10700.00
23	19773.12	80.98	1.145	0.30(0.30)	1.00	23435.8	10400.00
24	19635.68	83.23	1.130	0.30(0.30)	1.00	23705.6	10200.00
25	19146.98	88.93	1.090	0.30(0.30)	1.00	24284.9	10300.00
26	19128.26	89.11	1.089	0.30(0.30)	1.00	24297.6	10320.00
27	18618.31	93.72	1.067	0.30(0.30)	1.00	24489.5	10210.00

28	16418.02	119.59	0.955	0.30(0.30)	1.00	25186.1	10100.00

TOTAL AREA(ACRES) = 25186.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 21454.35 Tc(MIN.) = 44.688
EFFECTIVE AREA(ACRES) = 15226.35 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25186.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 25186.1 TC(MIN.) = 44.69
EFFECTIVE AREA(ACRES) = 15226.35 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999
PEAK FLOW RATE(CFS) = 21454.35

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18271.49	26.89	1.937	0.30(0.30)	1.00	8025.2	11000.00
2	20528.79	37.71	1.593	0.30(0.30)	1.00	12254.2	11330.00
3	20786.00	39.21	1.550	0.30(0.30)	1.00	12878.7	10850.00
4	20891.66	39.94	1.529	0.30(0.30)	1.00	13187.6	11350.00
5	20911.18	40.08	1.526	0.30(0.30)	1.00	13246.6	10800.00
6	21179.27	41.89	1.497	0.30(0.30)	1.00	14067.5	10900.00
7	21317.19	43.14	1.476	0.30(0.30)	1.00	14598.3	11300.00
8	21433.15	44.35	1.457	0.30(0.30)	1.00	15096.6	11401.00
9	21454.10	44.68	1.452	0.30(0.30)	1.00	15224.3	11250.00
10	21454.35	44.69	1.452	0.30(0.30)	1.00	15226.4	11130.00
11	21451.83	44.99	1.447	0.30(0.30)	1.00	15329.1	10830.00
12	21450.57	45.02	1.446	0.30(0.30)	1.00	15338.6	10910.00
13	21414.84	45.44	1.439	0.30(0.30)	1.00	15459.5	11220.00
14	21394.48	46.01	1.430	0.30(0.30)	1.00	15616.5	10630.00
15	20974.20	56.97	1.313	0.30(0.30)	1.00	18795.6	10600.00
16	20929.62	61.46	1.280	0.30(0.30)	1.00	20113.9	11111.00
17	20945.89	62.29	1.274	0.30(0.30)	1.00	20339.9	11201.00
18	20942.10	62.69	1.271	0.30(0.30)	1.00	20436.0	11101.00
19	20917.86	63.60	1.265	0.30(0.30)	1.00	20640.2	10500.00
20	20810.29	67.83	1.236	0.30(0.30)	1.00	21523.6	10710.00
21	20714.83	69.76	1.223	0.30(0.30)	1.00	21855.7	10410.00
22	20331.12	74.26	1.192	0.30(0.30)	1.00	22516.7	10700.00
23	19773.12	80.98	1.145	0.30(0.30)	1.00	23435.8	10400.00
24	19635.68	83.23	1.130	0.30(0.30)	1.00	23705.6	10200.00
25	19146.98	88.93	1.090	0.30(0.30)	1.00	24284.9	10300.00
26	19128.26	89.11	1.089	0.30(0.30)	1.00	24297.6	10320.00
27	18618.31	93.72	1.067	0.30(0.30)	1.00	24489.5	10210.00
28	16418.02	119.59	0.955	0.30(0.30)	1.00	25186.1	10100.00

==========

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S15.DAT
  TIME/DATE OF STUDY: 10:07 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.850
   2)   10.00;  3.678
   3)   15.00;  2.780
   4)   20.00;  2.308
   5)   25.00;  1.981
   6)   30.00;  1.786
   7)   40.00;  1.505
   8)   50.00;  1.344
   9)   60.00;  1.258
  10)   90.00;  1.053
  11)  120.00;  0.923
  12)  180.00;  0.808
  13)  360.00;  0.611
  14) 1440.00;  0.272
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11500.00 TO NODE  11501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   352.85
  ELEVATION DATA: UPSTREAM(FEET) =   1891.25  DOWNSTREAM(FEET) =   1665.22

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.064
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.519
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.58      0.30     1.000      0    8.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.00
  TOTAL AREA(ACRES) =      1.58   PEAK FLOW RATE(CFS) =      6.00

****************************************************************************
  FLOW PROCESS FROM NODE  11501.00 TO NODE  11502.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1665.22  DOWNSTREAM(FEET) =   1423.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.67   CHANNEL SLOPE =  0.3849
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.771
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.84      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.07
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.72
  Tc(MIN.) =    9.79
  SUBAREA AREA(ACRES) =     6.84       SUBAREA RUNOFF(CFS) =   21.37
  EFFECTIVE AREA(ACRES) =      8.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.4          PEAK FLOW RATE(CFS) =      26.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   7.11
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11502.00 =     980.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11502.00 TO NODE  11503.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1423.64  DOWNSTREAM(FEET) =   1258.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   937.16   CHANNEL SLOPE =  0.1758
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.77
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.352
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.69
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   2.03
  Tc(MIN.) =   11.82
  SUBAREA AREA(ACRES) =    28.16       SUBAREA RUNOFF(CFS) =   77.35
  EFFECTIVE AREA(ACRES) =     36.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       36.6         PEAK FLOW RATE(CFS) =     100.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   8.90
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11503.00 =    1917.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11503.00 TO NODE  11504.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1258.86  DOWNSTREAM(FEET) =   1009.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.29   CHANNEL SLOPE =  0.1298
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.766
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     178.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.63
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   3.33
  Tc(MIN.) =   15.15
  SUBAREA AREA(ACRES) =    69.67       SUBAREA RUNOFF(CFS) =  154.64
  EFFECTIVE AREA(ACRES) =    106.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.2         PEAK FLOW RATE(CFS) =     235.83
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.68   FLOW VELOCITY(FEET/SEC.) =  10.54
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11504.00 =    3841.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1009.04  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2817.91   CHANNEL SLOPE =  0.1475
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.88
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.390
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       65.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     297.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.79
  AVERAGE FLOW DEPTH(FEET) =   1.84   TRAVEL TIME(MIN.) =   3.98
  Tc(MIN.) =   19.13
  SUBAREA AREA(ACRES) =    65.12       SUBAREA RUNOFF(CFS) =  122.50
  EFFECTIVE AREA(ACRES) =    171.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.4         PEAK FLOW RATE(CFS) =     322.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =  12.09
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S14.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    18271.49   26.89  0.30( 0.30) 1.00    8025.2   11000.00
```

```
      2    20528.79   37.71  0.30( 0.30) 1.00   12254.2   11330.00
      3    20911.18   40.08  0.30( 0.30) 1.00   13246.6   10800.00
      4    21179.27   41.89  0.30( 0.30) 1.00   14067.5   10900.00
      5    21317.19   43.14  0.30( 0.30) 1.00   14598.3   11300.00
      6    21454.35   44.69  0.30( 0.30) 1.00   15226.4   11130.00
      7    21414.84   45.44  0.30( 0.30) 1.00   15459.5   11220.00
      8    21394.48   46.01  0.30( 0.30) 1.00   15616.5   10630.00
      9    20974.20   56.97  0.30( 0.30) 1.00   18795.6   10600.00
     10    20929.62   61.46  0.30( 0.30) 1.00   20113.9   11111.00
     11    20945.89   62.29  0.30( 0.30) 1.00   20339.9   11201.00
     12    20917.86   63.60  0.30( 0.30) 1.00   20640.2   10500.00
     13    20810.29   67.83  0.30( 0.30) 1.00   21523.6   10710.00
     14    20714.83   69.76  0.30( 0.30) 1.00   21855.7   10410.00
     15    20331.12   74.26  0.30( 0.30) 1.00   22516.7   10700.00
     16    19773.12   80.98  0.30( 0.30) 1.00   23435.8   10400.00
     17    19635.68   83.23  0.30( 0.30) 1.00   23705.6   10200.00
     18    19146.98   88.93  0.30( 0.30) 1.00   24284.9   10300.00
     19    18618.31   93.72  0.30( 0.30) 1.00   24489.5   10210.00
     20    16418.02  119.59  0.30( 0.30) 1.00   25186.1   10100.00
   TOTAL AREA(ACRES) =    25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    18271.49   26.89  0.30( 0.30) 1.00    8025.2   11000.00
      2    20528.79   37.71  0.30( 0.30) 1.00   12254.2   11330.00
      3    20911.18   40.08  0.30( 0.30) 1.00   13246.6   10800.00
      4    21179.27   41.89  0.30( 0.30) 1.00   14067.5   10900.00
      5    21317.19   43.14  0.30( 0.30) 1.00   14598.3   11300.00
      6    21454.35   44.69  0.30( 0.30) 1.00   15226.4   11130.00
      7    21414.84   45.44  0.30( 0.30) 1.00   15459.5   11220.00
      8    21394.48   46.01  0.30( 0.30) 1.00   15616.5   10630.00
      9    20974.20   56.97  0.30( 0.30) 1.00   18795.6   10600.00
     10    20929.62   61.46  0.30( 0.30) 1.00   20113.9   11111.00
     11    20945.89   62.29  0.30( 0.30) 1.00   20339.9   11201.00
     12    20917.86   63.60  0.30( 0.30) 1.00   20640.2   10500.00
     13    20810.29   67.83  0.30( 0.30) 1.00   21523.6   10710.00
     14    20714.83   69.76  0.30( 0.30) 1.00   21855.7   10410.00
     15    20331.12   74.26  0.30( 0.30) 1.00   22516.7   10700.00
     16    19773.12   80.98  0.30( 0.30) 1.00   23435.8   10400.00
     17    19635.68   83.23  0.30( 0.30) 1.00   23705.6   10200.00
     18    19146.98   88.93  0.30( 0.30) 1.00   24284.9   10300.00
     19    18618.31   93.72  0.30( 0.30) 1.00   24489.5   10210.00
     20    16418.02  119.59  0.30( 0.30) 1.00   25186.1   10100.00
   TOTAL AREA(ACRES) =     25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    651.70  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2004.08   CHANNEL SLOPE =  0.0291
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  14.06
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.404
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   21481.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.17
  AVERAGE FLOW DEPTH(FEET) =  14.06   TRAVEL TIME(MIN.) =   1.58
  Tc(MIN.) =   46.27
  SUBAREA AREA(ACRES) =    54.88       SUBAREA RUNOFF(CFS) =   54.54
  EFFECTIVE AREA(ACRES) =  15281.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    25241.0          PEAK FLOW RATE(CFS) =   21454.35
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  14.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 14.05   FLOW VELOCITY(FEET/SEC.) =  21.17
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    18271.49   28.54    1.843  0.30( 0.30) 1.00    8080.1   11000.00
      2    20528.79   39.31    1.524  0.30( 0.30) 1.00   12309.0   11330.00
      3    20911.18   41.67    1.478  0.30( 0.30) 1.00   13301.5   10800.00
      4    21179.27   43.47    1.449  0.30( 0.30) 1.00   14122.4   10900.00
      5    21317.19   44.72    1.429  0.30( 0.30) 1.00   14653.2   11300.00
      6    21454.35   46.27    1.404  0.30( 0.30) 1.00   15281.2   11130.00
      7    21414.84   47.02    1.392  0.30( 0.30) 1.00   15514.4   11220.00
      8    21394.48   47.59    1.383  0.30( 0.30) 1.00   15671.4   10630.00
      9    20974.20   58.56    1.270  0.30( 0.30) 1.00   18850.4   10600.00
     10    20929.62   63.05    1.237  0.30( 0.30) 1.00   20168.7   11111.00
     11    20945.89   63.87    1.232  0.30( 0.30) 1.00   20394.7   11201.00
     12    20917.86   65.19    1.223  0.30( 0.30) 1.00   20695.1   10500.00
     13    20810.29   69.42    1.194  0.30( 0.30) 1.00   21578.5   10710.00
     14    20714.83   71.36    1.180  0.30( 0.30) 1.00   21910.6   10410.00
     15    20331.12   75.86    1.150  0.30( 0.30) 1.00   22571.6   10700.00
     16    19773.12   82.60    1.104  0.30( 0.30) 1.00   23490.7   10400.00
     17    19635.68   84.84    1.088  0.30( 0.30) 1.00   23760.5   10200.00
     18    19146.98   90.55    1.051  0.30( 0.30) 1.00   24339.8   10300.00
     19    18618.31   95.35    1.030  0.30( 0.30) 1.00   24544.4   10210.00
     20    16418.02  121.28    0.921  0.30( 0.30) 1.00   25241.0   10100.00
```

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	322.38	19.13	2.390	0.30(0.30)	1.00	171.4	11500.00

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16911.49	19.13	2.390	0.30(0.30)	1.00	5587.5	11500.00
2	18509.48	28.54	1.843	0.30(0.30)	1.00	8251.4	11000.00
3	20717.63	39.31	1.524	0.30(0.30)	1.00	12480.4	11330.00
4	21092.89	41.67	1.478	0.30(0.30)	1.00	13472.8	10800.00
5	21356.51	43.47	1.449	0.30(0.30)	1.00	14293.7	10900.00
6	21491.33	44.72	1.429	0.30(0.30)	1.00	14824.6	11300.00
7	21624.66	46.27	1.404	0.30(0.30)	1.00	15452.6	11130.00
8	21583.27	47.02	1.392	0.30(0.30)	1.00	15685.8	11220.00
9	21561.49	47.59	1.383	0.30(0.30)	1.00	15842.8	10630.00
10	21123.87	58.56	1.270	0.30(0.30)	1.00	19021.8	10600.00
11	21074.18	63.05	1.237	0.30(0.30)	1.00	20340.1	11111.00
12	21089.57	63.87	1.232	0.30(0.30)	1.00	20566.1	11201.00
13	21060.16	65.19	1.223	0.30(0.30)	1.00	20866.5	10500.00
14	20948.13	69.42	1.194	0.30(0.30)	1.00	21749.8	10710.00
15	20850.63	71.36	1.180	0.30(0.30)	1.00	22081.9	10410.00
16	20462.17	75.86	1.150	0.30(0.30)	1.00	22742.9	10700.00
17	19897.08	82.60	1.104	0.30(0.30)	1.00	23662.1	10400.00
18	19757.26	84.84	1.088	0.30(0.30)	1.00	23931.8	10200.00
19	19262.76	90.55	1.051	0.30(0.30)	1.00	24511.1	10300.00
20	18730.88	95.35	1.030	0.30(0.30)	1.00	24715.8	10210.00
21	16513.74	121.28	0.921	0.30(0.30)	1.00	25412.4	10100.00

TOTAL AREA(ACRES) = 25412.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 21624.66 Tc(MIN.) = 46.266
EFFECTIVE AREA(ACRES) = 15452.60 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25412.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

****
FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 593.37 DOWNSTREAM(FEET) = 577.77
CHANNEL LENGTH THRU SUBAREA(FEET) = 1515.75 CHANNEL SLOPE = 0.0103
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.30
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.377
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	100.60	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21673.41
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.91
AVERAGE FLOW DEPTH(FEET) = 10.30 TRAVEL TIME(MIN.) = 1.69
Tc(MIN.) = 47.96
SUBAREA AREA(ACRES) = 100.60 SUBAREA RUNOFF(CFS) = 97.50
EFFECTIVE AREA(ACRES) = 15553.20 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25513.0 PEAK FLOW RATE(CFS) = 21624.66
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.29 FLOW VELOCITY(FEET/SEC.) = 14.89
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

****
FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 47.96
RAINFALL INTENSITY(INCH/HR) = 1.38
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 15553.20
TOTAL STREAM AREA(ACRES) = 25512.96
PEAK FLOW RATE(CFS) AT CONFLUENCE = 21624.66

****
FLOW PROCESS FROM NODE 11530.00 TO NODE 11531.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========
INITIAL SUBAREA FLOW-LENGTH(FEET) = 278.68
ELEVATION DATA: UPSTREAM(FEET) = 1593.31 DOWNSTREAM(FEET) = 1523.14

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.844
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.180
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	1.18	0.30	1.000	0	8.84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 4.12
TOTAL AREA(ACRES) = 1.18 PEAK FLOW RATE(CFS) = 4.12

****
FLOW PROCESS FROM NODE 11531.00 TO NODE 11532.00 IS CODE = 56

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1523.14  DOWNSTREAM(FEET) =   1297.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =   698.37   CHANNEL SLOPE =  0.3230
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.517
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.32      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.67
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   2.05
  Tc(MIN.) =   10.90
  SUBAREA AREA(ACRES) =     8.32       SUBAREA RUNOFF(CFS) =   24.09
  EFFECTIVE AREA(ACRES) =      9.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.5         PEAK FLOW RATE(CFS) =      27.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =   6.90
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11532.00 =     977.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11532.00 TO NODE  11533.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1297.56  DOWNSTREAM(FEET) =   1134.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.17   CHANNEL SLOPE =  0.1693
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.67
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.104
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.99
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   2.30
  Tc(MIN.) =   13.19
  SUBAREA AREA(ACRES) =    18.50       SUBAREA RUNOFF(CFS) =   46.70
  EFFECTIVE AREA(ACRES) =     28.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.0         PEAK FLOW RATE(CFS) =      70.67
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   7.80
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11533.00 =    1939.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11533.00 TO NODE  11534.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1134.68  DOWNSTREAM(FEET) =   1002.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.78   CHANNEL SLOPE =  0.1379
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.816
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     182.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.92
  AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   1.61
  Tc(MIN.) =   14.80
  SUBAREA AREA(ACRES) =    98.44       SUBAREA RUNOFF(CFS) =  222.90
  EFFECTIVE AREA(ACRES) =    126.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      126.4         PEAK FLOW RATE(CFS) =     286.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.84   FLOW VELOCITY(FEET/SEC.) =  11.41
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11534.00 =    2896.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11534.00 TO NODE  11535.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1002.72  DOWNSTREAM(FEET) =    816.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2160.78   CHANNEL SLOPE =  0.0863
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.63
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.484
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.87      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     419.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.79
  AVERAGE FLOW DEPTH(FEET) =   2.57   TRAVEL TIME(MIN.) =   3.34
  Tc(MIN.) =   18.14
  SUBAREA AREA(ACRES) =   134.87       SUBAREA RUNOFF(CFS) =  265.09
  EFFECTIVE AREA(ACRES) =    261.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      261.3         PEAK FLOW RATE(CFS) =     513.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.86   FLOW VELOCITY(FEET/SEC.) =  11.44
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11535.00 =    5056.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    816.20  DOWNSTREAM(FEET) =    577.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3109.20   CHANNEL SLOPE =  0.0767
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.17
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.131
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     578.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.35
  AVERAGE FLOW DEPTH(FEET) =   3.13   TRAVEL TIME(MIN.) =   4.57
  Tc(MIN.) =   22.71
  SUBAREA AREA(ACRES) =    78.24       SUBAREA RUNOFF(CFS) =  128.94
  EFFECTIVE AREA(ACRES) =    339.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      339.5         PEAK FLOW RATE(CFS) =     559.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.09   FLOW VELOCITY(FEET/SEC.) =  11.22
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11540.00 =    8165.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```



```
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   22.71
RAINFALL INTENSITY(INCH/HR) =   2.13
AREA-AVERAGED Fm(INCH/HR) =  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30
AREA-AVERAGED Ap =  1.00
EFFECTIVE STREAM AREA(ACRES) =     339.55
TOTAL STREAM AREA(ACRES) =     339.55
PEAK FLOW RATE(CFS) AT CONFLUENCE =     559.59

** CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1    16911.49   20.95    2.246  0.30( 0.30) 1.00    5688.1   11500.00
    1    18509.48   30.31    1.777  0.30( 0.30) 1.00    8352.0   11000.00
    1    20717.63   41.03    1.488  0.30( 0.30) 1.00   12581.0   11330.00
    1    21092.89   43.38    1.451  0.30( 0.30) 1.00   13573.4   10800.00
    1    21356.51   45.17    1.422  0.30( 0.30) 1.00   14394.3   10900.00
    1    21491.33   46.42    1.402  0.30( 0.30) 1.00   14925.2   11300.00
    1    21624.66   47.96    1.377  0.30( 0.30) 1.00   15553.2   11130.00
    1    21583.27   48.72    1.365  0.30( 0.30) 1.00   15786.4   11220.00
    1    21561.49   49.29    1.355  0.30( 0.30) 1.00   15943.4   10630.00
    1    21123.87   60.27    1.256  0.30( 0.30) 1.00   19122.4   10600.00
    1    21074.18   64.76    1.225  0.30( 0.30) 1.00   20440.7   11111.00
    1    21089.57   65.58    1.220  0.30( 0.30) 1.00   20666.7   11201.00
    1    21060.16   66.90    1.211  0.30( 0.30) 1.00   20967.1   10500.00
    1    20948.13   71.13    1.182  0.30( 0.30) 1.00   21850.4   10710.00
    1    20850.63   73.07    1.169  0.30( 0.30) 1.00   22182.5   10410.00
    1    20462.17   77.59    1.138  0.30( 0.30) 1.00   22843.5   10700.00
    1    19897.08   84.33    1.092  0.30( 0.30) 1.00   23762.7   10400.00
    1    19757.26   86.59    1.076  0.30( 0.30) 1.00   24032.4   10200.00
    1    19262.76   92.31    1.043  0.30( 0.30) 1.00   24611.7   10300.00
    1    18730.88   97.12    1.022  0.30( 0.30) 1.00   24816.4   10210.00
    1    16513.74  123.12    0.917  0.30( 0.30) 1.00   25513.0   10100.00
    2      559.59   22.71    2.131  0.30( 0.30) 1.00     339.5   11530.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1    17460.22   20.95    2.246  0.30( 0.30) 1.00    6001.4   11500.00
    2    17769.99   22.71    2.131  0.30( 0.30) 1.00    6525.9   11530.00
    3    18960.92   30.31    1.777  0.30( 0.30) 1.00    8691.6   11000.00
    4    21080.84   41.03    1.488  0.30( 0.30) 1.00   12920.6   11330.00
    5    21444.52   43.38    1.451  0.30( 0.30) 1.00   13913.0   10800.00
    6    21699.33   45.17    1.422  0.30( 0.30) 1.00   14733.9   10900.00
    7    21828.00   46.42    1.402  0.30( 0.30) 1.00   15264.7   11300.00
    8    21953.75   47.96    1.377  0.30( 0.30) 1.00   15892.8   11130.00
    9    21908.65   48.72    1.365  0.30( 0.30) 1.00   16125.9   11220.00
   10    21884.07   49.29    1.355  0.30( 0.30) 1.00   16282.9   10630.00
   11    21416.09   60.27    1.256  0.30( 0.30) 1.00   19462.0   10600.00
   12    21357.03   64.76    1.225  0.30( 0.30) 1.00   20780.3   11111.00
   13    21370.69   65.58    1.220  0.30( 0.30) 1.00   21006.3   11201.00
   14    21338.53   66.90    1.211  0.30( 0.30) 1.00   21306.6   10500.00
   15    21217.68   71.13    1.182  0.30( 0.30) 1.00   22190.0   10710.00
```

```
    16    21116.12   73.07    1.169  0.30( 0.30) 1.00   22522.1   10410.00
    17    20718.23   77.59    1.138  0.30( 0.30) 1.00   23183.1   10700.00
    18    20139.05   84.33    1.092  0.30( 0.30) 1.00   24102.2   10400.00
    19    19994.53   86.59    1.076  0.30( 0.30) 1.00   24372.0   10200.00
    20    19489.84   92.31    1.043  0.30( 0.30) 1.00   24951.3   10300.00
    21    18951.58   97.12    1.022  0.30( 0.30) 1.00   25155.9   10210.00
    22    16702.32  123.12    0.917  0.30( 0.30) 1.00   25852.5   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   21953.75    Tc(MIN.) =    47.96
  EFFECTIVE AREA(ACRES) =   15892.75   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    25852.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11540.00 =   74743.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11540.00 TO NODE  11541.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    577.77  DOWNSTREAM(FEET) =    556.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.36   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.41
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.342
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      389.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22136.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.06
  AVERAGE FLOW DEPTH(FEET) =  10.39   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   50.23
  SUBAREA AREA(ACRES) =   389.46       SUBAREA RUNOFF(CFS) =  365.26
  EFFECTIVE AREA(ACRES) =  16282.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26242.0         PEAK FLOW RATE(CFS) =   21953.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.34   FLOW VELOCITY(FEET/SEC.) =  15.02
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11541.00 =   76797.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11541.00 TO NODE  11542.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.39  DOWNSTREAM(FEET) =    523.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3267.94   CHANNEL SLOPE =  0.0101
```



```
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.47
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.311
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      330.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22103.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.91
  AVERAGE FLOW DEPTH(FEET) =  10.46   TRAVEL TIME(MIN.) =   3.65
  Tc(MIN.) =   53.89
  SUBAREA AREA(ACRES) =   330.30       SUBAREA RUNOFF(CFS) =  300.43
  EFFECTIVE AREA(ACRES) =  16612.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26572.3         PEAK FLOW RATE(CFS) =   21953.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.42   FLOW VELOCITY(FEET/SEC.) =  14.88
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11542.00 =   80065.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11542.00 TO NODE  11543.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    523.29  DOWNSTREAM(FEET) =    493.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2857.94   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.39
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.283
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      285.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22079.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.03
  AVERAGE FLOW DEPTH(FEET) =  10.38   TRAVEL TIME(MIN.) =   3.17
  Tc(MIN.) =   57.06
  SUBAREA AREA(ACRES) =   285.11       SUBAREA RUNOFF(CFS) =  252.34
  EFFECTIVE AREA(ACRES) =  16897.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26857.4         PEAK FLOW RATE(CFS) =   21953.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.35
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.35   FLOW VELOCITY(FEET/SEC.) =  15.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11543.00 =   82923.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11543.00 TO NODE  11544.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    493.61  DOWNSTREAM(FEET) =    480.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.01   CHANNEL SLOPE =  0.0068
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.64
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.262
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      303.63      0.30     0.987     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.987
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22085.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.98
  AVERAGE FLOW DEPTH(FEET) =  11.62   TRAVEL TIME(MIN.) =   2.52
  Tc(MIN.) =   59.58
  SUBAREA AREA(ACRES) =   303.63       SUBAREA RUNOFF(CFS) =  263.87
  EFFECTIVE AREA(ACRES) =  17201.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27161.0         PEAK FLOW RATE(CFS) =   21953.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.58   FLOW VELOCITY(FEET/SEC.) =  12.95
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11544.00 =   84886.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11544.00 TO NODE  11545.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    480.21  DOWNSTREAM(FEET) =    456.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1914.49   CHANNEL SLOPE =  0.0122
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.94
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.247
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      184.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22032.25
```



```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.88
  AVERAGE FLOW DEPTH(FEET) =   9.93   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =   61.58
  SUBAREA AREA(ACRES) =   184.16       SUBAREA RUNOFF(CFS) =  157.00
  EFFECTIVE AREA(ACRES) =  17385.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27345.2         PEAK FLOW RATE(CFS) =   21953.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.91   FLOW VELOCITY(FEET/SEC.) =  15.87
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11545.00 =   86800.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    456.90  DOWNSTREAM(FEET) =    436.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2322.79   CHANNEL SLOPE =  0.0089
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.81
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.229
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.95      0.30     0.844     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.844
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22020.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.24
  AVERAGE FLOW DEPTH(FEET) =  10.80   TRAVEL TIME(MIN.) =   2.72
  Tc(MIN.) =   64.30
  SUBAREA AREA(ACRES) =   151.95       SUBAREA RUNOFF(CFS) =  133.40
  EFFECTIVE AREA(ACRES) =  17537.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27497.1         PEAK FLOW RATE(CFS) =   21953.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.78   FLOW VELOCITY(FEET/SEC.) =  14.22
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    27497.1  TC(MIN.) =     64.30
  EFFECTIVE AREA(ACRES) =  17537.36  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.997
  PEAK FLOW RATE(CFS)   =   21953.75

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17460.22	38.44	1.549	0.30(0.30)	1.00	7646.0	11500.00
2	17769.99	40.10	1.503	0.30(0.30)	1.00	8170.5	11530.00
3	18960.92	47.38	1.386	0.30(0.30)	1.00	10336.2	11000.00
4	21080.84	57.57	1.279	0.30(0.30)	1.00	14565.2	11330.00
5	21444.52	59.84	1.259	0.30(0.30)	1.00	15557.6	10800.00
6	21699.33	61.57	1.247	0.30(0.30)	1.00	16378.5	10900.00
7	21828.00	62.79	1.239	0.30(0.30)	1.00	16909.3	11300.00
8	21953.75	64.30	1.229	0.30(0.30)	1.00	17537.4	11130.00
9	21908.65	65.07	1.223	0.30(0.30)	1.00	17770.5	11220.00
10	21884.07	65.64	1.219	0.30(0.30)	1.00	17927.5	10630.00
11	21416.09	76.73	1.144	0.30(0.30)	1.00	21106.6	10600.00
12	21357.03	81.24	1.113	0.30(0.30)	1.00	22424.9	11111.00
13	21370.69	82.06	1.107	0.30(0.30)	1.00	22650.9	11201.00
14	21338.53	83.38	1.098	0.30(0.30)	1.00	22951.3	10500.00
15	21217.68	87.64	1.069	0.30(0.30)	1.00	23834.6	10710.00
16	21116.12	89.61	1.056	0.30(0.30)	1.00	24166.7	10410.00
17	20718.23	94.22	1.035	0.30(0.30)	1.00	24827.7	10700.00
18	20139.05	101.11	1.005	0.30(0.30)	1.00	25746.8	10400.00
19	19994.53	103.40	0.995	0.30(0.30)	1.00	26016.6	10200.00
20	19489.84	109.25	0.970	0.30(0.30)	1.00	26595.9	10300.00
21	18951.58	114.21	0.948	0.30(0.30)	1.00	26800.5	10210.00
22	16702.32	140.88	0.883	0.30(0.30)	1.00	27497.1	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S16.DAT
  TIME/DATE OF STUDY: 10:07 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.850
   2)   10.00;  3.678
   3)   15.00;  2.780
   4)   20.00;  2.308
   5)   25.00;  1.981
   6)   30.00;  1.786
   7)   40.00;  1.505
   8)   50.00;  1.344
   9)   60.00;  1.258
  10)   90.00;  1.053
  11)  120.00;  0.923
  12)  180.00;  0.808
  13)  360.00;  0.611
  14) 1440.00;  0.272
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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```
**************************************************************************
  FLOW PROCESS FROM NODE  11600.00 TO NODE  11601.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.21
  ELEVATION DATA: UPSTREAM(FEET) =   3061.08  DOWNSTREAM(FEET) =   2962.88

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.120
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.657
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.79      0.30     1.000     0   10.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.41
  TOTAL AREA(ACRES) =      1.79   PEAK FLOW RATE(CFS) =      5.41

**************************************************************************
  FLOW PROCESS FROM NODE  11601.00 TO NODE  11602.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.88  DOWNSTREAM(FEET) =   2839.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =   548.33   CHANNEL SLOPE =  0.2252
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.291
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.48
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   2.04
  Tc(MIN.) =   12.16
  SUBAREA AREA(ACRES) =     4.88       SUBAREA RUNOFF(CFS) =   13.13
  EFFECTIVE AREA(ACRES) =      6.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =      17.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   5.22
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11602.00 =     938.54 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11602.00 TO NODE  11603.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2839.39  DOWNSTREAM(FEET) =   2697.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.87   CHANNEL SLOPE =  0.1452
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.858
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.76
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.41
  Tc(MIN.) =   14.57
  SUBAREA AREA(ACRES) =    31.42       SUBAREA RUNOFF(CFS) =   72.34
  EFFECTIVE AREA(ACRES) =     38.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.1         PEAK FLOW RATE(CFS) =      87.69
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   7.97
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11603.00 =    1915.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11603.00 TO NODE  11604.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2697.55  DOWNSTREAM(FEET) =   2598.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1887.15   CHANNEL SLOPE =  0.0523
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.382
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.03      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     155.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.76
  AVERAGE FLOW DEPTH(FEET) =   1.71   TRAVEL TIME(MIN.) =   4.65
  Tc(MIN.) =   19.22
  SUBAREA AREA(ACRES) =    72.03       SUBAREA RUNOFF(CFS) =  134.96
  EFFECTIVE AREA(ACRES) =    110.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =     206.33
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.00   FLOW VELOCITY(FEET/SEC.) =   7.35
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11604.00 =    3802.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11604.00 TO NODE  11605.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2598.90  DOWNSTREAM(FEET) =   2464.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2488.89   CHANNEL SLOPE =  0.0541
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.42
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.027
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     281.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.16
  AVERAGE FLOW DEPTH(FEET) =   2.35   TRAVEL TIME(MIN.) =   5.08
  Tc(MIN.) =   24.30
  SUBAREA AREA(ACRES) =    96.28       SUBAREA RUNOFF(CFS) =  149.61
  EFFECTIVE AREA(ACRES) =    206.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.4         PEAK FLOW RATE(CFS) =     320.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.52   FLOW VELOCITY(FEET/SEC.) =   8.46
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11605.00 =    6291.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11605.00 TO NODE  11606.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.25  DOWNSTREAM(FEET) =   2359.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1936.71   CHANNEL SLOPE =  0.0538
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.28
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.877
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      266.26      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     509.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.62
  AVERAGE FLOW DEPTH(FEET) =   3.22   TRAVEL TIME(MIN.) =   3.35
  Tc(MIN.) =   27.66
  SUBAREA AREA(ACRES) =   266.26       SUBAREA RUNOFF(CFS) =  378.00
  EFFECTIVE AREA(ACRES) =    472.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      472.7          PEAK FLOW RATE(CFS) =     671.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.71   FLOW VELOCITY(FEET/SEC.) =  10.38
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11606.00 =    8228.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11606.00 TO NODE  11607.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2359.99  DOWNSTREAM(FEET) =   1905.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3829.49   CHANNEL SLOPE =  0.1188
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.24
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.726
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     756.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.30
  AVERAGE FLOW DEPTH(FEET) =   3.22   TRAVEL TIME(MIN.) =   4.46
  Tc(MIN.) =   32.12
  SUBAREA AREA(ACRES) =   132.44       SUBAREA RUNOFF(CFS) =  170.03
  EFFECTIVE AREA(ACRES) =    605.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      605.1          PEAK FLOW RATE(CFS) =     776.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.26   FLOW VELOCITY(FEET/SEC.) =  14.41
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11607.00 =   12057.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11607.00 TO NODE  11608.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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```
  ELEVATION DATA: UPSTREAM(FEET) =   1905.15  DOWNSTREAM(FEET) =   1717.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1095.02   CHANNEL SLOPE =  0.1710
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.06
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.696
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       76.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     825.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.71
  AVERAGE FLOW DEPTH(FEET) =   3.06   TRAVEL TIME(MIN.) =   1.09
  Tc(MIN.) =   33.21
  SUBAREA AREA(ACRES) =    76.91       SUBAREA RUNOFF(CFS) =   96.62
  EFFECTIVE AREA(ACRES) =    682.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      682.0          PEAK FLOW RATE(CFS) =     856.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.12   FLOW VELOCITY(FEET/SEC.) =  16.88
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11608.00 =   13152.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11608.00 TO NODE  11609.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1717.92  DOWNSTREAM(FEET) =   1516.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1480.24   CHANNEL SLOPE =  0.1362
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.70
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.654
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1057.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.48
  AVERAGE FLOW DEPTH(FEET) =   3.69   TRAVEL TIME(MIN.) =   1.50
  Tc(MIN.) =   34.71
  SUBAREA AREA(ACRES) =   328.91       SUBAREA RUNOFF(CFS) =  400.73
  EFFECTIVE AREA(ACRES) =   1010.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1010.9          PEAK FLOW RATE(CFS) =    1231.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.99
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.99   FLOW VELOCITY(FEET/SEC.) =  17.19
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11609.00 =   14632.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11609.00 TO NODE  11610.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1516.24  DOWNSTREAM(FEET) =   1332.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.38   CHANNEL SLOPE =  0.0957
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.73
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.596
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      355.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1438.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.73
  AVERAGE FLOW DEPTH(FEET) =   4.71   TRAVEL TIME(MIN.) =   2.04
  Tc(MIN.) =   36.75
  SUBAREA AREA(ACRES) =   355.16       SUBAREA RUNOFF(CFS) =  414.39
  EFFECTIVE AREA(ACRES) =   1366.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1366.1         PEAK FLOW RATE(CFS) =    1593.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.95   FLOW VELOCITY(FEET/SEC.) =  16.16
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11610.00 =   16558.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11610.00 TO NODE  11611.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1332.01  DOWNSTREAM(FEET) =   1105.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2901.03   CHANNEL SLOPE =  0.0781
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.41
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.508
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      234.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1721.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.31
```



```
  AVERAGE FLOW DEPTH(FEET) =   5.40   TRAVEL TIME(MIN.) =   3.16
  Tc(MIN.) =   39.91
  SUBAREA AREA(ACRES) =   234.59       SUBAREA RUNOFF(CFS) =  254.97
  EFFECTIVE AREA(ACRES) =   1600.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1600.7         PEAK FLOW RATE(CFS) =    1739.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.43   FLOW VELOCITY(FEET/SEC.) =  15.36
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11611.00 =   19459.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11611.00 TO NODE  11612.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.34  DOWNSTREAM(FEET) =   1030.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1982.46   CHANNEL SLOPE =  0.0378
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.66
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.462
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1850.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.93
  AVERAGE FLOW DEPTH(FEET) =   6.66   TRAVEL TIME(MIN.) =   2.77
  Tc(MIN.) =   42.68
  SUBAREA AREA(ACRES) =   212.67       SUBAREA RUNOFF(CFS) =  222.40
  EFFECTIVE AREA(ACRES) =   1813.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1813.3         PEAK FLOW RATE(CFS) =    1896.32
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.73   FLOW VELOCITY(FEET/SEC.) =  12.01
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11612.00 =   21441.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.47  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3051.86   CHANNEL SLOPE =  0.0525
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.59
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.403
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      465.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2127.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.98
  AVERAGE FLOW DEPTH(FEET) =   6.57   TRAVEL TIME(MIN.) =   3.64
  Tc(MIN.) =   46.32
  SUBAREA AREA(ACRES) =   465.36       SUBAREA RUNOFF(CFS) =  462.12
  EFFECTIVE AREA(ACRES) =   2278.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2278.7         PEAK FLOW RATE(CFS) =    2262.85
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.77   FLOW VELOCITY(FEET/SEC.) =  14.20
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   46.32
  RAINFALL INTENSITY(INCH/HR) =   1.40
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2278.70
  TOTAL STREAM AREA(ACRES) =    2278.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2262.85

****************************************************************************
  FLOW PROCESS FROM NODE  11620.00 TO NODE  11621.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   266.64
  ELEVATION DATA: UPSTREAM(FEET) =   2567.03  DOWNSTREAM(FEET) =   2486.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.387
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.379
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        0.69      0.30     1.000     0    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.53
  TOTAL AREA(ACRES) =      0.69   PEAK FLOW RATE(CFS) =      2.53

****************************************************************************
  FLOW PROCESS FROM NODE  11621.00 TO NODE  11622.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2486.90  DOWNSTREAM(FEET) =   2424.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   712.48   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.212
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.82
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   4.21
  Tc(MIN.) =   12.59
  SUBAREA AREA(ACRES) =     3.63       SUBAREA RUNOFF(CFS) =    9.51
  EFFECTIVE AREA(ACRES) =      4.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.3         PEAK FLOW RATE(CFS) =      11.32
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   3.29
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11622.00 =     979.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11622.00 TO NODE  11623.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2424.91  DOWNSTREAM(FEET) =   2351.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.46   CHANNEL SLOPE =  0.0751
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.59
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.642
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.21
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  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   3.87
  Tc(MIN.) =   16.46
  SUBAREA AREA(ACRES) =    13.42       SUBAREA RUNOFF(CFS) =   28.29
  EFFECTIVE AREA(ACRES) =     17.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.7         PEAK FLOW RATE(CFS) =      37.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.68   FLOW VELOCITY(FEET/SEC.) =   4.81
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11623.00 =    1956.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11623.00 TO NODE  11624.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2351.48  DOWNSTREAM(FEET) =   2317.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.96   CHANNEL SLOPE =  0.0355
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.293
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.18
  AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   3.78
  Tc(MIN.) =   20.24
  SUBAREA AREA(ACRES) =    16.02       SUBAREA RUNOFF(CFS) =   28.73
  EFFECTIVE AREA(ACRES) =     33.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.8         PEAK FLOW RATE(CFS) =      60.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   4.40
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.00 =    2904.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.00 TO NODE  11624.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2317.87  DOWNSTREAM(FEET) =   2292.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   758.23   CHANNEL SLOPE =  0.0337
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



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  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.43
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.123
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.93      0.30     0.984     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      87.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.86
  AVERAGE FLOW DEPTH(FEET) =   1.41   TRAVEL TIME(MIN.) =   2.60
  Tc(MIN.) =   22.84
  SUBAREA AREA(ACRES) =    32.93       SUBAREA RUNOFF(CFS) =   54.16
  EFFECTIVE AREA(ACRES) =     66.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =     109.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.59   FLOW VELOCITY(FEET/SEC.) =   5.22
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.50 =    3662.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.50 TO NODE  11625.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2292.33  DOWNSTREAM(FEET) =   2256.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1098.98   CHANNEL SLOPE =  0.0325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.91
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.938
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       48.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     145.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.60
  AVERAGE FLOW DEPTH(FEET) =   1.88   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   26.11
  SUBAREA AREA(ACRES) =    48.16       SUBAREA RUNOFF(CFS) =   71.00
  EFFECTIVE AREA(ACRES) =    114.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.9         PEAK FLOW RATE(CFS) =     169.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.05   FLOW VELOCITY(FEET/SEC.) =   5.87
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11625.00 =    4761.75 FEET.
```

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****************************************************************************
  FLOW PROCESS FROM NODE  11625.00 TO NODE  11626.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2256.59  DOWNSTREAM(FEET) =   2104.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.93   CHANNEL SLOPE =  0.0739
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.34
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.795
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.15      0.30     0.950     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.950
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     313.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.39
  AVERAGE FLOW DEPTH(FEET) =   2.29   TRAVEL TIME(MIN.) =   3.65
  Tc(MIN.) =   29.76
  SUBAREA AREA(ACRES) =   212.15       SUBAREA RUNOFF(CFS) =  288.42
  EFFECTIVE AREA(ACRES) =    327.00     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      327.0         PEAK FLOW RATE(CFS) =     443.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.75   FLOW VELOCITY(FEET/SEC.) =  10.39
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11626.00 =    6818.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11626.00 TO NODE  11627.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2104.66  DOWNSTREAM(FEET) =   1837.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2716.08   CHANNEL SLOPE =  0.0985
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.84
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.688
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     535.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.14
  AVERAGE FLOW DEPTH(FEET) =   2.82   TRAVEL TIME(MIN.) =   3.73
  Tc(MIN.) =   33.49
  SUBAREA AREA(ACRES) =   147.74       SUBAREA RUNOFF(CFS) =  184.57
  EFFECTIVE AREA(ACRES) =    474.74     AREA-AVERAGED Fm(INCH/HR) =   0.29
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  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      474.7         PEAK FLOW RATE(CFS) =     596.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.99   FLOW VELOCITY(FEET/SEC.) =  12.50
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11627.00 =    9534.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11627.00 TO NODE  11628.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1837.03  DOWNSTREAM(FEET) =   1393.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2077.86   CHANNEL SLOPE =  0.2132
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.70
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.632
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      202.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     717.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.41
  AVERAGE FLOW DEPTH(FEET) =   2.68   TRAVEL TIME(MIN.) =   1.99
  Tc(MIN.) =   35.47
  SUBAREA AREA(ACRES) =   202.44       SUBAREA RUNOFF(CFS) =  242.73
  EFFECTIVE AREA(ACRES) =    677.18     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      677.2         PEAK FLOW RATE(CFS) =     814.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.87   FLOW VELOCITY(FEET/SEC.) =  18.03
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11628.00 =   11612.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11628.00 TO NODE  11629.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1393.93  DOWNSTREAM(FEET) =   1201.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2844.34   CHANNEL SLOPE =  0.0676
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.06
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.523
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      141.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     892.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.20
  AVERAGE FLOW DEPTH(FEET) =   4.05   TRAVEL TIME(MIN.) =   3.89
  Tc(MIN.) =   39.36
  SUBAREA AREA(ACRES) =   141.55       SUBAREA RUNOFF(CFS) =  155.80
  EFFECTIVE AREA(ACRES) =    818.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      818.7         PEAK FLOW RATE(CFS) =     904.18
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.07   FLOW VELOCITY(FEET/SEC.) =  12.24
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11629.00 =   14456.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1201.61  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3807.89   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.94
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.440
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      106.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     958.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.64
  AVERAGE FLOW DEPTH(FEET) =   3.93   TRAVEL TIME(MIN.) =   4.65
  Tc(MIN.) =   44.01
  SUBAREA AREA(ACRES) =   106.41       SUBAREA RUNOFF(CFS) =  109.22
  EFFECTIVE AREA(ACRES) =    925.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      925.1         PEAK FLOW RATE(CFS) =     952.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.92   FLOW VELOCITY(FEET/SEC.) =  13.60
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11630.00 =   18264.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   44.01
  RAINFALL INTENSITY(INCH/HR) =   1.44
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     925.14
  TOTAL STREAM AREA(ACRES) =     925.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     952.56

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2262.85   46.32    1.403  0.30( 0.30) 1.00    2278.7   11600.00
      2      952.56   44.01    1.440  0.30( 0.30) 0.99     925.1   11620.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3175.18   44.01    1.440  0.30( 0.30) 1.00    3090.6   11620.00
      2     3184.56   46.32    1.403  0.30( 0.30) 1.00    3203.8   11600.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    3184.56    Tc(MIN.) =    46.32
  EFFECTIVE AREA(ACRES) =    3203.84   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3203.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3203.8  TC(MIN.) =     46.32
  EFFECTIVE AREA(ACRES) =   3203.84  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.997
  PEAK FLOW RATE(CFS)   =    3184.56

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3175.18   44.01    1.440  0.30( 0.30) 1.00    3090.6   11620.00
      2     3184.56   46.32    1.403  0.30( 0.30) 1.00    3203.8   11600.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S17.DAT
  TIME/DATE OF STUDY: 10:07 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.850
   2)   10.00;  3.678
   3)   15.00;  2.780
   4)   20.00;  2.308
   5)   25.00;  1.981
   6)   30.00;  1.786
   7)   40.00;  1.505
   8)   50.00;  1.344
   9)   60.00;  1.258
  10)   90.00;  1.053
  11)  120.00;  0.923
  12)  180.00;  0.808
  13)  360.00;  0.611
  14) 1440.00;  0.272
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11701.00 TO NODE  11702.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   291.79
  ELEVATION DATA: UPSTREAM(FEET) =   1581.05  DOWNSTREAM(FEET) =   1496.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.753
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.220
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.72      0.30     1.000     0    8.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.60
  TOTAL AREA(ACRES) =      2.72   PEAK FLOW RATE(CFS) =      9.60

************************************************************************
  FLOW PROCESS FROM NODE  11702.00 TO NODE  11703.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1496.25  DOWNSTREAM(FEET) =   1254.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   563.54   CHANNEL SLOPE =  0.4293
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.34
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.670
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.26
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.29
  Tc(MIN.) =   10.05
  SUBAREA AREA(ACRES) =    10.12       SUBAREA RUNOFF(CFS) =   30.69
  EFFECTIVE AREA(ACRES) =     12.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.8          PEAK FLOW RATE(CFS) =      38.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   8.50
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11703.00 =     855.33 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11703.00 TO NODE  11704.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1254.33  DOWNSTREAM(FEET) =   1143.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.91   CHANNEL SLOPE =  0.1076
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.204
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      67.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.60
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   2.59
  Tc(MIN.) =   12.64
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   56.26
  EFFECTIVE AREA(ACRES) =     34.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.4         PEAK FLOW RATE(CFS) =      89.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   7.27
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11704.00 =    1881.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11704.00 TO NODE  11705.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1143.91  DOWNSTREAM(FEET) =    804.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1952.20   CHANNEL SLOPE =  0.1737
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.22
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.695
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     144.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.96
  AVERAGE FLOW DEPTH(FEET) =   1.17   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   15.90
  SUBAREA AREA(ACRES) =    50.19       SUBAREA RUNOFF(CFS) =  108.17
  EFFECTIVE AREA(ACRES) =     84.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       84.6         PEAK FLOW RATE(CFS) =     182.23
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.34   FLOW VELOCITY(FEET/SEC.) =  10.74
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11705.00 =    3833.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    804.90  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1056.71   CHANNEL SLOPE =  0.0753
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.493
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     197.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   1.77   TRAVEL TIME(MIN.) =   2.14
  Tc(MIN.) =   18.04
  SUBAREA AREA(ACRES) =    15.89       SUBAREA RUNOFF(CFS) =   31.36
  EFFECTIVE AREA(ACRES) =    100.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.4         PEAK FLOW RATE(CFS) =     198.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =   8.25
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S16.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     3175.18   44.01  0.30( 0.30) 1.00    3090.6   11620.00
```

```
      2     3184.56   46.32  0.30( 0.30) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =     3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     3175.18   44.01  0.30( 0.30) 1.00    3090.6   11620.00
      2     3184.56   46.32  0.30( 0.30) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =      3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.22  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3507.54   CHANNEL SLOPE =  0.0413
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.52
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.340
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      213.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3284.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.29
  AVERAGE FLOW DEPTH(FEET) =   8.51   TRAVEL TIME(MIN.) =   4.09
  Tc(MIN.) =   50.41
  SUBAREA AREA(ACRES) =   213.50       SUBAREA RUNOFF(CFS) =  199.94
  EFFECTIVE AREA(ACRES) =   3417.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3417.3         PEAK FLOW RATE(CFS) =    3203.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.41   FLOW VELOCITY(FEET/SEC.) =  14.20
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3198.31   48.11    1.374  0.30( 0.30) 1.00    3304.1   11620.00
      2     3203.35   50.41    1.340  0.30( 0.30) 1.00    3417.3   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      198.24   18.04    2.493  0.30( 0.30) 1.00     100.4   11701.00
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2644.90   18.04    2.493  0.30( 0.30) 1.00    1339.5   11701.00
      2     3295.45   48.11    1.374  0.30( 0.30) 1.00    3404.6   11620.00
      3     3297.41   50.41    1.340  0.30( 0.30) 1.00    3517.8   11600.00
    TOTAL AREA(ACRES) =      3517.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3297.41  Tc(MIN.) =   50.408
  EFFECTIVE AREA(ACRES) =   3517.78  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3517.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11721.00 TO NODE  11722.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    725.34  DOWNSTREAM(FEET) =    657.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1845.27   CHANNEL SLOPE =  0.0367
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.17
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.313
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      185.10      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3381.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.49
  AVERAGE FLOW DEPTH(FEET) =   3.16   TRAVEL TIME(MIN.) =   3.24
  Tc(MIN.) =   53.65
  SUBAREA AREA(ACRES) =   185.10       SUBAREA RUNOFF(CFS) =  168.70
  EFFECTIVE AREA(ACRES) =   3702.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3702.9         PEAK FLOW RATE(CFS) =    3377.88
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.16   FLOW VELOCITY(FEET/SEC.) =   9.48
```

```
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11722.00 =   29846.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11722.00 TO NODE  11723.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    657.70  DOWNSTREAM(FEET) =    609.57
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1967.44   CHANNEL SLOPE =  0.0245
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.63
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.279
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      273.16      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3498.24
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.42
 AVERAGE FLOW DEPTH(FEET) =   3.63   TRAVEL TIME(MIN.) =   3.90
 Tc(MIN.) =   57.54
 SUBAREA AREA(ACRES) =   273.16       SUBAREA RUNOFF(CFS) =  240.73
 EFFECTIVE AREA(ACRES) =   3976.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3976.0         PEAK FLOW RATE(CFS) =    3506.97
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.64

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.64   FLOW VELOCITY(FEET/SEC.) =   8.42
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11723.00 =   31813.89 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11723.00 TO NODE  11724.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    609.57  DOWNSTREAM(FEET) =    546.77
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2808.53   CHANNEL SLOPE =  0.0224
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.77
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.236
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      159.72      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3574.24
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.23
 AVERAGE FLOW DEPTH(FEET) =   3.77   TRAVEL TIME(MIN.) =   5.69
 Tc(MIN.) =   63.23
```



```
 SUBAREA AREA(ACRES) =   159.72       SUBAREA RUNOFF(CFS) =  134.55
 EFFECTIVE AREA(ACRES) =   4135.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     4135.8         PEAK FLOW RATE(CFS) =    3506.97
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.73

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.73   FLOW VELOCITY(FEET/SEC.) =   8.17
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11724.00 =   34622.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11724.00 TO NODE  11725.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    546.77  DOWNSTREAM(FEET) =    483.75
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2921.33   CHANNEL SLOPE =  0.0216
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.80
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.195
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      134.67      0.30     0.917     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3562.72
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.13
 AVERAGE FLOW DEPTH(FEET) =   3.80   TRAVEL TIME(MIN.) =   5.99
 Tc(MIN.) =   69.22
 SUBAREA AREA(ACRES) =   134.67       SUBAREA RUNOFF(CFS) =  111.50
 EFFECTIVE AREA(ACRES) =   4270.43     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =     4270.4         PEAK FLOW RATE(CFS) =    3506.97
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.77

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.77   FLOW VELOCITY(FEET/SEC.) =   8.08
 LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11725.00 =   37543.75 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    483.75  DOWNSTREAM(FEET) =    436.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2685.66   CHANNEL SLOPE =  0.0177
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.03
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.155
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      121.44      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3553.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.61
  AVERAGE FLOW DEPTH(FEET) =   4.02   TRAVEL TIME(MIN.) =   5.88
  Tc(MIN.) =   75.11
  SUBAREA AREA(ACRES) =   121.44       SUBAREA RUNOFF(CFS) =   93.89
  EFFECTIVE AREA(ACRES) =   4391.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4391.9         PEAK FLOW RATE(CFS) =    3506.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.99   FLOW VELOCITY(FEET/SEC.) =   7.57
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     4391.9  TC(MIN.) =     75.11
  EFFECTIVE AREA(ACRES) =   4391.87  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.995
  PEAK FLOW RATE(CFS)   =    3506.97

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2677.44   44.89    1.426  0.30( 0.30) 0.99    2213.6   11701.00
      2     3475.32   72.88    1.170  0.30( 0.30) 0.99    4278.6   11620.00
      3     3506.97   75.11    1.155  0.30( 0.30) 0.99    4391.9   11600.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:
```

```
------------------------------------------------------------------------
  FILE NAME: S18.DAT
  TIME/DATE OF STUDY: 11:58 04/03/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.806
   2)   10.00;  3.657
   3)   15.00;  2.768
   4)   20.00;  2.299
   5)   25.00;  1.975
   6)   30.00;  1.780
   7)   40.00;  1.501
   8)   50.00;  1.340
   9)   60.00;  1.252
  10)   90.00;  1.047
  11)  120.00;  0.917
  12)  180.00;  0.801
  13)  360.00;  0.604
  14) 1440.00;  0.269
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11801.00 TO NODE  11802.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   970.31
  ELEVATION DATA: UPSTREAM(FEET) =    834.89  DOWNSTREAM(FEET) =    727.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.170
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.564
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        7.24      0.30     1.000     0   17.17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     14.76
  TOTAL AREA(ACRES) =      7.24   PEAK FLOW RATE(CFS) =     14.76

************************************************************************
  FLOW PROCESS FROM NODE  11802.00 TO NODE  11803.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    727.50  DOWNSTREAM(FEET) =    674.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   968.10   CHANNEL SLOPE =  0.0551
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.235
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.08      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.22
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   20.99
  SUBAREA AREA(ACRES) =    22.08       SUBAREA RUNOFF(CFS) =   38.45
  EFFECTIVE AREA(ACRES) =     29.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3          PEAK FLOW RATE(CFS) =      51.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   4.82
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11803.00 =    1938.41 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11803.00 TO NODE  11804.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    674.12  DOWNSTREAM(FEET) =    554.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.27   CHANNEL SLOPE =  0.0642
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.923
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.82
  AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   5.34
  Tc(MIN.) =   26.33
  SUBAREA AREA(ACRES) =    35.55       SUBAREA RUNOFF(CFS) =   51.93
  EFFECTIVE AREA(ACRES) =     64.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       64.9         PEAK FLOW RATE(CFS) =      94.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   6.21
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11804.00 =    3802.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    554.40  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1767.25   CHANNEL SLOPE =  0.0738
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.36
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.765
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     118.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.00
  AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   4.21
  Tc(MIN.) =   30.54
  SUBAREA AREA(ACRES) =    36.70       SUBAREA RUNOFF(CFS) =   48.39
  EFFECTIVE AREA(ACRES) =    101.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      101.6         PEAK FLOW RATE(CFS) =     133.93
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOW VELOCITY(FEET/SEC.) =   7.27
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11821.00 =    5569.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S15.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    17460.22   38.44  0.30( 0.30) 1.00    7646.0   11500.00
      2    17769.99   40.10  0.30( 0.30) 1.00    8170.5   11530.00
      3    18960.92   47.38  0.30( 0.30) 1.00   10336.2   11000.00
      4    21080.84   57.57  0.30( 0.30) 1.00   14565.2   11330.00
      5    21444.52   59.84  0.30( 0.30) 1.00   15557.6   10800.00
      6    21699.33   61.57  0.30( 0.30) 1.00   16378.5   10900.00
      7    21828.00   62.79  0.30( 0.30) 1.00   16909.3   11300.00
      8    21953.75   64.30  0.30( 0.30) 1.00   17537.4   11130.00
      9    21884.07   65.64  0.30( 0.30) 1.00   17927.5   10630.00
     10    21416.09   76.73  0.30( 0.30) 1.00   21106.6   10600.00
     11    21370.69   82.06  0.30( 0.30) 1.00   22650.9   11201.00
     12    21338.53   83.38  0.30( 0.30) 1.00   22951.3   10500.00
     13    21217.68   87.64  0.30( 0.30) 1.00   23834.6   10710.00
     14    21116.12   89.61  0.30( 0.30) 1.00   24166.7   10410.00
     15    20718.23   94.22  0.30( 0.30) 1.00   24827.7   10700.00
     16    20139.05  101.11  0.30( 0.30) 1.00   25746.8   10400.00
     17    19994.53  103.40  0.30( 0.30) 1.00   26016.6   10200.00
     18    19489.84  109.25  0.30( 0.30) 1.00   26595.9   10300.00
     19    18951.58  114.21  0.30( 0.30) 1.00   26800.5   10210.00
     20    16702.32  140.88  0.30( 0.30) 1.00   27497.1   10100.00
    TOTAL AREA(ACRES) =    27497.1

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S17.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2677.44   44.89  0.30( 0.30) 0.99    2213.6   11701.00
      2     3475.32   72.88  0.30( 0.30) 0.99    4278.6   11620.00
      3     3506.97   75.11  0.30( 0.30) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =     4391.9
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2677.44   44.89  0.30( 0.30) 0.99    2213.6   11701.00
      2     3475.32   72.88  0.30( 0.30) 0.99    4278.6   11620.00
      3     3506.97   75.11  0.30( 0.30) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =      4391.9

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2677.44   44.89    1.422  0.30( 0.30) 0.99    2213.6   11701.00
      2     3475.32   72.88    1.164  0.30( 0.30) 0.99    4278.6   11620.00
      3     3506.97   75.11    1.149  0.30( 0.30) 0.99    4391.9   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    17460.22   38.44    1.545  0.30( 0.30) 1.00    7646.0   11500.00
      2    17769.99   40.10    1.499  0.30( 0.30) 1.00    8170.5   11530.00
      3    18960.92   47.38    1.382  0.30( 0.30) 1.00   10336.2   11000.00
      4    21080.84   57.57    1.273  0.30( 0.30) 1.00   14565.2   11330.00
      5    21444.52   59.84    1.253  0.30( 0.30) 1.00   15557.6   10800.00
      6    21699.33   61.57    1.241  0.30( 0.30) 1.00   16378.5   10900.00
      7    21828.00   62.79    1.233  0.30( 0.30) 1.00   16909.3   11300.00
      8    21953.75   64.30    1.223  0.30( 0.30) 1.00   17537.4   11130.00
      9    21884.07   65.64    1.213  0.30( 0.30) 1.00   17927.5   10630.00
     10    21416.09   76.73    1.138  0.30( 0.30) 1.00   21106.6   10600.00
     11    21370.69   82.06    1.101  0.30( 0.30) 1.00   22650.9   11201.00
     12    21338.53   83.38    1.092  0.30( 0.30) 1.00   22951.3   10500.00
     13    21217.68   87.64    1.063  0.30( 0.30) 1.00   23834.6   10710.00
     14    21116.12   89.61    1.050  0.30( 0.30) 1.00   24166.7   10410.00
     15    20718.23   94.22    1.029  0.30( 0.30) 1.00   24827.7   10700.00
     16    20139.05  101.11    0.999  0.30( 0.30) 1.00   25746.8   10400.00
     17    19994.53  103.40    0.989  0.30( 0.30) 1.00   26016.6   10200.00
     18    19489.84  109.25    0.964  0.30( 0.30) 1.00   26595.9   10300.00
     19    18951.58  114.21    0.942  0.30( 0.30) 1.00   26800.5   10210.00
     20    16702.32  140.88    0.877  0.30( 0.30) 1.00   27497.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20002.22   38.44    1.545  0.30( 0.30) 0.99    9541.6   11500.00
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      2    20325.78   40.10    1.499  0.30( 0.30) 0.99   10148.0   11530.00
      3    21230.48   44.89    1.422  0.30( 0.30) 1.00   11808.1   11701.00
      4    21709.43   47.38    1.382  0.30( 0.30) 1.00   12733.7   11000.00
      5    24119.72   57.57    1.273  0.30( 0.30) 1.00   17714.2   11330.00
      6    24548.01   59.84    1.253  0.30( 0.30) 1.00   18873.9   10800.00
      7    24852.18   61.57    1.241  0.30( 0.30) 1.00   19822.5   10900.00
      8    25015.78   62.79    1.233  0.30( 0.30) 1.00   20443.8   11300.00
      9    25184.55   64.30    1.223  0.30( 0.30) 1.00   21183.1   11130.00
     10    25153.08   65.64    1.213  0.30( 0.30) 1.00   21672.2   10630.00
     11    25053.90   72.88    1.164  0.30( 0.30) 1.00   24281.4   11620.00
     12    24991.78   75.11    1.149  0.30( 0.30) 1.00   25031.6   11600.00
     13    24877.17   76.73    1.138  0.30( 0.30) 1.00   25498.4   10600.00
     14    24681.66   82.06    1.101  0.30( 0.30) 1.00   27042.7   11201.00
     15    24612.24   83.38    1.092  0.30( 0.30) 1.00   27343.1   10500.00
     16    24371.39   87.64    1.063  0.30( 0.30) 1.00   28226.5   10710.00
     17    24214.52   89.61    1.050  0.30( 0.30) 1.00   28558.6   10410.00
     18    23730.08   94.22    1.029  0.30( 0.30) 1.00   29219.6   10700.00
     19    23027.83  101.11    0.999  0.30( 0.30) 1.00   30138.7   10400.00
     20    22842.37  103.40    0.989  0.30( 0.30) 1.00   30408.5   10200.00
     21    22233.13  109.25    0.964  0.30( 0.30) 1.00   30987.8   10300.00
     22    21606.21  114.21    0.942  0.30( 0.30) 1.00   31192.4   10210.00
     23    19087.10  140.88    0.877  0.30( 0.30) 1.00   31889.0   10100.00
   TOTAL AREA(ACRES) =     31889.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    25184.55  Tc(MIN.) =   64.304
  EFFECTIVE AREA(ACRES) =  21183.14  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    31889.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11726.00 TO NODE  11821.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.21  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1621.39   CHANNEL SLOPE =  0.0076
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.13
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.209
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       59.69      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   25208.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.00
  AVERAGE FLOW DEPTH(FEET) =  12.13   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   66.23
  SUBAREA AREA(ACRES) =    59.69       SUBAREA RUNOFF(CFS) =   48.86
  EFFECTIVE AREA(ACRES) =  21242.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    31948.7         PEAK FLOW RATE(CFS) =   25184.55
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
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GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 12.12 FLOW VELOCITY(FEET/SEC.) = 13.99
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20002.22	40.51	1.493	0.30(0.30)	0.99	9601.3	11500.00
2	20325.78	42.16	1.466	0.30(0.30)	0.99	10207.7	11530.00
3	21230.48	46.92	1.390	0.30(0.30)	1.00	11867.8	11701.00
4	21709.43	49.40	1.350	0.30(0.30)	1.00	12793.4	11000.00
5	24119.72	59.53	1.256	0.30(0.30)	1.00	17773.9	11330.00
6	24548.01	61.78	1.240	0.30(0.30)	1.00	18933.6	10800.00
7	24852.18	63.51	1.228	0.30(0.30)	1.00	19882.2	10900.00
8	25015.78	64.73	1.220	0.30(0.30)	1.00	20503.5	11300.00
9	25184.55	66.23	1.209	0.30(0.30)	1.00	21242.8	11130.00
10	25153.08	67.58	1.200	0.30(0.30)	1.00	21731.9	10630.00
11	25053.90	74.82	1.151	0.30(0.30)	1.00	24341.1	11620.00
12	24991.78	77.04	1.136	0.30(0.30)	1.00	25091.3	11600.00
13	24877.17	78.67	1.124	0.30(0.30)	1.00	25558.1	10600.00
14	24681.66	84.00	1.088	0.30(0.30)	1.00	27102.4	11201.00
15	24612.24	85.33	1.079	0.30(0.30)	1.00	27402.8	10500.00
16	24371.39	89.59	1.050	0.30(0.30)	1.00	28286.2	10710.00
17	24214.52	91.56	1.040	0.30(0.30)	1.00	28618.3	10410.00
18	23730.08	96.19	1.020	0.30(0.30)	1.00	29279.3	10700.00
19	23027.83	103.09	0.990	0.30(0.30)	1.00	30198.4	10400.00
20	22842.37	105.39	0.980	0.30(0.30)	1.00	30468.2	10200.00
21	22233.13	111.26	0.955	0.30(0.30)	1.00	31047.4	10300.00
22	21606.21	116.23	0.933	0.30(0.30)	1.00	31252.1	10210.00
23	19087.10	142.98	0.873	0.30(0.30)	1.00	31948.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	133.93	30.54	1.765	0.30(0.30)	1.00	101.6	11801.00

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18649.09	30.54	1.765	0.30(0.30)	0.99	7339.8	11801.00
2	20111.27	40.51	1.493	0.30(0.30)	0.99	9702.9	11500.00
3	20432.40	42.16	1.466	0.30(0.30)	0.99	10309.3	11530.00
4	21330.10	46.92	1.390	0.30(0.30)	1.00	11969.3	11701.00
5	21805.39	49.40	1.350	0.30(0.30)	1.00	12895.0	11000.00
6	24207.14	59.53	1.256	0.30(0.30)	1.00	17875.5	11330.00
7	24633.93	61.78	1.240	0.30(0.30)	1.00	19035.1	10800.00

8	24937.02	63.51	1.228	0.30(0.30)	1.00	19983.8	10900.00
9	25099.85	64.73	1.220	0.30(0.30)	1.00	20605.0	11300.00
10	25267.69	66.23	1.209	0.30(0.30)	1.00	21344.4	11130.00
11	25235.38	67.58	1.200	0.30(0.30)	1.00	21833.5	10630.00
12	25131.67	74.82	1.151	0.30(0.30)	1.00	24442.7	11620.00
13	25068.17	77.04	1.136	0.30(0.30)	1.00	25192.9	11600.00
14	24952.54	78.67	1.124	0.30(0.30)	1.00	25659.7	10600.00
15	24753.70	84.00	1.088	0.30(0.30)	1.00	27204.0	11201.00
16	24683.45	85.33	1.079	0.30(0.30)	1.00	27504.4	10500.00
17	24439.93	89.59	1.050	0.30(0.30)	1.00	28387.7	10710.00
18	24282.20	91.56	1.040	0.30(0.30)	1.00	28719.8	10410.00
19	23795.92	96.19	1.020	0.30(0.30)	1.00	29380.8	10700.00
20	23090.93	103.09	0.990	0.30(0.30)	1.00	30299.9	10400.00
21	22904.57	105.39	0.980	0.30(0.30)	1.00	30569.7	10200.00
22	22293.00	111.26	0.955	0.30(0.30)	1.00	31149.0	10300.00
23	21664.11	116.23	0.933	0.30(0.30)	1.00	31353.7	10210.00
24	19139.44	142.98	0.873	0.30(0.30)	1.00	32050.3	10100.00

TOTAL AREA(ACRES) = 32050.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 25267.69 Tc(MIN.) = 66.235
EFFECTIVE AREA(ACRES) = 21344.40 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32050.3
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 423.93 DOWNSTREAM(FEET) = 402.38
CHANNEL LENGTH THRU SUBAREA(FEET) = 1912.90 CHANNEL SLOPE = 0.0113
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.69
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.194
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.91	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25348.89
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.85
AVERAGE FLOW DEPTH(FEET) = 7.68 TRAVEL TIME(MIN.) = 2.30
Tc(MIN.) = 68.54
SUBAREA AREA(ACRES) = 201.91 SUBAREA RUNOFF(CFS) = 162.41
EFFECTIVE AREA(ACRES) = 21546.31 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32252.2 PEAK FLOW RATE(CFS) = 25267.69
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

```
  DEPTH(FEET) =  7.66   FLOW VELOCITY(FEET/SEC.) =  13.83
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11822.00 =   92657.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    402.38  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2380.10   CHANNEL SLOPE =  0.0091
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.16
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.173
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   25313.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.88
  AVERAGE FLOW DEPTH(FEET) =   8.16   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   71.62
  SUBAREA AREA(ACRES) =   116.13       SUBAREA RUNOFF(CFS) =   91.21
  EFFECTIVE AREA(ACRES) =  21662.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    32368.3         PEAK FLOW RATE(CFS) =   25267.69
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.15   FLOW VELOCITY(FEET/SEC.) =  12.88
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   71.62
  RAINFALL INTENSITY(INCH/HR) =   1.17
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   21662.44
  TOTAL STREAM AREA(ACRES) =   32368.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   25267.69

****************************************************************************
  FLOW PROCESS FROM NODE  11831.00 TO NODE  11832.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```



```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.20
  ELEVATION DATA: UPSTREAM(FEET) =   1353.30  DOWNSTREAM(FEET) =   1280.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.179
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.440
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.76      0.30     1.000     0    8.18
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.83
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      2.83

****************************************************************************
  FLOW PROCESS FROM NODE  11832.00 TO NODE  11833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1280.02  DOWNSTREAM(FEET) =   1070.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   686.67   CHANNEL SLOPE =  0.3057
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.568
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.93
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   2.32
  Tc(MIN.) =   10.50
  SUBAREA AREA(ACRES) =     5.95       SUBAREA RUNOFF(CFS) =   17.50
  EFFECTIVE AREA(ACRES) =      6.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =      19.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.31   FLOW VELOCITY(FEET/SEC.) =   6.00
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11833.00 =     934.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11833.00 TO NODE  11834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   1070.08  DOWNSTREAM(FEET) =    913.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.36   CHANNEL SLOPE =  0.1601
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.141
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.79
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   2.40
  Tc(MIN.) =   12.90
  SUBAREA AREA(ACRES) =    23.21       SUBAREA RUNOFF(CFS) =   59.36
  EFFECTIVE AREA(ACRES) =     29.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.9         PEAK FLOW RATE(CFS) =      76.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   7.86
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11834.00 =    1912.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11834.00 TO NODE  11835.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    913.56  DOWNSTREAM(FEET) =    727.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.63   CHANNEL SLOPE =  0.0989
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.616
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     153.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.40
  AVERAGE FLOW DEPTH(FEET) =   1.42   TRAVEL TIME(MIN.) =   3.72
  Tc(MIN.) =   16.62
  SUBAREA AREA(ACRES) =    73.73       SUBAREA RUNOFF(CFS) =  153.69
  EFFECTIVE AREA(ACRES) =    103.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      103.7         PEAK FLOW RATE(CFS) =     216.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.72
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.72   FLOW VELOCITY(FEET/SEC.) =   9.34
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11835.00 =    3787.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11835.00 TO NODE  11836.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    727.99  DOWNSTREAM(FEET) =    611.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.64   CHANNEL SLOPE =  0.0615
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.41
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.282
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       93.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     299.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.68
  AVERAGE FLOW DEPTH(FEET) =   2.35   TRAVEL TIME(MIN.) =   3.64
  Tc(MIN.) =   20.26
  SUBAREA AREA(ACRES) =    93.31       SUBAREA RUNOFF(CFS) =  166.46
  EFFECTIVE AREA(ACRES) =    196.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      197.0         PEAK FLOW RATE(CFS) =     351.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.56   FLOW VELOCITY(FEET/SEC.) =   9.08
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11836.00 =    5684.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11836.00 TO NODE  11837.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    611.39  DOWNSTREAM(FEET) =    508.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2178.15   CHANNEL SLOPE =  0.0472
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.09
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.013
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.92      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     427.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.74
```

```
  AVERAGE FLOW DEPTH(FEET) =   3.04   TRAVEL TIME(MIN.) =   4.15
  Tc(MIN.) =   24.41
  SUBAREA AREA(ACRES) =    98.92       SUBAREA RUNOFF(CFS) =  152.52
  EFFECTIVE AREA(ACRES) =    295.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      295.9         PEAK FLOW RATE(CFS) =     456.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.15   FLOW VELOCITY(FEET/SEC.) =   8.90
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11837.00 =    7862.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11837.00 TO NODE  11838.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    508.59  DOWNSTREAM(FEET) =    448.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1942.91   CHANNEL SLOPE =  0.0309
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.74
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.838
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     511.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.88
  AVERAGE FLOW DEPTH(FEET) =   3.72   TRAVEL TIME(MIN.) =   4.11
  Tc(MIN.) =   28.52
  SUBAREA AREA(ACRES) =    79.71       SUBAREA RUNOFF(CFS) =  110.32
  EFFECTIVE AREA(ACRES) =    375.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      375.6         PEAK FLOW RATE(CFS) =     519.80
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.75   FLOW VELOCITY(FEET/SEC.) =   7.92
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.00 =    9805.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.00 TO NODE  11838.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    448.50  DOWNSTREAM(FEET) =    420.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =   917.65   CHANNEL SLOPE =  0.0302
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.768
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     542.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.94
  AVERAGE FLOW DEPTH(FEET) =   3.86   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   30.45
  SUBAREA AREA(ACRES) =    34.57       SUBAREA RUNOFF(CFS) =   45.66
  EFFECTIVE AREA(ACRES) =    410.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      410.2         PEAK FLOW RATE(CFS) =     541.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.86   FLOW VELOCITY(FEET/SEC.) =   7.93
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.50 =   10723.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    420.79  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1615.83   CHANNEL SLOPE =  0.0248
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.10
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.667
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.54      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     555.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.44
  AVERAGE FLOW DEPTH(FEET) =   4.10   TRAVEL TIME(MIN.) =   3.62
  Tc(MIN.) =   34.07
  SUBAREA AREA(ACRES) =    21.54       SUBAREA RUNOFF(CFS) =   26.49
  EFFECTIVE AREA(ACRES) =    431.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      431.7         PEAK FLOW RATE(CFS) =     541.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.05   FLOW VELOCITY(FEET/SEC.) =   7.39
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11841.00 =   12339.04 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.07
  RAINFALL INTENSITY(INCH/HR) =   1.67
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     431.70
  TOTAL STREAM AREA(ACRES) =     431.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     541.75

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    18649.09   36.49    1.599  0.30( 0.30) 0.99    7657.9   11801.00
      1    20111.27   46.31    1.399  0.30( 0.30) 0.99   10020.9   11500.00
      1    20432.40   47.94    1.373  0.30( 0.30) 1.00   10627.3   11530.00
      1    21330.10   52.62    1.317  0.30( 0.30) 1.00   12287.4   11701.00
      1    21805.39   55.05    1.296  0.30( 0.30) 1.00   13213.0   11000.00
      1    24207.14   64.98    1.218  0.30( 0.30) 1.00   18193.5   11330.00
      1    24633.93   67.21    1.203  0.30( 0.30) 1.00   19353.2   10800.00
      1    24937.02   68.91    1.191  0.30( 0.30) 1.00   20301.8   10900.00
      1    25099.85   70.12    1.183  0.30( 0.30) 1.00   20923.1   11300.00
      1    25267.69   71.62    1.173  0.30( 0.30) 1.00   21662.4   11130.00
      1    25235.38   72.96    1.163  0.30( 0.30) 1.00   22151.5   10630.00
      1    25131.67   80.21    1.114  0.30( 0.30) 1.00   24760.7   11620.00
      1    25068.17   82.44    1.099  0.30( 0.30) 1.00   25510.9   11600.00
      1    24952.54   84.08    1.087  0.30( 0.30) 1.00   25977.7   10600.00
      1    24753.70   89.42    1.051  0.30( 0.30) 1.00   27522.0   11201.00
      1    24683.45   90.75    1.044  0.30( 0.30) 1.00   27822.4   10500.00
      1    24439.93   95.04    1.025  0.30( 0.30) 1.00   28705.8   10710.00
      1    24282.20   97.01    1.017  0.30( 0.30) 1.00   29037.9   10410.00
      1    23795.92  101.68    0.996  0.30( 0.30) 1.00   29698.9   10700.00
      1    23090.93  108.64    0.966  0.30( 0.30) 1.00   30618.0   10400.00
      1    22904.57  110.95    0.956  0.30( 0.30) 1.00   30887.8   10200.00
      1    22293.00  116.87    0.931  0.30( 0.30) 1.00   31467.1   10300.00
      1    21664.11  121.90    0.913  0.30( 0.30) 1.00   31671.7   10210.00
      1    19139.44  148.89    0.861  0.30( 0.30) 1.00   32368.3   10100.00
      2      541.75   34.07    1.667  0.30( 0.30) 1.00     431.7   11831.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    18857.19   34.07    1.667  0.30( 0.30) 1.00    7580.3   11831.00
      2    19164.00   36.49    1.599  0.30( 0.30) 1.00    8089.6   11801.00
      3    20547.11   46.31    1.399  0.30( 0.30) 1.00   10452.6   11500.00
      4    20857.89   47.94    1.373  0.30( 0.30) 1.00   11059.0   11530.00
      5    21733.29   52.62    1.317  0.30( 0.30) 1.00   12719.1   11701.00
```



```
      6    22200.08   55.05    1.296  0.30( 0.30) 1.00   13644.7   11000.00
      7    24571.06   64.98    1.218  0.30( 0.30) 1.00   18625.2   11330.00
      8    24991.82   67.21    1.203  0.30( 0.30) 1.00   19784.9   10800.00
      9    25290.30   68.91    1.191  0.30( 0.30) 1.00   20733.5   10900.00
     10    25449.86   70.12    1.183  0.30( 0.30) 1.00   21354.8   11300.00
     11    25613.65   71.62    1.173  0.30( 0.30) 1.00   22094.1   11130.00
     12    25577.70   72.96    1.163  0.30( 0.30) 1.00   22583.2   10630.00
     13    25454.36   80.21    1.114  0.30( 0.30) 1.00   25192.4   11620.00
     14    25384.82   82.44    1.099  0.30( 0.30) 1.00   25942.6   11600.00
     15    25264.75   84.08    1.087  0.30( 0.30) 1.00   26409.4   10600.00
     16    25051.43   89.42    1.051  0.30( 0.30) 1.00   27953.7   11201.00
     17    24978.32   90.75    1.044  0.30( 0.30) 1.00   28254.1   10500.00
     18    24727.44   95.04    1.025  0.30( 0.30) 1.00   29137.5   10710.00
     19    24566.31   97.01    1.017  0.30( 0.30) 1.00   29469.6   10410.00
     20    24072.02  101.68    0.996  0.30( 0.30) 1.00   30130.6   10700.00
     21    23355.07  108.64    0.966  0.30( 0.30) 1.00   31049.7   10400.00
     22    23164.74  110.95    0.956  0.30( 0.30) 1.00   31319.5   10200.00
     23    22543.01  116.87    0.931  0.30( 0.30) 1.00   31898.8   10300.00
     24    21907.27  121.90    0.913  0.30( 0.30) 1.00   32103.4   10210.00
     25    19361.93  148.89    0.861  0.30( 0.30) 1.00   32800.0   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   25613.65    Tc(MIN.) =    71.62
  EFFECTIVE AREA(ACRES) =   22094.14   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    32800.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  12527.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.74  DOWNSTREAM(FEET) =    347.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2830.43   CHANNEL SLOPE =  0.0118
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.64
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.59      0.30     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   25658.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.10
  AVERAGE FLOW DEPTH(FEET) =   7.64   TRAVEL TIME(MIN.) =   3.35
  Tc(MIN.) =   74.96
  SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =   89.27
  EFFECTIVE AREA(ACRES) =  22210.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    32916.6         PEAK FLOW RATE(CFS) =   25613.65
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.63
```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.63 FLOW VELOCITY(FEET/SEC.) = 14.09
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 74.96
EFFECTIVE AREA(ACRES) = 22210.73 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997
PEAK FLOW RATE(CFS) = 25613.65

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18857.19	37.78	1.563	0.30(0.30)	1.00	7696.9	11831.00
2	19164.00	40.18	1.498	0.30(0.30)	1.00	8206.2	11801.00
3	20547.11	49.92	1.341	0.30(0.30)	1.00	10569.2	11500.00
4	20857.89	51.52	1.327	0.30(0.30)	1.00	11175.6	11530.00
5	21733.29	56.15	1.286	0.30(0.30)	1.00	12835.7	11701.00
6	22200.08	58.56	1.265	0.30(0.30)	1.00	13761.3	11000.00
7	24571.06	68.38	1.195	0.30(0.30)	1.00	18741.8	11330.00
8	24991.82	70.58	1.180	0.30(0.30)	1.00	19901.5	10800.00
9	25290.30	72.27	1.168	0.30(0.30)	1.00	20850.1	10900.00
10	25449.86	73.48	1.160	0.30(0.30)	1.00	21471.4	11300.00
11	25613.65	74.96	1.150	0.30(0.30)	1.00	22210.7	11130.00
12	25577.70	76.31	1.141	0.30(0.30)	1.00	22699.8	10630.00
13	25454.36	83.56	1.091	0.30(0.30)	1.00	25309.0	11620.00
14	25384.82	85.79	1.076	0.30(0.30)	1.00	26059.2	11600.00
15	25264.75	87.44	1.065	0.30(0.30)	1.00	26526.0	10600.00
16	25051.43	92.79	1.035	0.30(0.30)	1.00	28070.3	11201.00
17	24978.32	94.13	1.029	0.30(0.30)	1.00	28370.7	10500.00
18	24727.44	98.42	1.011	0.30(0.30)	1.00	29254.1	10710.00
19	24566.31	100.41	1.002	0.30(0.30)	1.00	29586.2	10410.00
20	24072.02	105.10	0.982	0.30(0.30)	1.00	30247.2	10700.00
21	23355.07	112.09	0.951	0.30(0.30)	1.00	31166.3	10400.00
22	23164.74	114.41	0.941	0.30(0.30)	1.00	31436.1	10200.00
23	22543.01	120.36	0.916	0.30(0.30)	1.00	32015.3	10300.00
24	21907.27	125.43	0.907	0.30(0.30)	1.00	32220.0	10210.00
25	19361.93	152.56	0.854	0.30(0.30)	1.00	32916.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S19.DAT
  TIME/DATE OF STUDY: 09:43 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.535
   2)   10.00;  3.529
   3)   15.00;  2.693
   4)   20.00;  2.246
   5)   25.00;  1.938
   6)   30.00;  1.744
   7)   40.00;  1.475
   8)   50.00;  1.313
   9)   60.00;  1.214
  10)   90.00;  1.010
  11)  120.00;  0.880
  12)  180.00;  0.760
  13)  360.00;  0.566
  14) 1200.00;  0.250
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11900.00 TO NODE  11901.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.79
  ELEVATION DATA: UPSTREAM(FEET) =   2369.48  DOWNSTREAM(FEET) =   2332.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.203
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.651
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"          -        1.62      0.30     0.999     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  SUBAREA RUNOFF(CFS) =      6.34
  TOTAL AREA(ACRES) =      1.62   PEAK FLOW RATE(CFS) =      6.34

**************************************************************************
  FLOW PROCESS FROM NODE  11901.00 TO NODE  11902.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2332.92  DOWNSTREAM(FEET) =   2297.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   664.26   CHANNEL SLOPE =  0.0530
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.57
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.443
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.35      0.30     0.906     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.34
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   10.52
  SUBAREA AREA(ACRES) =     8.35       SUBAREA RUNOFF(CFS) =   23.83
  EFFECTIVE AREA(ACRES) =      9.97     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =       10.0          PEAK FLOW RATE(CFS) =      28.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   3.90
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.00 =     960.05 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11902.00 TO NODE  11902.50 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2297.70  DOWNSTREAM(FEET) =   2263.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.77   CHANNEL SLOPE =  0.0369
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.28
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.887
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.48      0.30     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.65
  AVERAGE FLOW DEPTH(FEET) =   1.20   TRAVEL TIME(MIN.) =   3.33
  Tc(MIN.) =   13.84
  SUBAREA AREA(ACRES) =    34.48       SUBAREA RUNOFF(CFS) =   81.16
  EFFECTIVE AREA(ACRES) =     44.45     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.91
  TOTAL AREA(ACRES) =       44.5         PEAK FLOW RATE(CFS) =     104.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =   5.30
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.50 =    1888.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11902.50 TO NODE  11903.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.40  DOWNSTREAM(FEET) =   2252.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   895.50   CHANNEL SLOPE =  0.0126
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.451
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.65      0.30     0.958     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.958
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     127.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.87
  AVERAGE FLOW DEPTH(FEET) =   2.27   TRAVEL TIME(MIN.) =   3.86
  Tc(MIN.) =   17.70
  SUBAREA AREA(ACRES) =    23.65       SUBAREA RUNOFF(CFS) =   46.06
  EFFECTIVE AREA(ACRES) =     68.10     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       68.1         PEAK FLOW RATE(CFS) =     133.24
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.32   FLOW VELOCITY(FEET/SEC.) =   3.91
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11903.00 =    2784.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11903.00 TO NODE  11904.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2252.14  DOWNSTREAM(FEET) =   2186.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.35   CHANNEL SLOPE =  0.0343
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.21
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.067
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.53      0.30     0.961     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.961
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     188.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.16
  AVERAGE FLOW DEPTH(FEET) =   2.14   TRAVEL TIME(MIN.) =   5.20
  Tc(MIN.) =   22.91
  SUBAREA AREA(ACRES) =    68.53       SUBAREA RUNOFF(CFS) =  109.71
  EFFECTIVE AREA(ACRES) =    136.63     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      136.6         PEAK FLOW RATE(CFS) =     219.39
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.32   FLOW VELOCITY(FEET/SEC.) =   6.45
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11904.00 =    4708.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11904.00 TO NODE  11905.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2186.04  DOWNSTREAM(FEET) =   1957.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.87   CHANNEL SLOPE =  0.1187
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.901
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       63.15      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     264.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.57
  AVERAGE FLOW DEPTH(FEET) =   1.83   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   25.94
  SUBAREA AREA(ACRES) =    63.15       SUBAREA RUNOFF(CFS) =   91.02
  EFFECTIVE AREA(ACRES) =    199.78     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      199.8         PEAK FLOW RATE(CFS) =     290.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =  10.86
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11905.00 =    6635.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11905.00 TO NODE  11906.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1957.34  DOWNSTREAM(FEET) =   1244.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2498.96   CHANNEL SLOPE =  0.2854
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.797
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     347.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.54
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   28.62
  SUBAREA AREA(ACRES) =    84.87       SUBAREA RUNOFF(CFS) =  114.38
  EFFECTIVE AREA(ACRES) =    284.65     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      284.6         PEAK FLOW RATE(CFS) =     385.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =  16.06
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11906.00 =    9134.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   1244.16  DOWNSTREAM(FEET) =    873.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3370.75   CHANNEL SLOPE =  0.1098
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.70
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.659
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     507.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.43
  AVERAGE FLOW DEPTH(FEET) =   2.67   TRAVEL TIME(MIN.) =   4.52
  Tc(MIN.) =   33.14
  SUBAREA AREA(ACRES) =   199.43       SUBAREA RUNOFF(CFS) =  244.01
  EFFECTIVE AREA(ACRES) =    484.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      484.1         PEAK FLOW RATE(CFS) =     594.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.90   FLOW VELOCITY(FEET/SEC.) =  12.99
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11920.00 =   12505.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.14
  RAINFALL INTENSITY(INCH/HR) =   1.66
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98
  EFFECTIVE STREAM AREA(ACRES) =     484.08
  TOTAL STREAM AREA(ACRES) =     484.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     594.38

****************************************************************************
  FLOW PROCESS FROM NODE  11910.00 TO NODE  11911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   517.62
  ELEVATION DATA: UPSTREAM(FEET) =   2531.88  DOWNSTREAM(FEET) =   2441.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.185
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.164
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        3.46      0.30      1.000     0   12.19
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.92
  TOTAL AREA(ACRES) =      3.46   PEAK FLOW RATE(CFS) =      8.92

****************************************************************************
  FLOW PROCESS FROM NODE  11911.00 TO NODE  11912.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2441.33  DOWNSTREAM(FEET) =   2382.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   397.30   CHANNEL SLOPE =  0.1488
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.909
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        5.79      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.35
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   1.52
  Tc(MIN.) =   13.71
  SUBAREA AREA(ACRES) =     5.79       SUBAREA RUNOFF(CFS) =   13.60
  EFFECTIVE AREA(ACRES) =      9.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =      21.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =   4.93
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11912.00 =     914.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11912.00 TO NODE  11913.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2382.20  DOWNSTREAM(FEET) =   2263.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1891.47   CHANNEL SLOPE =  0.0626
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.308
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       54.30      0.30      1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      71.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   1.05   TRAVEL TIME(MIN.) =   5.60
  Tc(MIN.) =   19.31
  SUBAREA AREA(ACRES) =    54.30       SUBAREA RUNOFF(CFS) =   98.12
  EFFECTIVE AREA(ACRES) =     63.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       63.5          PEAK FLOW RATE(CFS) =     114.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   6.54
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11913.00 =    2806.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11913.00 TO NODE  11914.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.77  DOWNSTREAM(FEET) =   1845.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1957.31   CHANNEL SLOPE =  0.2138
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.110
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       65.14      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     167.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.26
  AVERAGE FLOW DEPTH(FEET) =   1.20   TRAVEL TIME(MIN.) =   2.90
  Tc(MIN.) =   22.21
  SUBAREA AREA(ACRES) =    65.14       SUBAREA RUNOFF(CFS) =  106.12
  EFFECTIVE AREA(ACRES) =    128.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      128.7          PEAK FLOW RATE(CFS) =     209.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.37   FLOW VELOCITY(FEET/SEC.) =  12.03
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11914.00 =    4763.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11914.00 TO NODE  11915.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1845.23  DOWNSTREAM(FEET) =   1557.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1686.78   CHANNEL SLOPE =  0.1708
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.69
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.966
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       78.52      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     268.54
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.02
 AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   2.34
 Tc(MIN.) =   24.55
 SUBAREA AREA(ACRES) =    78.52       SUBAREA RUNOFF(CFS) =  117.73
 EFFECTIVE AREA(ACRES) =    207.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      207.2          PEAK FLOW RATE(CFS) =     310.69
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.81   FLOW VELOCITY(FEET/SEC.) =  12.58
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11915.00 =    6450.48 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11915.00 TO NODE  11916.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1557.21  DOWNSTREAM(FEET) =   1403.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.39   CHANNEL SLOPE =  0.0806
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.42
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.833
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       70.48      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     359.32
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.08
 AVERAGE FLOW DEPTH(FEET) =   2.41   TRAVEL TIME(MIN.) =   3.16
 Tc(MIN.) =   27.70
 SUBAREA AREA(ACRES) =    70.48       SUBAREA RUNOFF(CFS) =   97.25
 EFFECTIVE AREA(ACRES) =    277.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      277.7          PEAK FLOW RATE(CFS) =     383.17
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.49
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.49   FLOW VELOCITY(FEET/SEC.) =  10.27
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11916.00 =    8359.87 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11916.00 TO NODE  11917.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1403.38  DOWNSTREAM(FEET) =   1079.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1945.82   CHANNEL SLOPE =  0.1662
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.747
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      232.20      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     534.42
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.62
 AVERAGE FLOW DEPTH(FEET) =   2.45   TRAVEL TIME(MIN.) =   2.22
 Tc(MIN.) =   29.92
 SUBAREA AREA(ACRES) =   232.20       SUBAREA RUNOFF(CFS) =  302.42
 EFFECTIVE AREA(ACRES) =    509.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      509.9          PEAK FLOW RATE(CFS) =     664.09
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.75

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.75   FLOW VELOCITY(FEET/SEC.) =  15.57
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11917.00 =   10305.69 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1079.99  DOWNSTREAM(FEET) =    873.95
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2563.91   CHANNEL SLOPE =  0.0804
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.51
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.653
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      110.82      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     731.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.30
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  AVERAGE FLOW DEPTH(FEET) =   3.50   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   33.40
  SUBAREA AREA(ACRES) =   110.82       SUBAREA RUNOFF(CFS) =  134.92
  EFFECTIVE AREA(ACRES) =    620.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      620.7         PEAK FLOW RATE(CFS) =     755.69
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.56   FLOW VELOCITY(FEET/SEC.) =  12.41
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.40
  RAINFALL INTENSITY(INCH/HR) =   1.65
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     620.71
  TOTAL STREAM AREA(ACRES) =     620.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     755.69

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      594.38   33.14    1.659  0.30( 0.30) 0.98     484.1   11900.00
      2      755.69   33.40    1.653  0.30( 0.30) 1.00     620.7   11910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1348.14   33.14    1.659  0.30( 0.30) 0.99    1100.1   11900.00
      2     1347.14   33.40    1.653  0.30( 0.30) 0.99    1104.8   11910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1348.14    Tc(MIN.) =    33.14
  EFFECTIVE AREA(ACRES) =    1100.13   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     1104.8
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11920.00 TO NODE  11921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



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============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    873.95  DOWNSTREAM(FEET) =    827.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1417.25   CHANNEL SLOPE =  0.0325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.07
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.599
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      107.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1410.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.52
  AVERAGE FLOW DEPTH(FEET) =   6.06   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =   35.39
  SUBAREA AREA(ACRES) =   107.47       SUBAREA RUNOFF(CFS) =  125.65
  EFFECTIVE AREA(ACRES) =   1207.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1212.3         PEAK FLOW RATE(CFS) =    1413.99
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.07   FLOW VELOCITY(FEET/SEC.) =  10.52
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11921.00 =   14286.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11921.00 TO NODE  11922.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    827.94  DOWNSTREAM(FEET) =    753.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.43   CHANNEL SLOPE =  0.0394
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.18
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.527
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      344.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1604.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.68
  AVERAGE FLOW DEPTH(FEET) =   6.15   TRAVEL TIME(MIN.) =   2.69
  Tc(MIN.) =   38.08
  SUBAREA AREA(ACRES) =   344.27       SUBAREA RUNOFF(CFS) =  380.08
  EFFECTIVE AREA(ACRES) =   1551.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1556.5         PEAK FLOW RATE(CFS) =    1715.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.35
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.35   FLOW VELOCITY(FEET/SEC.) =  11.89
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11922.00 =   16173.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11922.00 TO NODE  11923.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    753.55  DOWNSTREAM(FEET) =    641.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.88   CHANNEL SLOPE =  0.0391
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.53
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.442
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.18      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1800.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.01
  AVERAGE FLOW DEPTH(FEET) =   6.51   TRAVEL TIME(MIN.) =   3.97
  Tc(MIN.) =   42.05
  SUBAREA AREA(ACRES) =   165.18       SUBAREA RUNOFF(CFS) =  169.74
  EFFECTIVE AREA(ACRES) =   1717.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1721.7         PEAK FLOW RATE(CFS) =    1766.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.46   FLOW VELOCITY(FEET/SEC.) =  11.94
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11923.00 =   19034.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11923.00 TO NODE  11924.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    641.58  DOWNSTREAM(FEET) =    579.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1844.02   CHANNEL SLOPE =  0.0335
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.08
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.399
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      433.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1981.09
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.61
  AVERAGE FLOW DEPTH(FEET) =   7.07   TRAVEL TIME(MIN.) =   2.65
  Tc(MIN.) =   44.70
  SUBAREA AREA(ACRES) =   433.73       SUBAREA RUNOFF(CFS) =  428.97
  EFFECTIVE AREA(ACRES) =   2150.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2155.4         PEAK FLOW RATE(CFS) =    2129.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.31   FLOW VELOCITY(FEET/SEC.) =  11.83
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11924.00 =   20878.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11924.00 TO NODE  11925.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    579.89  DOWNSTREAM(FEET) =    494.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2756.15   CHANNEL SLOPE =  0.0311
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.65
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.335
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      265.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2252.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.68
  AVERAGE FLOW DEPTH(FEET) =   7.63   TRAVEL TIME(MIN.) =   3.93
  Tc(MIN.) =   48.63
  SUBAREA AREA(ACRES) =   265.42       SUBAREA RUNOFF(CFS) =  247.29
  EFFECTIVE AREA(ACRES) =   2416.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2420.9         PEAK FLOW RATE(CFS) =    2253.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.63   FLOW VELOCITY(FEET/SEC.) =  11.68
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11925.00 =   23634.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11925.00 TO NODE  11926.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    494.12  DOWNSTREAM(FEET) =    458.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1922.70   CHANNEL SLOPE =  0.0186
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.68
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.294
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       97.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2296.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.69
  AVERAGE FLOW DEPTH(FEET) =   8.67   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   51.94
  SUBAREA AREA(ACRES) =    97.46       SUBAREA RUNOFF(CFS) =   87.17
  EFFECTIVE AREA(ACRES) =   2513.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2518.3         PEAK FLOW RATE(CFS) =    2253.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.60   FLOW VELOCITY(FEET/SEC.) =   9.64
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11926.00 =   25557.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11926.00 TO NODE  11927.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    458.40  DOWNSTREAM(FEET) =    399.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2170.13   CHANNEL SLOPE =  0.0274
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.90
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.262
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2276.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.17
  AVERAGE FLOW DEPTH(FEET) =   7.90   TRAVEL TIME(MIN.) =   3.24
  Tc(MIN.) =   55.18
  SUBAREA AREA(ACRES) =    53.83       SUBAREA RUNOFF(CFS) =   46.60
  EFFECTIVE AREA(ACRES) =   2567.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2572.1         PEAK FLOW RATE(CFS) =    2253.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
  DEPTH(FEET) =  7.86   FLOW VELOCITY(FEET/SEC.) =  11.14
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610401X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      984.21   24.40  0.30( 0.30) 1.00     621.3   40120.00
      2      973.39   26.21  0.30( 0.30) 1.00     652.1   40100.00
    TOTAL AREA(ACRES) =      652.1

****************************************************************************
  FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2253.25   55.18    1.262  0.30( 0.30) 1.00    2567.5   11900.00
      2     2248.71   55.45    1.259  0.30( 0.30) 1.00    2572.1   11910.00
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      984.21   24.40    1.975  0.30( 0.30) 1.00     621.3   40120.00
      2      973.39   26.21    1.891  0.30( 0.30) 1.00     652.1   40100.00
  LONGEST FLOWPATH FROM NODE  40100.00 TO NODE  11927.00 =   10245.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2718.74   24.40    1.975  0.30( 0.30) 1.00    1756.5   40120.00
      2     2743.23   26.21    1.891  0.30( 0.30) 1.00    1871.4   40100.00
      3     2841.58   55.18    1.262  0.30( 0.30) 1.00    3219.6   11900.00
      4     2835.43   55.45    1.259  0.30( 0.30) 1.00    3224.2   11910.00
    TOTAL AREA(ACRES) =      3224.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2841.58  Tc(MIN.) =   55.180
  EFFECTIVE AREA(ACRES) =   3219.56  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3224.2
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    399.00  DOWNSTREAM(FEET) =    384.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   986.26   CHANNEL SLOPE =  0.0152
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.99
 CHANNEL FLOW THRU SUBAREA(CFS) =    2841.58
 FLOW VELOCITY(FEET/SEC.) =   9.49   FLOW DEPTH(FEET) =   9.99
 TRAVEL TIME(MIN.) =   1.73   Tc(MIN.) =   56.91
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610402X.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       79.39   13.47  0.30( 0.30) 1.00      33.3   40200.00
   TOTAL AREA(ACRES) =       33.3

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2718.74   26.15    1.893  0.30( 0.30) 1.00    1756.5   40120.00
     2     2743.23   27.95    1.823  0.30( 0.30) 1.00    1871.4   40100.00
     3     2841.58   56.91    1.245  0.30( 0.30) 1.00    3219.6   11900.00
     4     2835.43   57.18    1.242  0.30( 0.30) 1.00    3224.2   11910.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       79.39   13.47    2.949  0.30( 0.30) 1.00      33.3   40200.00
 LONGEST FLOWPATH FROM NODE  40200.00 TO NODE  11927.50 =    1999.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2407.13   13.47    2.949  0.30( 0.30) 1.00     938.2   40200.00
     2     2766.51   26.15    1.893  0.30( 0.30) 1.00    1789.8   40120.00
     3     2788.89   27.95    1.823  0.30( 0.30) 1.00    1904.7   40100.00
     4     2869.89   56.91    1.245  0.30( 0.30) 1.00    3252.9   11900.00
     5     2863.66   57.18    1.242  0.30( 0.30) 1.00    3257.5   11910.00
   TOTAL AREA(ACRES) =      3257.5
```



```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     2869.89  Tc(MIN.) =   56.913
 EFFECTIVE AREA(ACRES) =   3252.87  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3257.5
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11928.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    384.00  DOWNSTREAM(FEET) =    359.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   647.19   CHANNEL SLOPE =  0.0386
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.17
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.237
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       78.01      0.30     0.984     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2902.94
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.50
 AVERAGE FLOW DEPTH(FEET) =   8.17   TRAVEL TIME(MIN.) =   0.80
 Tc(MIN.) =   57.71
 SUBAREA AREA(ACRES) =    78.01       SUBAREA RUNOFF(CFS) =   66.10
 EFFECTIVE AREA(ACRES) =   3330.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3335.5          PEAK FLOW RATE(CFS) =    2869.89
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.12

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.12   FLOW VELOCITY(FEET/SEC.) =  13.47
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11928.00 =   29360.61 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    359.00  DOWNSTREAM(FEET) =    341.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1322.66   CHANNEL SLOPE =  0.0131
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.37
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.213
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -        8.18      0.30     0.890     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2873.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.01
  AVERAGE FLOW DEPTH(FEET) =  10.37   TRAVEL TIME(MIN.) =   2.45
  Tc(MIN.) =   60.16
  SUBAREA AREA(ACRES) =     8.18       SUBAREA RUNOFF(CFS) =    6.96
  EFFECTIVE AREA(ACRES) =   3339.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3343.7         PEAK FLOW RATE(CFS) =    2869.89
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.37   FLOW VELOCITY(FEET/SEC.) =   9.01
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11929.00 =   30683.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  11527.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  12527.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S18.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    18857.19   37.78  0.30( 0.30) 1.00    7696.9   11831.00
      2    19164.00   40.18  0.30( 0.30) 1.00    8206.2   11801.00
      3    20857.89   51.52  0.30( 0.30) 1.00   11175.6   11530.00
      4    21733.29   56.15  0.30( 0.30) 1.00   12835.7   11701.00
      5    22200.08   58.56  0.30( 0.30) 1.00   13761.3   11000.00
      6    24571.06   68.38  0.30( 0.30) 1.00   18741.8   11330.00
      7    24991.82   70.58  0.30( 0.30) 1.00   19901.5   10800.00
      8    25613.65   74.96  0.30( 0.30) 1.00   22210.7   11130.00
      9    25454.36   83.56  0.30( 0.30) 1.00   25309.0   11620.00
     10    25384.82   85.79  0.30( 0.30) 1.00   26059.2   11600.00
     11    25264.75   87.44  0.30( 0.30) 1.00   26526.0   10600.00
     12    25051.43   92.79  0.30( 0.30) 1.00   28070.3   11201.00
     13    24727.44   98.42  0.30( 0.30) 1.00   29254.1   10710.00
     14    24566.31  100.41  0.30( 0.30) 1.00   29586.2   10410.00
     15    24072.02  105.10  0.30( 0.30) 1.00   30247.2   10700.00
     16    23355.07  112.09  0.30( 0.30) 1.00   31166.3   10400.00
     17    23164.74  114.41  0.30( 0.30) 1.00   31436.1   10200.00
```



```
     18    22543.01  120.36  0.30( 0.30) 1.00   32015.3   10300.00
     19    21907.27  125.43  0.30( 0.30) 1.00   32220.0   10210.00
     20    19361.93  152.56  0.30( 0.30) 1.00   32916.6   10100.00
    TOTAL AREA(ACRES) =    32916.6

****************************************************************************
  FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================
  ***MEMORY BANK #  2 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
  FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S25.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     6814.50   66.89  0.30( 0.30) 0.99    6391.3   12500.00
      2     7516.29   80.52  0.30( 0.30) 0.99    8363.2   12300.00
      3     7624.15   81.90  0.30( 0.30) 0.98    8651.1   12330.00
      4     7790.13   84.56  0.30( 0.30) 0.98    9163.3   12410.00
      5     7994.80   88.76  0.30( 0.29) 0.98    9893.7   12400.00
      6     8150.71   93.51  0.30( 0.29) 0.98   10583.9   12211.00
      7     8243.64   97.69  0.30( 0.29) 0.98   11179.7   12201.00
      8     8206.30  101.91  0.30( 0.29) 0.98   11654.2   12111.00
      9     8181.35  104.55  0.30( 0.29) 0.98   11966.0   12231.00
     10     8146.02  107.37  0.30( 0.29) 0.98   12265.8   12101.10
     11     8126.24  108.35  0.30( 0.29) 0.98   12357.5   12261.00
     12     7677.07  119.73  0.30( 0.29) 0.98   13113.0   12010.00
     13     7237.60  128.31  0.30( 0.29) 0.98   13237.1   12000.00
    TOTAL AREA(ACRES) =    13237.1

****************************************************************************
  FLOW PROCESS FROM NODE  12526.00 TO NODE  12527.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     6814.50   66.89  0.30( 0.30) 0.99    6391.3   12500.00
      2     7516.29   80.52  0.30( 0.30) 0.99    8363.2   12300.00
      3     7624.15   81.90  0.30( 0.30) 0.98    8651.1   12330.00
      4     7790.13   84.56  0.30( 0.30) 0.98    9163.3   12410.00
      5     7994.80   88.76  0.30( 0.29) 0.98    9893.7   12400.00
      6     8150.71   93.51  0.30( 0.29) 0.98   10583.9   12211.00
      7     8243.64   97.69  0.30( 0.29) 0.98   11179.7   12201.00
      8     8206.30  101.91  0.30( 0.29) 0.98   11654.2   12111.00
      9     8181.35  104.55  0.30( 0.29) 0.98   11966.0   12231.00
     10     8146.02  107.37  0.30( 0.29) 0.98   12265.8   12101.10
     11     8126.24  108.35  0.30( 0.29) 0.98   12357.5   12261.00
     12     7677.07  119.73  0.30( 0.29) 0.98   13113.0   12010.00
     13     7237.60  128.31  0.30( 0.29) 0.98   13237.1   12000.00
```

TOTAL AREA(ACRES) = 13237.1

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	66.89	1.167	0.30(0.30)	0.99	6391.3	12500.00
2	7516.29	80.52	1.074	0.30(0.30)	0.99	8363.2	12300.00
3	7624.15	81.90	1.065	0.30(0.30)	0.98	8651.1	12330.00
4	7790.13	84.56	1.047	0.30(0.30)	0.98	9163.3	12410.00
5	7994.80	88.76	1.018	0.30(0.29)	0.98	9893.7	12400.00
6	8150.71	93.51	0.995	0.30(0.29)	0.98	10583.9	12211.00
7	8243.64	97.69	0.977	0.30(0.29)	0.98	11179.7	12201.00
8	8206.30	101.91	0.958	0.30(0.29)	0.98	11654.2	12111.00
9	8181.35	104.55	0.947	0.30(0.29)	0.98	11966.0	12231.00
10	8146.02	107.37	0.935	0.30(0.29)	0.98	12265.8	12101.10
11	8126.24	108.35	0.930	0.30(0.29)	0.98	12357.5	12261.00
12	7677.07	119.73	0.881	0.30(0.29)	0.98	13113.0	12010.00
13	7237.60	128.31	0.863	0.30(0.29)	0.98	13237.1	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18857.19	37.78	1.535	0.30(0.30)	1.00	7696.9	11831.00
2	19164.00	40.18	1.472	0.30(0.30)	1.00	8206.2	11801.00
3	20857.89	51.52	1.298	0.30(0.30)	1.00	11175.6	11530.00
4	21733.29	56.15	1.252	0.30(0.30)	1.00	12835.7	11701.00
5	22200.08	58.56	1.228	0.30(0.30)	1.00	13761.3	11000.00
6	24571.06	68.38	1.157	0.30(0.30)	1.00	18741.8	11330.00
7	24991.82	70.58	1.142	0.30(0.30)	1.00	19901.5	10800.00
8	25613.65	74.96	1.112	0.30(0.30)	1.00	22210.7	11130.00
9	25454.36	83.56	1.054	0.30(0.30)	1.00	25309.0	11620.00
10	25384.82	85.79	1.039	0.30(0.30)	1.00	26059.2	11600.00
11	25264.75	87.44	1.027	0.30(0.30)	1.00	26526.0	10600.00
12	25051.43	92.79	0.998	0.30(0.30)	1.00	28070.3	11201.00
13	24727.44	98.42	0.974	0.30(0.30)	1.00	29254.1	10710.00
14	24566.31	100.41	0.965	0.30(0.30)	1.00	29586.2	10410.00
15	24072.02	105.10	0.945	0.30(0.30)	1.00	30247.2	10700.00
16	23355.07	112.09	0.914	0.30(0.30)	1.00	31166.3	10400.00
17	23164.74	114.41	0.904	0.30(0.30)	1.00	31436.1	10200.00
18	22543.01	120.36	0.879	0.30(0.30)	1.00	32015.3	10300.00
19	21907.27	125.43	0.869	0.30(0.30)	1.00	32220.0	10210.00
20	19361.93	152.56	0.815	0.30(0.30)	1.00	32916.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24329.79	37.78	1.535	0.30(0.30)	0.99	11306.6	11831.00
2	24690.32	40.18	1.472	0.30(0.30)	0.99	12045.7	11801.00
3	26894.55	51.52	1.298	0.30(0.30)	0.99	16098.3	11530.00
4	28011.54	56.15	1.252	0.30(0.30)	0.99	18200.8	11701.00
5	28584.42	58.56	1.228	0.30(0.30)	0.99	19356.8	11000.00
6	31026.95	66.89	1.167	0.30(0.30)	0.99	24379.8	12500.00
7	31462.02	68.38	1.157	0.30(0.30)	0.99	25347.9	11330.00
8	31996.52	70.58	1.142	0.30(0.30)	0.99	26827.2	10800.00
9	32843.79	74.96	1.112	0.30(0.30)	0.99	29769.9	11130.00
10	33027.03	80.52	1.074	0.30(0.30)	0.99	32575.4	12300.00
11	33109.33	81.90	1.065	0.30(0.30)	0.99	33360.6	12330.00
12	33182.19	83.56	1.054	0.30(0.30)	0.99	34280.0	11620.00
13	33213.31	84.56	1.047	0.30(0.30)	0.99	34808.6	12410.00
14	33234.97	85.79	1.039	0.30(0.30)	0.99	35436.7	11600.00
15	33195.18	87.44	1.027	0.30(0.30)	0.99	36190.1	10600.00
16	33206.99	88.76	1.018	0.30(0.30)	0.99	36800.3	12400.00
17	33178.75	92.79	0.998	0.30(0.30)	0.99	38550.8	11201.00
18	33161.16	93.51	0.995	0.30(0.30)	0.99	38803.9	12211.00
19	33013.05	97.69	0.977	0.30(0.30)	0.99	40280.5	12201.00
20	32964.63	98.42	0.974	0.30(0.30)	0.99	40515.8	10710.00
21	32785.95	100.41	0.965	0.30(0.30)	0.99	41071.0	10410.00
22	32613.72	101.91	0.958	0.30(0.30)	0.99	41452.9	12111.00
23	32311.17	104.55	0.947	0.30(0.30)	0.99	42135.8	12231.00
24	32246.51	105.10	0.945	0.30(0.30)	0.99	42271.3	10700.00
25	31984.73	107.37	0.935	0.30(0.30)	0.99	42812.1	12101.10
26	31865.02	108.35	0.930	0.30(0.30)	0.99	43031.8	12261.00
27	31333.58	112.09	0.914	0.30(0.30)	0.99	43772.2	10400.00
28	31051.69	114.41	0.904	0.30(0.30)	0.99	44196.0	10200.00
29	30286.21	119.73	0.881	0.30(0.30)	0.99	45066.8	12010.00
30	30187.65	120.36	0.879	0.30(0.30)	0.99	45137.5	10300.00
31	29292.29	125.43	0.869	0.30(0.30)	0.99	45415.5	10210.00
32	28874.95	128.31	0.863	0.30(0.30)	0.99	45530.9	12000.00
33	25983.19	152.56	0.815	0.30(0.30)	0.99	46153.7	10100.00

TOTAL AREA(ACRES) = 46153.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 33234.97 Tc(MIN.) = 85.793
EFFECTIVE AREA(ACRES) = 35436.66 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46153.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

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FLOW PROCESS FROM NODE 12527.00 TO NODE 11929.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 347.47 DOWNSTREAM(FEET) = 341.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 532.38 CHANNEL SLOPE = 0.0110
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.03
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.035
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.37	0.30	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33239.75
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.01

AVERAGE FLOW DEPTH(FEET) = 9.03 TRAVEL TIME(MIN.) = 0.59
Tc(MIN.) = 86.38
SUBAREA AREA(ACRES) = 14.37 SUBAREA RUNOFF(CFS) = 9.55
EFFECTIVE AREA(ACRES) = 35451.04 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46168.0 PEAK FLOW RATE(CFS) = 33234.97
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.03 FLOW VELOCITY(FEET/SEC.) = 15.01
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

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FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24329.79	38.43	1.517	0.30(0.30)	0.99	11320.9	11831.00
2	24690.32	40.84	1.461	0.30(0.30)	0.99	12060.1	11801.00
3	26894.55	52.15	1.292	0.30(0.30)	0.99	16112.6	11530.00
4	28011.54	56.78	1.246	0.30(0.30)	0.99	18215.2	11701.00
5	28584.42	59.18	1.222	0.30(0.30)	0.99	19371.1	11000.00
6	31026.95	67.50	1.163	0.30(0.30)	0.99	24394.2	12500.00
7	31462.02	68.98	1.153	0.30(0.30)	0.99	25362.3	11330.00
8	31996.52	71.18	1.138	0.30(0.30)	0.99	26841.5	10800.00
9	32843.79	75.55	1.108	0.30(0.30)	0.99	29784.3	11130.00
10	33027.03	81.11	1.070	0.30(0.30)	0.99	32589.8	12300.00
11	33109.33	82.49	1.061	0.30(0.30)	0.99	33374.9	12330.00
12	33182.19	84.15	1.050	0.30(0.30)	0.99	34294.4	11620.00
13	33213.31	85.15	1.043	0.30(0.30)	0.99	34823.0	12410.00
14	33234.97	86.38	1.035	0.30(0.30)	0.99	35451.0	11600.00
15	33195.18	88.03	1.023	0.30(0.30)	0.99	36204.4	10600.00
16	33206.99	89.35	1.014	0.30(0.30)	0.99	36814.7	12400.00
17	33178.75	93.38	0.995	0.30(0.30)	0.99	38565.1	11201.00
18	33161.16	94.10	0.992	0.30(0.30)	0.99	38818.3	12211.00
19	33013.05	98.29	0.974	0.30(0.30)	0.99	40294.8	12201.00
20	32964.63	99.02	0.971	0.30(0.30)	0.99	40530.1	10710.00
21	32785.95	101.00	0.962	0.30(0.30)	0.99	41085.3	10410.00
22	32613.72	102.51	0.956	0.30(0.30)	0.99	41467.2	12111.00
23	32311.17	105.14	0.944	0.30(0.30)	0.99	42150.2	12231.00
24	32246.51	105.69	0.942	0.30(0.30)	0.99	42285.7	10700.00
25	31984.73	107.97	0.932	0.30(0.30)	0.99	42826.5	12101.10
26	31865.02	108.95	0.928	0.30(0.30)	0.99	43046.2	12261.00
27	31333.58	112.69	0.912	0.30(0.30)	0.99	43786.6	10400.00
28	31051.69	115.02	0.902	0.30(0.30)	0.99	44210.4	10200.00
29	30286.21	120.34	0.879	0.30(0.30)	0.99	45081.1	12010.00
30	30187.65	120.97	0.878	0.30(0.30)	0.99	45151.9	10300.00
31	29292.29	126.05	0.868	0.30(0.30)	0.99	45429.8	10210.00
32	28874.95	128.93	0.862	0.30(0.30)	0.99	45545.3	12000.00
33	25983.19	153.21	0.814	0.30(0.30)	0.99	46168.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2407.13	16.86	2.527	0.30(0.30)	1.00	1024.4	40200.00
2	2766.51	29.42	1.766	0.30(0.30)	1.00	1876.0	40120.00
3	2788.89	31.22	1.711	0.30(0.30)	1.00	1990.9	40100.00
4	2869.89	60.16	1.213	0.30(0.30)	1.00	3339.1	11900.00
5	2863.66	60.43	1.211	0.30(0.30)	1.00	3343.7	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21915.10	16.86	2.527	0.30(0.30)	0.99	5989.8	40200.00
2	25199.21	29.42	1.766	0.30(0.30)	0.99	10542.6	40120.00
3	25697.26	31.22	1.711	0.30(0.30)	0.99	11187.2	40100.00
4	27138.87	38.43	1.517	0.30(0.30)	0.99	13647.9	11831.00
5	27506.13	40.84	1.461	0.30(0.30)	0.99	14499.0	11801.00
6	29742.04	52.15	1.292	0.30(0.30)	0.99	19078.8	11530.00
7	30871.96	56.78	1.246	0.30(0.30)	0.99	21396.8	11701.00
8	31451.58	59.18	1.222	0.30(0.30)	0.99	22664.8	11000.00
9	31740.97	60.16	1.213	0.30(0.30)	0.99	23299.7	11900.00
10	31813.21	60.43	1.211	0.30(0.30)	0.99	23465.7	11910.00
11	33739.66	67.50	1.163	0.30(0.30)	0.99	27737.9	12500.00
12	34143.09	68.98	1.153	0.30(0.30)	0.99	28706.0	11330.00
13	34630.52	71.18	1.138	0.30(0.30)	0.99	30185.2	10800.00
14	35384.44	75.55	1.108	0.30(0.30)	0.99	33128.0	11130.00
15	35449.07	81.11	1.070	0.30(0.30)	0.99	35933.5	12300.00
16	35501.91	82.49	1.061	0.30(0.30)	0.99	36718.7	12330.00
17	35539.25	84.15	1.050	0.30(0.30)	0.99	37638.1	11620.00
18	35549.02	85.15	1.043	0.30(0.30)	0.99	38166.7	12410.00
19	35544.41	86.38	1.035	0.30(0.30)	0.99	38794.8	11600.00
20	35469.49	88.03	1.023	0.30(0.30)	0.99	39548.1	10600.00
21	35453.12	89.35	1.014	0.30(0.30)	0.99	40158.4	12400.00
22	35364.94	93.38	0.995	0.30(0.30)	0.99	41908.8	11201.00
23	35337.66	94.10	0.992	0.30(0.30)	0.99	42162.0	12211.00
24	35132.55	98.29	0.974	0.30(0.30)	0.99	43638.6	12201.00
25	35074.21	99.02	0.971	0.30(0.30)	0.99	43873.9	10710.00
26	34868.52	101.00	0.962	0.30(0.30)	0.99	44429.0	10410.00
27	34675.77	102.51	0.956	0.30(0.30)	0.99	44811.0	12111.00
28	34337.37	105.14	0.944	0.30(0.30)	0.99	45493.9	12231.00
29	34265.25	105.69	0.942	0.30(0.30)	0.99	45629.4	10700.00
30	33972.47	107.97	0.932	0.30(0.30)	0.99	46170.2	12101.10
31	33839.48	108.95	0.928	0.30(0.30)	0.99	46389.9	12261.00
32	33257.06	112.69	0.912	0.30(0.30)	0.99	47130.3	10400.00
33	32943.58	115.02	0.902	0.30(0.30)	0.99	47554.1	10200.00
34	32108.15	120.34	0.879	0.30(0.30)	0.99	48424.9	12010.00
35	32005.61	120.97	0.878	0.30(0.30)	0.99	48495.6	10300.00
36	31078.39	126.05	0.868	0.30(0.30)	0.99	48773.5	10210.00
37	30642.96	128.93	0.862	0.30(0.30)	0.99	48889.0	12000.00
38	27598.74	153.21	0.814	0.30(0.30)	0.99	49511.8	10100.00

TOTAL AREA(ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 35549.02 Tc(MIN.) = 85.154
EFFECTIVE AREA(ACRES) = 38166.73 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 49511.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 49511.8 TC(MIN.) = 85.15
EFFECTIVE AREA(ACRES) = 38166.73 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994
PEAK FLOW RATE(CFS) = 35549.02

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21915.10	16.86	2.527	0.30(0.30)	0.99	5989.8	40200.00
2	25199.21	29.42	1.766	0.30(0.30)	0.99	10542.6	40120.00
3	25697.26	31.22	1.711	0.30(0.30)	0.99	11187.2	40100.00
4	27138.87	38.43	1.517	0.30(0.30)	0.99	13647.9	11831.00
5	27506.13	40.84	1.461	0.30(0.30)	0.99	14499.0	11801.00
6	29742.04	52.15	1.292	0.30(0.30)	0.99	19078.8	11530.00
7	30871.96	56.78	1.246	0.30(0.30)	0.99	21396.8	11701.00
8	31451.58	59.18	1.222	0.30(0.30)	0.99	22664.8	11000.00
9	31740.97	60.16	1.213	0.30(0.30)	0.99	23299.7	11900.00
10	31813.21	60.43	1.211	0.30(0.30)	0.99	23465.7	11910.00
11	33739.66	67.50	1.163	0.30(0.30)	0.99	27737.9	12500.00
12	34143.09	68.98	1.153	0.30(0.30)	0.99	28706.0	11330.00
13	34630.52	71.18	1.138	0.30(0.30)	0.99	30185.2	10800.00
14	35384.44	75.55	1.108	0.30(0.30)	0.99	33128.0	11130.00
15	35449.07	81.11	1.070	0.30(0.30)	0.99	35933.5	12300.00
16	35501.91	82.49	1.061	0.30(0.30)	0.99	36718.7	12330.00
17	35539.25	84.15	1.050	0.30(0.30)	0.99	37638.1	11620.00
18	35549.02	85.15	1.043	0.30(0.30)	0.99	38166.7	12410.00
19	35544.41	86.38	1.035	0.30(0.30)	0.99	38794.8	11600.00
20	35469.49	88.03	1.023	0.30(0.30)	0.99	39548.1	10600.00
21	35453.12	89.35	1.014	0.30(0.30)	0.99	40158.4	12400.00
22	35364.94	93.38	0.995	0.30(0.30)	0.99	41908.8	11201.00
23	35337.66	94.10	0.992	0.30(0.30)	0.99	42162.0	12211.00
24	35132.55	98.29	0.974	0.30(0.30)	0.99	43638.6	12201.00
25	35074.21	99.02	0.971	0.30(0.30)	0.99	43873.9	10710.00
26	34868.52	101.00	0.962	0.30(0.30)	0.99	44429.0	10410.00
27	34675.77	102.51	0.956	0.30(0.30)	0.99	44811.0	12111.00
28	34337.37	105.14	0.944	0.30(0.30)	0.99	45493.9	12231.00
29	34265.25	105.69	0.942	0.30(0.30)	0.99	45629.4	10700.00
30	33972.47	107.97	0.932	0.30(0.30)	0.99	46170.2	12101.10
31	33839.48	108.95	0.928	0.30(0.30)	0.99	46389.9	12261.00
32	33257.06	112.69	0.912	0.30(0.30)	0.99	47130.3	10400.00
33	32943.58	115.02	0.902	0.30(0.30)	0.99	47554.1	10200.00
34	32108.15	120.34	0.879	0.30(0.30)	0.99	48424.9	12010.00
35	32005.61	120.97	0.878	0.30(0.30)	0.99	48495.6	10300.00
36	31078.39	126.05	0.868	0.30(0.30)	0.99	48773.5	10210.00
37	30642.96	128.93	0.862	0.30(0.30)	0.99	48889.0	12000.00
38	27598.74	153.21	0.814	0.30(0.30)	0.99	49511.8	10100.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:
```

```
------------------------------------------------------------------------
  FILE NAME: S20.DAT
  TIME/DATE OF STUDY: 11:58 04/03/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.059
   2)   10.00;  3.304
   3)   15.00;  2.561
   4)   20.00;  2.152
   5)   25.00;  1.872
   6)   30.00;  1.681
   7)   40.00;  1.428
   8)   50.00;  1.266
   9)   60.00;  1.147
  10)   90.00;  0.946
  11)  120.00;  0.816
  12)  180.00;  0.687
  13)  360.00;  0.499
  14) 1440.00;  0.216
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  12000.00 TO NODE  12001.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   965.01
  ELEVATION DATA: UPSTREAM(FEET) =   4506.20  DOWNSTREAM(FEET) =   4179.61

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.700
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.754
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        9.03      0.30     1.000     0   13.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     19.95
  TOTAL AREA(ACRES) =      9.03   PEAK FLOW RATE(CFS) =     19.95

************************************************************************
  FLOW PROCESS FROM NODE  12001.00 TO NODE  12002.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4179.61  DOWNSTREAM(FEET) =   3849.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.60   CHANNEL SLOPE =  0.3380
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.499
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.92
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   2.05
  Tc(MIN.) =   15.76
  SUBAREA AREA(ACRES) =    18.82       SUBAREA RUNOFF(CFS) =   37.25
  EFFECTIVE AREA(ACRES) =     27.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.8          PEAK FLOW RATE(CFS) =      55.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   8.99
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12002.00 =    1941.61 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  12002.00 TO NODE  12003.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3849.51  DOWNSTREAM(FEET) =   3265.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1892.03   CHANNEL SLOPE =  0.3086
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.270
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     116.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.24
  AVERAGE FLOW DEPTH(FEET) =   0.88   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   18.56
  SUBAREA AREA(ACRES) =    68.96       SUBAREA RUNOFF(CFS) =  122.26
  EFFECTIVE AREA(ACRES) =     96.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       96.8         PEAK FLOW RATE(CFS) =     171.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =  12.85
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12003.00 =    3833.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3265.69  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3118.62   CHANNEL SLOPE =  0.2688
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.99
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.054
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     431.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.25
  AVERAGE FLOW DEPTH(FEET) =   1.92   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   21.76
  SUBAREA AREA(ACRES) =   328.28       SUBAREA RUNOFF(CFS) =  518.12
  EFFECTIVE AREA(ACRES) =    425.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      425.1         PEAK FLOW RATE(CFS) =     670.91
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.44   FLOW VELOCITY(FEET/SEC.) =  18.51
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.76
  RAINFALL INTENSITY(INCH/HR) =   2.05
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     425.09
  TOTAL STREAM AREA(ACRES) =     425.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     670.91

****************************************************************************
  FLOW PROCESS FROM NODE  12010.00 TO NODE  12011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   264.80
  ELEVATION DATA: UPSTREAM(FEET) =   4208.12  DOWNSTREAM(FEET) =   4068.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.470
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.192
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.06      0.30     1.000     0    7.47
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.22
  TOTAL AREA(ACRES) =      2.06   PEAK FLOW RATE(CFS) =      7.22

****************************************************************************
  FLOW PROCESS FROM NODE  12011.00 TO NODE  12012.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4068.13  DOWNSTREAM(FEET) =   3694.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.45   CHANNEL SLOPE =  0.5703
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.21
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.581
```

```
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        3.98      0.30      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.12
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.27
 AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   1.74
 Tc(MIN.) =    9.21
 SUBAREA AREA(ACRES) =     3.98       SUBAREA RUNOFF(CFS) =   11.75
 EFFECTIVE AREA(ACRES) =      6.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      17.84
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   7.05
 LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12012.00 =     919.25 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12012.00 TO NODE  12013.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3694.92  DOWNSTREAM(FEET) =   3415.55
 CHANNEL LENGTH THRU SUBAREA(FEET) =   981.94   CHANNEL SLOPE =  0.2845
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.67
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.150
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       35.56      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.96
 AVERAGE FLOW DEPTH(FEET) =   0.63   TRAVEL TIME(MIN.) =   1.83
 Tc(MIN.) =   11.04
 SUBAREA AREA(ACRES) =    35.56       SUBAREA RUNOFF(CFS) =   91.21
 EFFECTIVE AREA(ACRES) =     41.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       41.6         PEAK FLOW RATE(CFS) =     106.70
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =  10.62
 LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12013.00 =    1901.19 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12013.00 TO NODE  12014.00 IS CODE =  56
```



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----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3415.55  DOWNSTREAM(FEET) =   2756.62
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.68   CHANNEL SLOPE =  0.3420
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.801
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       72.40      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     188.40
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.68
 AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   2.35
 Tc(MIN.) =   13.38
 SUBAREA AREA(ACRES) =    72.40       SUBAREA RUNOFF(CFS) =  162.98
 EFFECTIVE AREA(ACRES) =    114.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      114.0         PEAK FLOW RATE(CFS) =     256.62
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.34

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.34   FLOW VELOCITY(FEET/SEC.) =  15.10
 LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12014.00 =    3827.87 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2756.62  DOWNSTREAM(FEET) =   2427.28
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1697.28   CHANNEL SLOPE =  0.1940
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.99
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.528
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      121.96      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     378.98
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.98
 AVERAGE FLOW DEPTH(FEET) =   1.95   TRAVEL TIME(MIN.) =   2.02
 Tc(MIN.) =   15.41
 SUBAREA AREA(ACRES) =   121.96       SUBAREA RUNOFF(CFS) =  244.52
 EFFECTIVE AREA(ACRES) =    235.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      236.0         PEAK FLOW RATE(CFS) =     473.09
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.20   FLOW VELOCITY(FEET/SEC.) =  14.92
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12020.00 =    5525.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.41
  RAINFALL INTENSITY(INCH/HR) =   2.53
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     235.96
  TOTAL STREAM AREA(ACRES) =     235.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     473.09

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      670.91   21.76    2.054  0.30( 0.30) 1.00     425.1   12000.00
      2      473.09   15.41    2.528  0.30( 0.30) 1.00     236.0   12010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1076.64   15.41    2.528  0.30( 0.30) 1.00     537.0   12010.00
      2     1043.33   21.76    2.054  0.30( 0.30) 1.00     661.0   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1076.64    Tc(MIN.) =    15.41
  EFFECTIVE AREA(ACRES) =     536.99   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      661.0
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12020.00 TO NODE  12021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2427.28  DOWNSTREAM(FEET) =   2056.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2698.04   CHANNEL SLOPE =  0.1375
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.32
```



```
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.322
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      376.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1419.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.89
  AVERAGE FLOW DEPTH(FEET) =   4.28   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   17.92
  SUBAREA AREA(ACRES) =   376.13       SUBAREA RUNOFF(CFS) =  684.54
  EFFECTIVE AREA(ACRES) =    913.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1037.2          PEAK FLOW RATE(CFS) =    1661.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.62   FLOW VELOCITY(FEET/SEC.) =  18.69
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12021.00 =    9650.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12021.00 TO NODE  12022.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2056.25  DOWNSTREAM(FEET) =   1864.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2552.86   CHANNEL SLOPE =  0.0750
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.83
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.116
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      347.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1945.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.58
  AVERAGE FLOW DEPTH(FEET) =   5.79   TRAVEL TIME(MIN.) =   2.73
  Tc(MIN.) =   20.65
  SUBAREA AREA(ACRES) =   347.45       SUBAREA RUNOFF(CFS) =  567.75
  EFFECTIVE AREA(ACRES) =   1260.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1384.6          PEAK FLOW RATE(CFS) =    2059.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.95   FLOW VELOCITY(FEET/SEC.) =  15.82
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12022.00 =   12203.16 FEET.

****************************************************************************
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```
 FLOW PROCESS FROM NODE  12022.00 TO NODE  12023.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1864.68  DOWNSTREAM(FEET) =   1710.75
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.57   CHANNEL SLOPE =  0.0816
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.13
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.010
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      280.70      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2275.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.74
 AVERAGE FLOW DEPTH(FEET) =   6.12   TRAVEL TIME(MIN.) =   1.88
 Tc(MIN.) =   22.53
 SUBAREA AREA(ACRES) =   280.70       SUBAREA RUNOFF(CFS) =  432.10
 EFFECTIVE AREA(ACRES) =   1541.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1665.3         PEAK FLOW RATE(CFS) =    2372.58
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.24

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.24   FLOW VELOCITY(FEET/SEC.) =  16.92
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12023.00 =   14089.73 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1710.75  DOWNSTREAM(FEET) =   1672.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.87   CHANNEL SLOPE =  0.0196
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.01
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.844
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      248.35      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2545.20
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.15
 AVERAGE FLOW DEPTH(FEET) =   8.98   TRAVEL TIME(MIN.) =   3.19
 Tc(MIN.) =   25.72
 SUBAREA AREA(ACRES) =   248.35       SUBAREA RUNOFF(CFS) =  345.20
 EFFECTIVE AREA(ACRES) =   1789.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1913.7         PEAK FLOW RATE(CFS) =    2487.49
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.88

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.88   FLOW VELOCITY(FEET/SEC.) =  10.08
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12024.00 =   16034.60 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1913.7  TC(MIN.) =     25.72
 EFFECTIVE AREA(ACRES) =   1789.62  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =    2487.49

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2487.49   25.72    1.844  0.30( 0.30) 1.00    1789.6   12010.00
     2     2275.95   32.36    1.621  0.30( 0.30) 1.00    1913.7   12000.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S21.DAT
  TIME/DATE OF STUDY: 11:58 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.059
   2)   10.00;  3.304
   3)   15.00;  2.561
   4)   20.00;  2.152
   5)   25.00;  1.872
   6)   30.00;  1.681
   7)   40.00;  1.428
   8)   50.00;  1.266
   9)   60.00;  1.147
  10)   90.00;  0.946
  11)  120.00;  0.816
  12)  180.00;  0.687
  13)  360.00;  0.499
  14) 1440.00;  0.216
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S20.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1     2487.49   25.72  0.30( 0.30) 1.00    1789.6   12010.00
      2     2275.95   32.36  0.30( 0.30) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =     1913.7

**************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1     2487.49   25.72  0.30( 0.30) 1.00    1789.6   12010.00
      2     2275.95   32.36  0.30( 0.30) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =      1913.7

**************************************************************************
  FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1672.60  DOWNSTREAM(FEET) =   1636.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   780.49   CHANNEL SLOPE =  0.0458
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.40
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.809
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       93.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2550.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.93
  AVERAGE FLOW DEPTH(FEET) =   7.39   TRAVEL TIME(MIN.) =   0.93
  Tc(MIN.) =   26.66
  SUBAREA AREA(ACRES) =    93.19       SUBAREA RUNOFF(CFS) =  126.54
  EFFECTIVE AREA(ACRES) =   1882.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.9         PEAK FLOW RATE(CFS) =    2556.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.40   FLOW VELOCITY(FEET/SEC.) =  13.94
```

```
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   26.66
 RAINFALL INTENSITY(INCH/HR) =   1.81
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    1882.81
 TOTAL STREAM AREA(ACRES) =    2006.87
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    2556.57

****************************************************************************
 FLOW PROCESS FROM NODE  12101.10 TO NODE  12101.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   847.57
 ELEVATION DATA: UPSTREAM(FEET) =   3435.00  DOWNSTREAM(FEET) =   2774.23

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.008
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.154
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        6.56      0.30     1.000     0   11.01
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     16.85
 TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =     16.85

****************************************************************************
 FLOW PROCESS FROM NODE  12101.20 TO NODE  12101.30 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2774.23  DOWNSTREAM(FEET) =   2097.09
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1205.19   CHANNEL SLOPE =  0.5619
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.51
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.877
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       34.88      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



```
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.40
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.78
 AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   1.86
 Tc(MIN.) =   12.87
 SUBAREA AREA(ACRES) =    34.88       SUBAREA RUNOFF(CFS) =   80.91
 EFFECTIVE AREA(ACRES) =     41.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       41.4          PEAK FLOW RATE(CFS) =      96.13
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.66

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =  12.85
 LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12101.30 =    2052.76 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2097.09  DOWNSTREAM(FEET) =   1636.82
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1553.74   CHANNEL SLOPE =  0.2962
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.562
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       56.40      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     153.66
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.20
 AVERAGE FLOW DEPTH(FEET) =   1.04   TRAVEL TIME(MIN.) =   2.12
 Tc(MIN.) =   14.99
 SUBAREA AREA(ACRES) =    56.40       SUBAREA RUNOFF(CFS) =  114.81
 EFFECTIVE AREA(ACRES) =     97.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       97.8          PEAK FLOW RATE(CFS) =     199.18
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.21

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.21   FLOW VELOCITY(FEET/SEC.) =  13.25
 LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12102.00 =    3606.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =   14.99
 RAINFALL INTENSITY(INCH/HR) =   2.56
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =      97.84
 TOTAL STREAM AREA(ACRES) =      97.84
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     199.18

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2556.57   26.66    1.809  0.30( 0.30) 1.00    1882.8   12010.00
     1     2343.10   33.31    1.597  0.30( 0.30) 1.00    2006.9   12000.00
     2      199.18   14.99    2.562  0.30( 0.30) 1.00      97.8   12101.10

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2355.03   14.99    2.562  0.30( 0.30) 1.00    1156.9   12101.10
     2     2689.42   26.66    1.809  0.30( 0.30) 1.00    1980.6   12010.00
     3     2457.33   33.31    1.597  0.30( 0.30) 1.00    2104.7   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    2689.42    Tc(MIN.) =    26.66
 EFFECTIVE AREA(ACRES) =    1980.65   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     2104.7
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12102.00 TO NODE  12103.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1636.82  DOWNSTREAM(FEET) =   1558.46
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2049.75   CHANNEL SLOPE =  0.0382
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.01
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.710
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      116.59      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2763.43
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.28
 AVERAGE FLOW DEPTH(FEET) =   8.00   TRAVEL TIME(MIN.) =   2.57
 Tc(MIN.) =   29.23
 SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =  148.00
 EFFECTIVE AREA(ACRES) =   2097.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     2221.3         PEAK FLOW RATE(CFS) =    2689.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.90

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.90   FLOW VELOCITY(FEET/SEC.) =  13.19
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12103.00 =   18864.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12103.00 TO NODE  12104.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1558.46  DOWNSTREAM(FEET) =   1453.87
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1971.34   CHANNEL SLOPE =  0.0531
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.60
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.646
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      355.30      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2904.62
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.20
 AVERAGE FLOW DEPTH(FEET) =   7.59   TRAVEL TIME(MIN.) =   2.16
 Tc(MIN.) =   31.39
 SUBAREA AREA(ACRES) =   355.30       SUBAREA RUNOFF(CFS) =  430.37
 EFFECTIVE AREA(ACRES) =   2452.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2576.6         PEAK FLOW RATE(CFS) =    2970.74
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.67

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.67   FLOW VELOCITY(FEET/SEC.) =  15.28
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12104.00 =   20836.18 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12104.00 TO NODE  12105.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1453.87  DOWNSTREAM(FEET) =   1369.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1885.63   CHANNEL SLOPE =  0.0446
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.13
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.591
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      200.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3087.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.48
  AVERAGE FLOW DEPTH(FEET) =   8.12   TRAVEL TIME(MIN.) =   2.17
  Tc(MIN.) =   33.56
  SUBAREA AREA(ACRES) =   200.37       SUBAREA RUNOFF(CFS) =  232.81
  EFFECTIVE AREA(ACRES) =   2652.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2777.0         PEAK FLOW RATE(CFS) =    3082.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.12   FLOW VELOCITY(FEET/SEC.) =  14.46
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12105.00 =   22721.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12105.00 TO NODE  12106.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1369.72  DOWNSTREAM(FEET) =   1298.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1910.12   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.69
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.532
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3270.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.76
  AVERAGE FLOW DEPTH(FEET) =   8.69   TRAVEL TIME(MIN.) =   2.31
  Tc(MIN.) =   35.87
  SUBAREA AREA(ACRES) =   339.52       SUBAREA RUNOFF(CFS) =  376.59
  EFFECTIVE AREA(ACRES) =   2992.43     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3116.5         PEAK FLOW RATE(CFS) =    3319.18
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.75   FLOW VELOCITY(FEET/SEC.) =  13.80
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12106.00 =   24631.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1298.29  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2982.44   CHANNEL SLOPE =  0.0277
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.48
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.431
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      164.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3403.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.43
  AVERAGE FLOW DEPTH(FEET) =   9.47   TRAVEL TIME(MIN.) =   4.00
  Tc(MIN.) =   39.87
  SUBAREA AREA(ACRES) =   164.97       SUBAREA RUNOFF(CFS) =  167.96
  EFFECTIVE AREA(ACRES) =   3157.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3281.5         PEAK FLOW RATE(CFS) =    3319.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.36   FLOW VELOCITY(FEET/SEC.) =  12.34
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   39.87
  RAINFALL INTENSITY(INCH/HR) =   1.43
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3157.40
  TOTAL STREAM AREA(ACRES) =    3281.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    3319.18

****************************************************************************
  FLOW PROCESS FROM NODE  12111.00 TO NODE  12112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   939.51
  ELEVATION DATA: UPSTREAM(FEET) =   3108.05  DOWNSTREAM(FEET) =   2753.95

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.265
```

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 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.819
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,BROADLEAF"       -        8.25      0.30     1.000     0   13.27
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     18.70
 TOTAL AREA(ACRES) =      8.25   PEAK FLOW RATE(CFS) =     18.70

****************************************************************************
 FLOW PROCESS FROM NODE  12112.00 TO NODE  12113.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2753.95  DOWNSTREAM(FEET) =   2458.45
 CHANNEL LENGTH THRU SUBAREA(FEET) =   945.14   CHANNEL SLOPE =  0.3127
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.529
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       16.51      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.41
 AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   2.12
 Tc(MIN.) =   15.39
 SUBAREA AREA(ACRES) =    16.51       SUBAREA RUNOFF(CFS) =   33.12
 EFFECTIVE AREA(ACRES) =     24.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       24.8         PEAK FLOW RATE(CFS) =      49.67
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.53

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =   8.45
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12113.00 =    1884.65 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12113.00 TO NODE  12114.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2458.45  DOWNSTREAM(FEET) =   1823.37
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.76   CHANNEL SLOPE =  0.3336
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.82
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.294
 SUBAREA LOSS RATE DATA(AMC  II):
```



```
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       57.98      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     101.83
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.03
 AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   2.88
 Tc(MIN.) =   18.27
 SUBAREA AREA(ACRES) =    57.98       SUBAREA RUNOFF(CFS) =  104.04
 EFFECTIVE AREA(ACRES) =     82.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       82.7         PEAK FLOW RATE(CFS) =     148.47
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =  12.53
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12114.00 =    3788.41 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12114.00 TO NODE  12115.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1823.37  DOWNSTREAM(FEET) =   1500.53
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.04   CHANNEL SLOPE =  0.1916
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.121
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -      124.07      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     250.22
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.29
 AVERAGE FLOW DEPTH(FEET) =   1.55   TRAVEL TIME(MIN.) =   2.29
 Tc(MIN.) =   20.55
 SUBAREA AREA(ACRES) =   124.07       SUBAREA RUNOFF(CFS) =  203.35
 EFFECTIVE AREA(ACRES) =    206.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      206.8         PEAK FLOW RATE(CFS) =     338.97
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.84   FLOW VELOCITY(FEET/SEC.) =  13.45
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12115.00 =    5473.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =  56
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1500.53  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.45   CHANNEL SLOPE =  0.1519
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.12
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.985
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     386.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.89
  AVERAGE FLOW DEPTH(FEET) =   2.11   TRAVEL TIME(MIN.) =   2.42
  Tc(MIN.) =   22.98
  SUBAREA AREA(ACRES) =    62.55       SUBAREA RUNOFF(CFS) =   94.88
  EFFECTIVE AREA(ACRES) =    269.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      269.4         PEAK FLOW RATE(CFS) =     408.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.17   FLOW VELOCITY(FEET/SEC.) =  13.12
  LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12121.00 =    7348.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.98
  RAINFALL INTENSITY(INCH/HR) =   1.99
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     269.36
  TOTAL STREAM AREA(ACRES) =     269.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     408.57

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3132.93   28.46    1.740  0.30( 0.30) 1.00    2333.6   12101.10
      1     3319.18   39.87    1.431  0.30( 0.30) 1.00    3157.4   12010.00
      1     3039.04   46.84    1.317  0.30( 0.30) 1.00    3281.5   12000.00
      2      408.57   22.98    1.985  0.30( 0.30) 1.00     269.4   12111.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3369.10   22.98    1.985  0.30( 0.30) 1.00    2153.4   12111.00
      2     3481.99   28.46    1.740  0.30( 0.30) 1.00    2603.0   12101.10
      3     3593.42   39.87    1.431  0.30( 0.30) 1.00    3426.8   12010.00
      4     3285.63   46.84    1.317  0.30( 0.30) 1.00    3550.8   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    3593.42    Tc(MIN.) =    39.87
  EFFECTIVE AREA(ACRES) =    3426.76   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3550.8
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12121.00 TO NODE  12241.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1215.72  DOWNSTREAM(FEET) =   1122.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3397.13   CHANNEL SLOPE =  0.0275
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.80
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.357
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      136.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3658.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.63
  AVERAGE FLOW DEPTH(FEET) =   9.79   TRAVEL TIME(MIN.) =   4.48
  Tc(MIN.) =   44.36
  SUBAREA AREA(ACRES) =   136.41       SUBAREA RUNOFF(CFS) =  129.82
  EFFECTIVE AREA(ACRES) =   3563.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3687.2         PEAK FLOW RATE(CFS) =    3593.42
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.72   FLOW VELOCITY(FEET/SEC.) =  12.56
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3687.2  TC(MIN.) =     44.36
  EFFECTIVE AREA(ACRES) =   3563.17  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    3593.42

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3369.10	27.53	1.775	0.30(0.30)	1.00	2289.8	12111.00
2	3481.99	32.98	1.606	0.30(0.30)	1.00	2739.4	12101.10
3	3593.42	44.36	1.357	0.30(0.30)	1.00	3563.2	12010.00
4	3285.63	51.43	1.249	0.30(0.30)	1.00	3687.2	12000.00

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:
```

```
------------------------------------------------------------------------
  FILE NAME: S22.DAT
  TIME/DATE OF STUDY: 11:58 04/03/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.059
   2)   10.00;  3.304
   3)   15.00;  2.561
   4)   20.00;  2.152
   5)   25.00;  1.872
   6)   30.00;  1.681
   7)   40.00;  1.428
   8)   50.00;  1.266
   9)   60.00;  1.147
  10)   90.00;  0.946
  11)  120.00;  0.816
  12)  180.00;  0.687
  13)  360.00;  0.499
  14) 1440.00;  0.216
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  12201.00 TO NODE  12202.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   926.94
  ELEVATION DATA: UPSTREAM(FEET) =   3077.00  DOWNSTREAM(FEET) =   2740.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.295
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.814
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.74      0.30     1.000     0   13.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.99
  TOTAL AREA(ACRES) =      5.74   PEAK FLOW RATE(CFS) =     12.99

************************************************************************
  FLOW PROCESS FROM NODE  12202.00 TO NODE  12203.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2740.64  DOWNSTREAM(FEET) =   2551.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   832.53   CHANNEL SLOPE =  0.2271
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.47
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.525
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.46
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   15.44
  SUBAREA AREA(ACRES) =    18.85       SUBAREA RUNOFF(CFS) =   37.74
  EFFECTIVE AREA(ACRES) =     24.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.6          PEAK FLOW RATE(CFS) =      49.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   7.57
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12203.00 =    1759.47 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  12203.00 TO NODE  12204.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2551.60  DOWNSTREAM(FEET) =   2151.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.86   CHANNEL SLOPE =  0.1944
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.09
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.239
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     122.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.83
  AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   3.49
  Tc(MIN.) =   18.93
  SUBAREA AREA(ACRES) =    83.93       SUBAREA RUNOFF(CFS) =  146.51
  EFFECTIVE AREA(ACRES) =    108.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      108.5         PEAK FLOW RATE(CFS) =     189.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =  11.31
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12204.00 =    3816.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12204.00 TO NODE  12205.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2151.76  DOWNSTREAM(FEET) =   1788.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2363.99   CHANNEL SLOPE =  0.1538
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.99
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.034
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      182.26      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     331.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.38
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   3.18
  Tc(MIN.) =   22.11
  SUBAREA AREA(ACRES) =   182.26       SUBAREA RUNOFF(CFS) =  284.39
  EFFECTIVE AREA(ACRES) =    290.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      290.8         PEAK FLOW RATE(CFS) =     453.72
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.29   FLOW VELOCITY(FEET/SEC.) =  13.56
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12205.00 =    6180.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12205.00 TO NODE  12206.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1788.16  DOWNSTREAM(FEET) =   1385.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2825.33   CHANNEL SLOPE =  0.1424
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.65
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.854
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      153.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     560.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.03
  AVERAGE FLOW DEPTH(FEET) =   2.62   TRAVEL TIME(MIN.) =   3.36
  Tc(MIN.) =   25.47
  SUBAREA AREA(ACRES) =   153.05       SUBAREA RUNOFF(CFS) =  214.08
  EFFECTIVE AREA(ACRES) =    443.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      443.8         PEAK FLOW RATE(CFS) =     620.81
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.77   FLOW VELOCITY(FEET/SEC.) =  14.45
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12206.00 =    9005.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1385.78  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3579.23   CHANNEL SLOPE =  0.1061
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.685
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.52      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     703.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.45
  AVERAGE FLOW DEPTH(FEET) =   3.19   TRAVEL TIME(MIN.) =   4.43
  Tc(MIN.) =   29.90
  SUBAREA AREA(ACRES) =   132.52       SUBAREA RUNOFF(CFS) =  165.16
  EFFECTIVE AREA(ACRES) =    576.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      576.4          PEAK FLOW RATE(CFS) =     718.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.22   FLOW VELOCITY(FEET/SEC.) =  13.54
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.90
  RAINFALL INTENSITY(INCH/HR) =   1.68
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     576.35
  TOTAL STREAM AREA(ACRES) =     576.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     718.30

****************************************************************************
  FLOW PROCESS FROM NODE  12211.00 TO NODE  12212.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   733.41
  ELEVATION DATA: UPSTREAM(FEET) =   1669.93  DOWNSTREAM(FEET) =   1536.26

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.893
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.725
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        8.90      0.30     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     19.43
  TOTAL AREA(ACRES) =      8.90   PEAK FLOW RATE(CFS) =     19.43

****************************************************************************
  FLOW PROCESS FROM NODE  12212.00 TO NODE  12213.00 IS CODE =  56
```



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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1536.26  DOWNSTREAM(FEET) =   1416.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1253.05   CHANNEL SLOPE =  0.0960
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.318
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.13
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   4.07
  Tc(MIN.) =   17.97
  SUBAREA AREA(ACRES) =    17.91       SUBAREA RUNOFF(CFS) =   32.53
  EFFECTIVE AREA(ACRES) =     26.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       26.8         PEAK FLOW RATE(CFS) =      48.70
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   5.71
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12213.00 =    1986.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12213.00 TO NODE  12214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1416.02  DOWNSTREAM(FEET) =   1234.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1877.62   CHANNEL SLOPE =  0.0966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.053
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     147.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   1.40   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   21.76
  SUBAREA AREA(ACRES) =   125.19       SUBAREA RUNOFF(CFS) =  197.54
  EFFECTIVE AREA(ACRES) =    152.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      152.0          PEAK FLOW RATE(CFS) =     239.84
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.84   FLOW VELOCITY(FEET/SEC.) =   9.56
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12214.00 =    3864.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1234.66  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2510.91   CHANNEL SLOPE =  0.0910
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.80
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.856
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.35      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     477.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.43
  AVERAGE FLOW DEPTH(FEET) =   2.71   TRAVEL TIME(MIN.) =   3.66
  Tc(MIN.) =   25.43
  SUBAREA AREA(ACRES) =   339.35       SUBAREA RUNOFF(CFS) =  475.15
  EFFECTIVE AREA(ACRES) =    491.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      491.4         PEAK FLOW RATE(CFS) =     687.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.28   FLOW VELOCITY(FEET/SEC.) =  12.65
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12221.00 =    6374.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.43
  RAINFALL INTENSITY(INCH/HR) =   1.86
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     491.35
  TOTAL STREAM AREA(ACRES) =     491.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     687.97
```



```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      718.30   29.90    1.685  0.30( 0.30) 1.00     576.4   12201.00
      2      687.97   25.43    1.856  0.30( 0.30) 1.00     491.4   12211.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1374.17   25.43    1.856  0.30( 0.30) 1.00     981.4   12211.00
      2     1330.66   29.90    1.685  0.30( 0.30) 1.00    1067.7   12201.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1374.17    Tc(MIN.) =    25.43
  EFFECTIVE AREA(ACRES) =     981.43   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1067.7
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1006.12  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.84   CHANNEL SLOPE =  0.0459
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.68
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.731
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.60      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1456.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.05
  AVERAGE FLOW DEPTH(FEET) =   5.67   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   28.70
  SUBAREA AREA(ACRES) =   127.60       SUBAREA RUNOFF(CFS) =  164.32
  EFFECTIVE AREA(ACRES) =   1109.03     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1195.3         PEAK FLOW RATE(CFS) =    1428.22
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.61   FLOW VELOCITY(FEET/SEC.) =  11.99
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12231.00 TO NODE  12231.50 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   553.71
 ELEVATION DATA: UPSTREAM(FEET) =   2687.04  DOWNSTREAM(FEET) =   2470.68

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.660
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.206
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        3.48      0.30     1.000     0   10.66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      9.10
 TOTAL AREA(ACRES) =      3.48   PEAK FLOW RATE(CFS) =      9.10

****************************************************************************
 FLOW PROCESS FROM NODE  12231.50 TO NODE  12232.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2470.68  DOWNSTREAM(FEET) =   2375.54
 CHANNEL LENGTH THRU SUBAREA(FEET) =   410.38   CHANNEL SLOPE =  0.2318
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.39
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.034
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       12.43      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.41
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.90
 AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   1.16
 Tc(MIN.) =   11.82
 SUBAREA AREA(ACRES) =    12.43       SUBAREA RUNOFF(CFS) =   30.58
 EFFECTIVE AREA(ACRES) =     15.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       15.9         PEAK FLOW RATE(CFS) =      39.14
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.51

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  0.51   FLOW VELOCITY(FEET/SEC.) =   7.02
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12232.00 =     964.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12232.00 TO NODE  12233.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2375.54  DOWNSTREAM(FEET) =   2252.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =   939.16   CHANNEL SLOPE =  0.1305
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.77
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.687
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       17.65      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.15
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.72
 AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   2.33
 Tc(MIN.) =   14.15
 SUBAREA AREA(ACRES) =    17.65       SUBAREA RUNOFF(CFS) =   37.92
 EFFECTIVE AREA(ACRES) =     33.56     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       33.6         PEAK FLOW RATE(CFS) =      72.11
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.85

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   7.23
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12233.00 =    1903.25 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12233.00 TO NODE  12234.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2252.99  DOWNSTREAM(FEET) =   2163.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =   976.53   CHANNEL SLOPE =  0.0921
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.09
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.439
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       19.54      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      90.93
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.93
 AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   2.35
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  Tc(MIN.) =   16.50
  SUBAREA AREA(ACRES) =    19.54       SUBAREA RUNOFF(CFS) =   37.61
  EFFECTIVE AREA(ACRES) =     53.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       53.1         PEAK FLOW RATE(CFS) =     102.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =   7.19
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12234.00 =    2879.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12234.00 TO NODE  12235.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2163.07  DOWNSTREAM(FEET) =   2018.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.65   CHANNEL SLOPE =  0.0759
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.52
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.111
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     143.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.52
  AVERAGE FLOW DEPTH(FEET) =   1.48   TRAVEL TIME(MIN.) =   4.23
  Tc(MIN.) =   20.73
  SUBAREA AREA(ACRES) =    51.14       SUBAREA RUNOFF(CFS) =   83.37
  EFFECTIVE AREA(ACRES) =    104.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =     169.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.62   FLOW VELOCITY(FEET/SEC.) =   7.91
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12235.00 =    4789.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12235.00 TO NODE  12236.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2018.08  DOWNSTREAM(FEET) =   1607.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.94   CHANNEL SLOPE =  0.2162
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.36
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  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.964
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     205.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.03
  AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =   23.36
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   71.05
  EFFECTIVE AREA(ACRES) =    151.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =     227.18
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =  12.42
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12236.00 =    6686.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12236.00 TO NODE  12237.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1607.89  DOWNSTREAM(FEET) =   1326.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2213.20   CHANNEL SLOPE =  0.1273
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.808
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     286.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.07
  AVERAGE FLOW DEPTH(FEET) =   1.88   TRAVEL TIME(MIN.) =   3.33
  Tc(MIN.) =   26.69
  SUBAREA AREA(ACRES) =    87.00       SUBAREA RUNOFF(CFS) =  118.04
  EFFECTIVE AREA(ACRES) =    238.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      238.7         PEAK FLOW RATE(CFS) =     323.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.01   FLOW VELOCITY(FEET/SEC.) =  11.50
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12237.00 =    8899.57 FEET.

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 FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1326.23  DOWNSTREAM(FEET) =   1122.29
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2236.51   CHANNEL SLOPE =  0.0912
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.40
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.676
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       81.83      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     374.54
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.68
 AVERAGE FLOW DEPTH(FEET) =   2.38   TRAVEL TIME(MIN.) =   3.49
 Tc(MIN.) =   30.18
 SUBAREA AREA(ACRES) =    81.83       SUBAREA RUNOFF(CFS) =  101.38
 EFFECTIVE AREA(ACRES) =    320.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      320.5         PEAK FLOW RATE(CFS) =     397.07
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.45

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.45   FLOW VELOCITY(FEET/SEC.) =  10.85
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S21.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     3369.10   27.53  0.30( 0.30) 1.00    2289.8   12111.00
     2     3481.99   32.98  0.30( 0.30) 1.00    2739.4   12101.10
     3     3593.42   44.36  0.30( 0.30) 1.00    3563.2   12010.00
     4     3285.63   51.43  0.30( 0.30) 1.00    3687.2   12000.00
   TOTAL AREA(ACRES) =     3687.2

****************************************************************************
 FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
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============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     3369.10   27.53  0.30( 0.30) 1.00    2289.8   12111.00
     2     3481.99   32.98  0.30( 0.30) 1.00    2739.4   12101.10
     3     3593.42   44.36  0.30( 0.30) 1.00    3563.2   12010.00
     4     3285.63   51.43  0.30( 0.30) 1.00    3687.2   12000.00
   TOTAL AREA(ACRES) =      3687.2

****************************************************************************
 FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3369.10   27.53    1.775  0.30( 0.30) 1.00    2289.8   12111.00
     2     3481.99   32.98    1.606  0.30( 0.30) 1.00    2739.4   12101.10
     3     3593.42   44.36    1.357  0.30( 0.30) 1.00    3563.2   12010.00
     4     3285.63   51.43    1.249  0.30( 0.30) 1.00    3687.2   12000.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      397.07   30.18    1.676  0.30( 0.30) 1.00     320.5   12231.00
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3757.32   27.53    1.775  0.30( 0.30) 1.00    2582.1   12111.00
     2     3821.10   30.18    1.676  0.30( 0.30) 1.00    2829.1   12231.00
     3     3858.65   32.98    1.606  0.30( 0.30) 1.00    3059.9   12101.10
     4     3898.45   44.36    1.357  0.30( 0.30) 1.00    3883.7   12010.00
     5     3559.38   51.43    1.249  0.30( 0.30) 1.00    4007.7   12000.00
   TOTAL AREA(ACRES) =      4007.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     3898.45  Tc(MIN.) =   44.359
 EFFECTIVE AREA(ACRES) =   3883.68  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4007.7
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12241.00 TO NODE  12242.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1122.29  DOWNSTREAM(FEET) =   1062.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.03   CHANNEL SLOPE =  0.0291
 GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.40
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.315
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      219.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3998.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.96
  AVERAGE FLOW DEPTH(FEET) =   8.39   TRAVEL TIME(MIN.) =   2.64
  Tc(MIN.) =   47.00
  SUBAREA AREA(ACRES) =   219.09       SUBAREA RUNOFF(CFS) =  200.08
  EFFECTIVE AREA(ACRES) =   4102.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4226.8         PEAK FLOW RATE(CFS) =    3898.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.28   FLOW VELOCITY(FEET/SEC.) =  12.87
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12242.00 =   33064.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12242.00 TO NODE  12243.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1062.50  DOWNSTREAM(FEET) =    998.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.30   CHANNEL SLOPE =  0.0331
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.14
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.276
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      249.96      0.30     0.995     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4008.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.58
  AVERAGE FLOW DEPTH(FEET) =   8.14   TRAVEL TIME(MIN.) =   2.37
  Tc(MIN.) =   49.37
  SUBAREA AREA(ACRES) =   249.96       SUBAREA RUNOFF(CFS) =  219.97
  EFFECTIVE AREA(ACRES) =   4352.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4476.8         PEAK FLOW RATE(CFS) =    3898.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) =  8.02   FLOW VELOCITY(FEET/SEC.) =  13.48
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12243.00 =   34995.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12243.00 TO NODE  12244.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    998.53  DOWNSTREAM(FEET) =    926.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1863.28   CHANNEL SLOPE =  0.0389
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.78
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.248
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      166.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3969.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.37
  AVERAGE FLOW DEPTH(FEET) =   7.77   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   51.53
  SUBAREA AREA(ACRES) =   166.97       SUBAREA RUNOFF(CFS) =  142.44
  EFFECTIVE AREA(ACRES) =   4519.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4643.8         PEAK FLOW RATE(CFS) =    3898.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.70   FLOW VELOCITY(FEET/SEC.) =  14.30
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12244.00 =   36859.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12244.00 TO NODE  12251.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    926.00  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1665.37   CHANNEL SLOPE =  0.0170
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.52
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.217
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3932.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.59
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  AVERAGE FLOW DEPTH(FEET) =   9.52   TRAVEL TIME(MIN.) =   2.62
  Tc(MIN.) =   54.15
  SUBAREA AREA(ACRES) =    83.41       SUBAREA RUNOFF(CFS) =   68.81
  EFFECTIVE AREA(ACRES) =   4603.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4727.2         PEAK FLOW RATE(CFS) =    3898.45
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.47   FLOW VELOCITY(FEET/SEC.) =  10.57
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3757.32   37.40    1.494  0.30( 0.30) 1.00    3301.6   12111.00
      2     3821.10   40.01    1.428  0.30( 0.30) 1.00    3548.5   12231.00
      3     3858.65   42.79    1.383  0.30( 0.30) 1.00    3779.3   12101.10
      4     3898.45   54.15    1.217  0.30( 0.30) 1.00    4603.1   12010.00
      5     3601.33   61.46    1.137  0.30( 0.30) 1.00    4727.2   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1428.22   28.70    1.731  0.30( 0.30) 1.00    1109.0   12211.00
      2     1398.48   33.21    1.600  0.30( 0.30) 1.00    1195.3   12201.00
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     4883.43   28.70    1.731  0.30( 0.30) 1.00    3642.2   12211.00
      2     5030.89   33.21    1.600  0.30( 0.30) 1.00    4126.5   12201.00
      3     5041.63   37.40    1.494  0.30( 0.30) 1.00    4496.9   12111.00
      4     5034.50   40.01    1.428  0.30( 0.30) 1.00    4743.8   12231.00
      5     5023.65   42.79    1.383  0.30( 0.30) 1.00    4974.6   12101.10
      6     4884.57   54.15    1.217  0.30( 0.30) 1.00    5798.4   12010.00
      7     4502.09   61.46    1.137  0.30( 0.30) 1.00    5922.5   12000.00
    TOTAL AREA(ACRES) =      5922.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5041.63  Tc(MIN.) =   37.400
  EFFECTIVE AREA(ACRES) =   4496.87  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5922.5
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    897.69  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2133.08   CHANNEL SLOPE =  0.0238
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.94
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.425
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.79      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5085.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.83
  AVERAGE FLOW DEPTH(FEET) =   9.94   TRAVEL TIME(MIN.) =   2.77
  Tc(MIN.) =   40.17
  SUBAREA AREA(ACRES) =    85.79       SUBAREA RUNOFF(CFS) =   86.89
  EFFECTIVE AREA(ACRES) =   4582.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6008.3         PEAK FLOW RATE(CFS) =    5041.63
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.90   FLOW VELOCITY(FEET/SEC.) =  12.80
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12281.00 =   40657.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   40.17
  RAINFALL INTENSITY(INCH/HR) =   1.43
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    4582.66
  TOTAL STREAM AREA(ACRES) =    6008.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    5041.63

****************************************************************************
  FLOW PROCESS FROM NODE  12261.00 TO NODE  12261.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   378.71
  ELEVATION DATA: UPSTREAM(FEET) =   2264.27  DOWNSTREAM(FEET) =   2072.51
```

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  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.694
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.762
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.96      0.30     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.22
  TOTAL AREA(ACRES) =      2.96   PEAK FLOW RATE(CFS) =      9.22

****************************************************************************
  FLOW PROCESS FROM NODE  12261.50 TO NODE  12262.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2072.51  DOWNSTREAM(FEET) =   1875.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   609.41   CHANNEL SLOPE =  0.3233
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.261
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.36
  AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   1.60
  Tc(MIN.) =   10.29
  SUBAREA AREA(ACRES) =     9.89       SUBAREA RUNOFF(CFS) =   26.35
  EFFECTIVE AREA(ACRES) =     12.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.9         PEAK FLOW RATE(CFS) =      34.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   7.47
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12262.00 =     988.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12262.00 TO NODE  12263.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1875.51  DOWNSTREAM(FEET) =   1686.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.89   CHANNEL SLOPE =  0.1957
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.953
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.79
  AVERAGE FLOW DEPTH(FEET) =   0.68   TRAVEL TIME(MIN.) =   2.07
  Tc(MIN.) =   12.36
  SUBAREA AREA(ACRES) =    22.00       SUBAREA RUNOFF(CFS) =   52.53
  EFFECTIVE AREA(ACRES) =     34.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.8         PEAK FLOW RATE(CFS) =      83.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   8.64
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12263.00 =    1956.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12263.00 TO NODE  12264.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1686.10  DOWNSTREAM(FEET) =   1572.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.28   CHANNEL SLOPE =  0.1198
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.20
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.672
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.33
  AVERAGE FLOW DEPTH(FEET) =   1.18   TRAVEL TIME(MIN.) =   1.89
  Tc(MIN.) =   14.25
  SUBAREA AREA(ACRES) =    35.72       SUBAREA RUNOFF(CFS) =   76.26
  EFFECTIVE AREA(ACRES) =     70.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =     150.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.33   FLOW VELOCITY(FEET/SEC.) =   8.93
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12264.00 =    2900.29 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12264.00 TO NODE  12265.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1572.93  DOWNSTREAM(FEET) =   1506.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =   569.03   CHANNEL SLOPE =  0.1169
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.56
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.21      0.30     0.886     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.886
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     194.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.57
  AVERAGE FLOW DEPTH(FEET) =   1.55   TRAVEL TIME(MIN.) =   0.99
  Tc(MIN.) =   15.24
  SUBAREA AREA(ACRES) =    43.21       SUBAREA RUNOFF(CFS) =   88.49
  EFFECTIVE AREA(ACRES) =    113.78     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      113.8         PEAK FLOW RATE(CFS) =     230.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =  10.09
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12265.00 =    3469.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12265.00 TO NODE  12266.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.41  DOWNSTREAM(FEET) =   1311.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2121.93   CHANNEL SLOPE =  0.0920
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.17
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.255
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.55      0.30     0.710     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.710
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     308.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.10
  AVERAGE FLOW DEPTH(FEET) =   2.14   TRAVEL TIME(MIN.) =   3.50
  Tc(MIN.) =   18.74
  SUBAREA AREA(ACRES) =    84.55       SUBAREA RUNOFF(CFS) =  155.38
  EFFECTIVE AREA(ACRES) =    198.33     AREA-AVERAGED Fm(INCH/HR) =   0.26
```



```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.85
  TOTAL AREA(ACRES) =      198.3         PEAK FLOW RATE(CFS) =     356.89
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.31   FLOW VELOCITY(FEET/SEC.) =  10.54
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12266.00 =    5591.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12266.00 TO NODE  12267.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1311.17  DOWNSTREAM(FEET) =   1232.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1555.18   CHANNEL SLOPE =  0.0506
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.25
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.067
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      160.37      0.30     0.633     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.633
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     492.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.32
  AVERAGE FLOW DEPTH(FEET) =   3.21   TRAVEL TIME(MIN.) =   2.78
  Tc(MIN.) =   21.52
  SUBAREA AREA(ACRES) =   160.37       SUBAREA RUNOFF(CFS) =  270.89
  EFFECTIVE AREA(ACRES) =    358.70     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.75
  TOTAL AREA(ACRES) =      358.7         PEAK FLOW RATE(CFS) =     594.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.54   FLOW VELOCITY(FEET/SEC.) =   9.82
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12267.00 =    7146.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12267.00 TO NODE  12268.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1232.47  DOWNSTREAM(FEET) =   1141.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2111.19   CHANNEL SLOPE =  0.0430
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.95
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.864
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      100.65      0.30     0.970     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.970
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     665.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.55
  AVERAGE FLOW DEPTH(FEET) =   3.91   TRAVEL TIME(MIN.) =   3.69
  Tc(MIN.) =   25.21
  SUBAREA AREA(ACRES) =   100.65       SUBAREA RUNOFF(CFS) =  142.50
  EFFECTIVE AREA(ACRES) =    459.35     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      459.4         PEAK FLOW RATE(CFS) =     671.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.93   FLOW VELOCITY(FEET/SEC.) =   9.58
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12268.00 =    9257.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12268.00 TO NODE  12269.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1141.79  DOWNSTREAM(FEET) =   1115.83
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1295.17   CHANNEL SLOPE =  0.0200
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.01
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.753
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      103.26      0.30     0.838     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.838
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     741.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.43
  AVERAGE FLOW DEPTH(FEET) =   4.99   TRAVEL TIME(MIN.) =   2.91
  Tc(MIN.) =   28.12
  SUBAREA AREA(ACRES) =   103.26       SUBAREA RUNOFF(CFS) =  139.55
  EFFECTIVE AREA(ACRES) =    562.61     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      562.6         PEAK FLOW RATE(CFS) =     764.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.07   FLOW VELOCITY(FEET/SEC.) =   7.49
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.00 =   10552.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.00 TO NODE  12269.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1115.83  DOWNSTREAM(FEET) =   1100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1137.63   CHANNEL SLOPE =  0.0139
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.66
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.656
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.20      0.30     0.708     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.708
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     797.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.63
  AVERAGE FLOW DEPTH(FEET) =   5.65   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =   30.98
  SUBAREA AREA(ACRES) =    50.20       SUBAREA RUNOFF(CFS) =   65.24
  EFFECTIVE AREA(ACRES) =    612.81     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      612.8         PEAK FLOW RATE(CFS) =     781.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.60   FLOW VELOCITY(FEET/SEC.) =   6.59
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.50 =   11690.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.50 TO NODE  12270.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1091.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1219.38   CHANNEL SLOPE =  0.0073
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.76
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.559
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.30      0.30     0.583     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.583
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     842.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.30
  AVERAGE FLOW DEPTH(FEET) =   6.76   TRAVEL TIME(MIN.) =   3.83
  Tc(MIN.) =   34.81
  SUBAREA AREA(ACRES) =    98.30       SUBAREA RUNOFF(CFS) =  122.48
  EFFECTIVE AREA(ACRES) =    711.11     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      711.1         PEAK FLOW RATE(CFS) =     850.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.79   FLOW VELOCITY(FEET/SEC.) =   5.31
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12270.00 =   12909.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12270.00 TO NODE  12271.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1091.06  DOWNSTREAM(FEET) =    962.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1995.19   CHANNEL SLOPE =  0.0646
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.24
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.490
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.93      0.30     0.746     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.746
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     953.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.21
  AVERAGE FLOW DEPTH(FEET) =   4.23   TRAVEL TIME(MIN.) =   2.72
  Tc(MIN.) =   37.53
  SUBAREA AREA(ACRES) =   181.93       SUBAREA RUNOFF(CFS) =  207.40
  EFFECTIVE AREA(ACRES) =    893.04     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.76
  TOTAL AREA(ACRES) =      893.0         PEAK FLOW RATE(CFS) =    1013.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.36   FLOW VELOCITY(FEET/SEC.) =  12.41
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12271.00 =   14904.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12271.00 TO NODE  12272.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    962.23  DOWNSTREAM(FEET) =    917.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1613.85   CHANNEL SLOPE =  0.0278
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.63
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.421
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.79      0.30     0.910     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
```



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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1107.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.32
  AVERAGE FLOW DEPTH(FEET) =   5.60   TRAVEL TIME(MIN.) =   2.89
  Tc(MIN.) =   40.42
  SUBAREA AREA(ACRES) =   181.79       SUBAREA RUNOFF(CFS) =  187.87
  EFFECTIVE AREA(ACRES) =   1074.83     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.79
  TOTAL AREA(ACRES) =     1074.8         PEAK FLOW RATE(CFS) =    1145.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.70   FLOW VELOCITY(FEET/SEC.) =   9.40
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12272.00 =   16518.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    917.38  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3182.34   CHANNEL SLOPE =  0.0221
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.12
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.323
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.99      0.30     0.948     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.948
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1183.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.72
  AVERAGE FLOW DEPTH(FEET) =   6.11   TRAVEL TIME(MIN.) =   6.08
  Tc(MIN.) =   46.50
  SUBAREA AREA(ACRES) =    79.99       SUBAREA RUNOFF(CFS) =   74.75
  EFFECTIVE AREA(ACRES) =   1154.82     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     1154.8         PEAK FLOW RATE(CFS) =    1145.73
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.02   FLOW VELOCITY(FEET/SEC.) =   8.64
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12281.00 =   19701.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 46.50
RAINFALL INTENSITY(INCH/HR) = 1.32
AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.80
EFFECTIVE STREAM AREA(ACRES) = 1154.82
TOTAL STREAM AREA(ACRES) = 1154.82
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1145.73

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4883.43	31.49	1.643	0.30(0.30)	1.00	3728.0	12211.00
1	5030.89	35.98	1.530	0.30(0.30)	1.00	4212.3	12201.00
1	5041.63	40.17	1.425	0.30(0.30)	1.00	4582.7	12111.00
1	5034.50	42.78	1.383	0.30(0.30)	1.00	4829.6	12231.00
1	5023.65	45.56	1.338	0.30(0.30)	1.00	5060.4	12101.10
1	4884.57	56.95	1.183	0.30(0.30)	1.00	5884.2	12010.00
1	4502.09	64.31	1.118	0.30(0.30)	1.00	6008.3	12000.00
2	1145.73	46.50	1.323	0.30(0.24)	0.80	1154.8	12261.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5889.04	31.49	1.643	0.30(0.29)	0.97	4509.9	12211.00
2	6086.87	35.98	1.530	0.30(0.29)	0.96	5105.7	12201.00
3	6125.12	40.17	1.425	0.30(0.29)	0.96	5580.2	12111.00
4	6147.22	42.78	1.383	0.30(0.29)	0.96	5891.9	12231.00
5	6161.98	45.56	1.338	0.30(0.29)	0.96	6191.8	12101.10
6	6157.86	46.50	1.323	0.30(0.29)	0.96	6283.4	12261.00
7	5882.86	56.95	1.183	0.30(0.29)	0.97	7039.0	12010.00
8	5431.34	64.31	1.118	0.30(0.29)	0.97	7163.1	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 6161.98 Tc(MIN.) = 45.56
EFFECTIVE AREA(ACRES) = 6191.80 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7163.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

****
FLOW PROCESS FROM NODE 12281.00 TO NODE 12282.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 846.91 DOWNSTREAM(FEET) = 835.60
CHANNEL LENGTH THRU SUBAREA(FEET) = 1561.00 CHANNEL SLOPE = 0.0072
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 14.63
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.290
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	267.56	0.30	0.867	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6285.95
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.73
AVERAGE FLOW DEPTH(FEET) = 14.62 TRAVEL TIME(MIN.) = 2.98
Tc(MIN.) = 48.54
SUBAREA AREA(ACRES) = 267.56 SUBAREA RUNOFF(CFS) = 247.93
EFFECTIVE AREA(ACRES) = 6459.36 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7430.6 PEAK FLOW RATE(CFS) = 6161.98
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 14.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 14.48 FLOW VELOCITY(FEET/SEC.) = 8.69
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12282.00 = 42218.56 FEET.
==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 7430.6 TC(MIN.) = 48.54
EFFECTIVE AREA(ACRES) = 6459.36 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.959
PEAK FLOW RATE(CFS) = 6161.98

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5889.04	34.50	1.567	0.30(0.29)	0.96	4777.5	12211.00
2	6086.87	38.96	1.454	0.30(0.29)	0.96	5373.3	12201.00
3	6125.12	43.15	1.377	0.30(0.29)	0.96	5847.8	12111.00
4	6147.22	45.76	1.335	0.30(0.29)	0.96	6159.5	12231.00
5	6161.98	48.54	1.290	0.30(0.29)	0.96	6459.4	12101.10
6	6157.86	49.48	1.274	0.30(0.29)	0.96	6551.0	12261.00
7	5882.86	59.96	1.147	0.30(0.29)	0.96	7306.6	12010.00
8	5431.34	67.39	1.097	0.30(0.29)	0.96	7430.6	12000.00

==========
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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:
```

FILE NAME: S23.DAT
TIME/DATE OF STUDY: 11:58 04/03/2013

==========

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
USER-DEFINED TABLED RAINFALL USED
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	5.059
2)	10.00;	3.304
3)	15.00;	2.561
4)	20.00;	2.152
5)	25.00;	1.872
6)	30.00;	1.681
7)	40.00;	1.428
8)	50.00;	1.266
9)	60.00;	1.147
10)	90.00;	0.946
11)	120.00;	0.816
12)	180.00;	0.687
13)	360.00;	0.499
14)	1440.00;	0.216

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****
FLOW PROCESS FROM NODE 12300.00 TO NODE 12301.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

==========

INITIAL SUBAREA FLOW-LENGTH(FEET) = 924.36
ELEVATION DATA: UPSTREAM(FEET) = 1712.53 DOWNSTREAM(FEET) = 1490.12

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.417
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.648
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "GRASS"	-	6.66	0.30	1.000	0	14.42

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 14.07
TOTAL AREA(ACRES) = 6.66 PEAK FLOW RATE(CFS) = 14.07

****
FLOW PROCESS FROM NODE 12301.00 TO NODE 12302.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 1490.12 DOWNSTREAM(FEET) = 1117.78
CHANNEL LENGTH THRU SUBAREA(FEET) = 1564.45 CHANNEL SLOPE = 0.2380
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.62
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.335
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	39.97	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.84
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.79
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 3.35
Tc(MIN.) = 17.77
SUBAREA AREA(ACRES) = 39.97 SUBAREA RUNOFF(CFS) = 73.20
EFFECTIVE AREA(ACRES) = 46.63 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 46.6 PEAK FLOW RATE(CFS) = 85.40
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.79 FLOW VELOCITY(FEET/SEC.) = 9.33
LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12302.00 = 2488.81 FEET.

****
FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 56

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1117.78  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2216.41   CHANNEL SLOPE =  0.1520
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.051
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     126.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.13
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   21.81
  SUBAREA AREA(ACRES) =    51.51       SUBAREA RUNOFF(CFS) =   81.16
  EFFECTIVE AREA(ACRES) =     98.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       98.1         PEAK FLOW RATE(CFS) =     154.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   9.77
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S22.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     5889.04   34.50  0.30( 0.29) 0.96    4777.5   12211.00
      2     6086.87   38.96  0.30( 0.29) 0.96    5373.3   12201.00
      3     6125.12   43.15  0.30( 0.29) 0.96    5847.8   12111.00
      4     6147.22   45.76  0.30( 0.29) 0.96    6159.5   12231.00
      5     6161.98   48.54  0.30( 0.29) 0.96    6459.4   12101.10
      6     6157.86   49.48  0.30( 0.29) 0.96    6551.0   12261.00
      7     5882.86   59.96  0.30( 0.29) 0.96    7306.6   12010.00
      8     5431.34   67.39  0.30( 0.29) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     5889.04   34.50  0.30( 0.29) 0.96    4777.5   12211.00
      2     6086.87   38.96  0.30( 0.29) 0.96    5373.3   12201.00
      3     6125.12   43.15  0.30( 0.29) 0.96    5847.8   12111.00
      4     6147.22   45.76  0.30( 0.29) 0.96    6159.5   12231.00
      5     6161.98   48.54  0.30( 0.29) 0.96    6459.4   12101.10
      6     6157.86   49.48  0.30( 0.29) 0.96    6551.0   12261.00
      7     5882.86   59.96  0.30( 0.29) 0.96    7306.6   12010.00
      8     5431.34   67.39  0.30( 0.29) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    835.60  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1568.10   CHANNEL SLOPE =  0.0349
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.04
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.261
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.15      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6184.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.22
  AVERAGE FLOW DEPTH(FEET) =   8.04   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   50.38
  SUBAREA AREA(ACRES) =    51.15       SUBAREA RUNOFF(CFS) =   44.27
  EFFECTIVE AREA(ACRES) =   6510.51     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     7481.8         PEAK FLOW RATE(CFS) =    6161.98
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.02   FLOW VELOCITY(FEET/SEC.) =  14.20
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      5889.04   36.36    1.520  0.30( 0.29) 0.96    4828.6   12211.00
     2      6086.87   40.81    1.415  0.30( 0.29) 0.96    5424.4   12201.00
     3      6125.12   44.99    1.347  0.30( 0.29) 0.96    5898.9   12111.00
     4      6147.22   47.60    1.305  0.30( 0.29) 0.96    6210.7   12231.00
     5      6161.98   50.38    1.261  0.30( 0.29) 0.96    6510.5   12101.10
     6      6157.86   51.32    1.250  0.30( 0.29) 0.96    6602.2   12261.00
     7      5882.86   61.83    1.135  0.30( 0.29) 0.96    7357.7   12010.00
     8      5431.34   69.29    1.085  0.30( 0.29) 0.96    7481.8   12000.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       154.63   21.81    2.051  0.30( 0.30) 1.00      98.1   12300.00
 LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      5208.25   21.81    2.051  0.30( 0.29) 0.96    2994.7   12300.00
     2      5996.82   36.36    1.520  0.30( 0.29) 0.96    4926.8   12211.00
     3      6185.35   40.81    1.415  0.30( 0.29) 0.96    5522.6   12201.00
     4      6217.61   44.99    1.347  0.30( 0.29) 0.96    5997.1   12111.00
     5      6235.99   47.60    1.305  0.30( 0.29) 0.96    6308.8   12231.00
     6      6246.91   50.38    1.261  0.30( 0.29) 0.96    6608.7   12101.10
     7      6241.80   51.32    1.250  0.30( 0.29) 0.96    6700.3   12261.00
     8      5956.60   61.83    1.135  0.30( 0.29) 0.96    7455.9   12010.00
     9      5500.66   69.29    1.085  0.30( 0.29) 0.96    7579.9   12000.00
   TOTAL AREA(ACRES) =      7579.9

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     6246.91  Tc(MIN.) =   50.379
 EFFECTIVE AREA(ACRES) =   6608.65  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     7579.9
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12320.00 TO NODE  12321.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    780.80  DOWNSTREAM(FEET) =    761.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2102.41   CHANNEL SLOPE =  0.0091
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.32
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.214
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      180.82      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6321.28
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.74
 AVERAGE FLOW DEPTH(FEET) =  11.31   TRAVEL TIME(MIN.) =   4.01
 Tc(MIN.) =   54.39
 SUBAREA AREA(ACRES) =   180.82       SUBAREA RUNOFF(CFS) =  148.72
 EFFECTIVE AREA(ACRES) =   6789.47     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     7760.8          PEAK FLOW RATE(CFS) =    6246.91
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.24

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 11.24   FLOW VELOCITY(FEET/SEC.) =   8.72
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12321.00 =   45889.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12321.00 TO NODE  12322.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    761.66  DOWNSTREAM(FEET) =    710.30
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.13   CHANNEL SLOPE =  0.0268
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.70
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.185
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      217.17      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6333.37
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.99
 AVERAGE FLOW DEPTH(FEET) =   8.69   TRAVEL TIME(MIN.) =   2.46
 Tc(MIN.) =   56.84
 SUBAREA AREA(ACRES) =   217.17       SUBAREA RUNOFF(CFS) =  172.90
 EFFECTIVE AREA(ACRES) =   7006.64     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     7977.9          PEAK FLOW RATE(CFS) =    6246.91
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.63

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.63   FLOW VELOCITY(FEET/SEC.) =  12.94
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12322.00 =   47805.20 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    710.30  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1977.07   CHANNEL SLOPE =  0.0162
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.84
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.148
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.67      0.30     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6321.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.82
  AVERAGE FLOW DEPTH(FEET) =   9.82   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   59.89
  SUBAREA AREA(ACRES) =   194.67       SUBAREA RUNOFF(CFS) =  148.69
  EFFECTIVE AREA(ACRES) =   7201.31     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     8172.6         PEAK FLOW RATE(CFS) =    6246.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.77   FLOW VELOCITY(FEET/SEC.) =  10.78
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   59.89
  RAINFALL INTENSITY(INCH/HR) =   1.15
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96
  EFFECTIVE STREAM AREA(ACRES) =    7201.31
  TOTAL STREAM AREA(ACRES) =    8172.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    6246.91

****************************************************************************
  FLOW PROCESS FROM NODE  12330.00 TO NODE  12331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   994.42
  ELEVATION DATA: UPSTREAM(FEET) =   1754.00  DOWNSTREAM(FEET) =   1530.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.046
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.557
```



```
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        3.33      0.30     1.000     0   15.05
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.77
  TOTAL AREA(ACRES) =      3.33   PEAK FLOW RATE(CFS) =      6.77

****************************************************************************
  FLOW PROCESS FROM NODE  12331.00 TO NODE  12332.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1530.30  DOWNSTREAM(FEET) =   1412.81
  CHANNEL LENGTH THRU SUBAREA(FEET) =   946.66   CHANNEL SLOPE =  0.1241
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.57
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.316
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.08      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.36
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   17.99
  SUBAREA AREA(ACRES) =    28.08       SUBAREA RUNOFF(CFS) =   50.96
  EFFECTIVE AREA(ACRES) =     31.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.4         PEAK FLOW RATE(CFS) =      57.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.76   FLOW VELOCITY(FEET/SEC.) =   6.53
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12332.00 =    1941.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12332.00 TO NODE  12333.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1412.81  DOWNSTREAM(FEET) =   1235.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.37   CHANNEL SLOPE =  0.0907
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.000
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       44.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      91.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.91
  AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   4.73
  Tc(MIN.) =   22.72
  SUBAREA AREA(ACRES) =    44.96       SUBAREA RUNOFF(CFS) =   68.78
  EFFECTIVE AREA(ACRES) =     76.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.4         PEAK FLOW RATE(CFS) =     116.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) =   7.49
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12333.00 =    3900.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12333.00 TO NODE  12334.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1235.19  DOWNSTREAM(FEET) =   1013.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1921.81   CHANNEL SLOPE =  0.1151
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.816
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     137.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.53
  AVERAGE FLOW DEPTH(FEET) =   1.28   TRAVEL TIME(MIN.) =   3.76
  Tc(MIN.) =   26.48
  SUBAREA AREA(ACRES) =    30.50       SUBAREA RUNOFF(CFS) =   41.61
  EFFECTIVE AREA(ACRES) =    106.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.9         PEAK FLOW RATE(CFS) =     145.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   8.70
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12334.00 =    5822.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12334.00 TO NODE  12335.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1013.96  DOWNSTREAM(FEET) =    809.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2029.80   CHANNEL SLOPE =  0.1006
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.84
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.682
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     236.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.64
  AVERAGE FLOW DEPTH(FEET) =   1.80   TRAVEL TIME(MIN.) =   3.51
  Tc(MIN.) =   29.99
  SUBAREA AREA(ACRES) =   145.82       SUBAREA RUNOFF(CFS) =  181.32
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =     314.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.11   FLOW VELOCITY(FEET/SEC.) =  10.48
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12335.00 =    7852.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    809.84  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.44   CHANNEL SLOPE =  0.0691
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.45
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.596
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     343.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.44
  AVERAGE FLOW DEPTH(FEET) =   2.45   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   33.35
  SUBAREA AREA(ACRES) =    50.71       SUBAREA RUNOFF(CFS) =   59.16
  EFFECTIVE AREA(ACRES) =    303.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.4         PEAK FLOW RATE(CFS) =     353.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
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 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.49

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.49   FLOW VELOCITY(FEET/SEC.) =   9.49
 LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12340.00 =    9757.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   33.35
 RAINFALL INTENSITY(INCH/HR) =   1.60
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     303.40
 TOTAL STREAM AREA(ACRES) =     303.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     353.97

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5208.25   31.76    1.636  0.30( 0.29) 0.97    3587.4   12300.00
     1     5996.82   45.96    1.331  0.30( 0.29) 0.97    5519.4   12211.00
     1     6185.35   50.34    1.262  0.30( 0.29) 0.96    6115.2   12201.00
     1     6217.61   54.52    1.212  0.30( 0.29) 0.96    6589.7   12111.00
     1     6235.99   57.12    1.181  0.30( 0.29) 0.96    6901.5   12231.00
     1     6246.91   59.89    1.148  0.30( 0.29) 0.96    7201.3   12101.10
     1     6241.80   60.84    1.141  0.30( 0.29) 0.96    7293.0   12261.00
     1     5956.60   71.46    1.070  0.30( 0.29) 0.97    8048.5   12010.00
     1     5500.66   79.14    1.019  0.30( 0.29) 0.97    8172.6   12000.00
     2      353.97   33.35    1.596  0.30( 0.30) 1.00     303.4   12330.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5555.82   31.76    1.636  0.30( 0.29) 0.97    3876.4   12300.00
     2     5650.28   33.35    1.596  0.30( 0.29) 0.97    4106.6   12330.00
     3     6278.47   45.96    1.331  0.30( 0.29) 0.97    5822.8   12211.00
     4     6448.06   50.34    1.262  0.30( 0.29) 0.97    6418.6   12201.00
     5     6466.74   54.52    1.212  0.30( 0.29) 0.97    6893.1   12111.00
     6     6476.66   57.12    1.181  0.30( 0.29) 0.97    7204.9   12231.00
     7     6478.57   59.89    1.148  0.30( 0.29) 0.96    7504.7   12101.10
     8     6471.57   60.84    1.141  0.30( 0.29) 0.96    7596.4   12261.00
     9     6166.93   71.46    1.070  0.30( 0.29) 0.97    8351.9   12010.00
    10     5696.95   79.14    1.019  0.30( 0.29) 0.97    8476.0   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    6478.57    Tc(MIN.) =    59.89
 EFFECTIVE AREA(ACRES) =    7504.71   AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
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 TOTAL AREA(ACRES) =     8476.0
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12340.00 TO NODE  12341.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    678.19  DOWNSTREAM(FEET) =    630.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2827.23   CHANNEL SLOPE =  0.0170
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.94
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.119
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      317.33      0.30     0.999     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6595.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.12
 AVERAGE FLOW DEPTH(FEET) =   9.92   TRAVEL TIME(MIN.) =   4.24
 Tc(MIN.) =   64.13
 SUBAREA AREA(ACRES) =   317.33       SUBAREA RUNOFF(CFS) =  234.11
 EFFECTIVE AREA(ACRES) =   7822.04     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     8793.3          PEAK FLOW RATE(CFS) =    6478.57
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.84   FLOW VELOCITY(FEET/SEC.) =  11.06
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12341.00 =   52609.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12341.00 TO NODE  12342.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    630.21  DOWNSTREAM(FEET) =    601.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2006.47   CHANNEL SLOPE =  0.0142
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.31
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.098
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      124.13      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6523.14
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.39
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  AVERAGE FLOW DEPTH(FEET) =  10.30   TRAVEL TIME(MIN.) =   3.22
  Tc(MIN.) =   67.35
  SUBAREA AREA(ACRES) =   124.13       SUBAREA RUNOFF(CFS) =   89.13
  EFFECTIVE AREA(ACRES) =   7946.17     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     8917.5         PEAK FLOW RATE(CFS) =    6478.57
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.27   FLOW VELOCITY(FEET/SEC.) =  10.37
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12342.00 =   54615.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    601.66  DOWNSTREAM(FEET) =    572.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.49   CHANNEL SLOPE =  0.0156
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.08
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.078
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.92      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6512.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.74
  AVERAGE FLOW DEPTH(FEET) =  10.07   TRAVEL TIME(MIN.) =   2.93
  Tc(MIN.) =   70.27
  SUBAREA AREA(ACRES) =    96.92       SUBAREA RUNOFF(CFS) =   67.89
  EFFECTIVE AREA(ACRES) =   8043.09     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     9014.4         PEAK FLOW RATE(CFS) =    6478.57
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.05   FLOW VELOCITY(FEET/SEC.) =  10.73
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     9014.4  TC(MIN.) =     70.27
  EFFECTIVE AREA(ACRES) =   8043.09  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.967
  PEAK FLOW RATE(CFS)   =    6478.57

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```


NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	5555.82	42.56	1.386	0.30(0.29)	0.97	4414.7	12300.00
2	5650.28	44.10	1.362	0.30(0.29)	0.97	4644.9	12330.00
3	6278.47	56.43	1.190	0.30(0.29)	0.97	6361.2	12211.00
4	6448.06	60.73	1.142	0.30(0.29)	0.97	6957.0	12201.00
5	6466.74	64.90	1.114	0.30(0.29)	0.97	7431.5	12111.00
6	6476.66	67.50	1.097	0.30(0.29)	0.97	7743.2	12231.00
7	6478.57	70.27	1.078	0.30(0.29)	0.97	8043.1	12101.10
8	6471.57	71.22	1.072	0.30(0.29)	0.97	8134.7	12261.00
9	6166.93	81.98	1.000	0.30(0.29)	0.97	8890.3	12010.00
10	5696.95	89.88	0.947	0.30(0.29)	0.97	9014.4	12000.00

```
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S24.DAT
  TIME/DATE OF STUDY: 11:58 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.059
   2)   10.00;  3.304
   3)   15.00;  2.561
   4)   20.00;  2.152
   5)   25.00;  1.872
   6)   30.00;  1.681
   7)   40.00;  1.428
   8)   50.00;  1.266
   9)   60.00;  1.147
  10)   90.00;  0.946
  11)  120.00;  0.816
  12)  180.00;  0.687
  13)  360.00;  0.499
  14) 1440.00;  0.216
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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**************************************************************************
  FLOW PROCESS FROM NODE  12400.00 TO NODE  12401.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   981.52
  ELEVATION DATA: UPSTREAM(FEET) =   2579.17  DOWNSTREAM(FEET) =   2249.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.811
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.738
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.82      0.30     1.000     0   13.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     19.35
  TOTAL AREA(ACRES) =      8.82   PEAK FLOW RATE(CFS) =     19.35

**************************************************************************
  FLOW PROCESS FROM NODE  12401.00 TO NODE  12402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2249.14  DOWNSTREAM(FEET) =   2103.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   975.11   CHANNEL SLOPE =  0.1490
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.81
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.475
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.29      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.25
  AVERAGE FLOW DEPTH(FEET) =   0.77   TRAVEL TIME(MIN.) =   2.24
  Tc(MIN.) =   16.05
  SUBAREA AREA(ACRES) =    46.29       SUBAREA RUNOFF(CFS) =   90.61
  EFFECTIVE AREA(ACRES) =     55.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.1          PEAK FLOW RATE(CFS) =     107.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   8.64
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12402.00 =    1956.63 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12402.00 TO NODE  12403.00 IS CODE =  56
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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2103.89  DOWNSTREAM(FEET) =   1771.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.50   CHANNEL SLOPE =  0.1768
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.225
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     155.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.27
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   19.10
  SUBAREA AREA(ACRES) =    54.97       SUBAREA RUNOFF(CFS) =   95.25
  EFFECTIVE AREA(ACRES) =    110.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =     190.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.37   FLOW VELOCITY(FEET/SEC.) =  10.94
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12403.00 =    3837.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12403.00 TO NODE  12404.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1771.34  DOWNSTREAM(FEET) =   1462.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2888.53   CHANNEL SLOPE =  0.1070
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.01
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.942
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     281.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.36
  AVERAGE FLOW DEPTH(FEET) =   1.96   TRAVEL TIME(MIN.) =   4.65
  Tc(MIN.) =   23.75
  SUBAREA AREA(ACRES) =   123.02       SUBAREA RUNOFF(CFS) =  181.80
  EFFECTIVE AREA(ACRES) =    233.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      233.1         PEAK FLOW RATE(CFS) =     344.48
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.18   FLOW VELOCITY(FEET/SEC.) =  11.01
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12404.00 =    6725.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12404.00 TO NODE  12405.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1462.30  DOWNSTREAM(FEET) =   1308.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.25   CHANNEL SLOPE =  0.0800
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.94
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.809
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      241.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     508.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.09
  AVERAGE FLOW DEPTH(FEET) =   2.90   TRAVEL TIME(MIN.) =   2.89
  Tc(MIN.) =   26.64
  SUBAREA AREA(ACRES) =   241.71       SUBAREA RUNOFF(CFS) =  328.33
  EFFECTIVE AREA(ACRES) =    474.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      474.8         PEAK FLOW RATE(CFS) =     644.96
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.28   FLOW VELOCITY(FEET/SEC.) =  11.86
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12405.00 =    8650.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12405.00 TO NODE  12406.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.28  DOWNSTREAM(FEET) =   1154.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1923.41   CHANNEL SLOPE =  0.0802
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.68
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.712
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.96      0.30     1.000     -
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     796.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.58
  AVERAGE FLOW DEPTH(FEET) =   3.66   TRAVEL TIME(MIN.) =   2.55
  Tc(MIN.) =   29.19
  SUBAREA AREA(ACRES) =   238.96       SUBAREA RUNOFF(CFS) =  303.66
  EFFECTIVE AREA(ACRES) =    713.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      713.8         PEAK FLOW RATE(CFS) =     907.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.91   FLOW VELOCITY(FEET/SEC.) =  13.02
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12406.00 =   10574.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1154.02  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1607.69   CHANNEL SLOPE =  0.0503
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.48
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.640
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     942.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.11
  AVERAGE FLOW DEPTH(FEET) =   4.48   TRAVEL TIME(MIN.) =   2.41
  Tc(MIN.) =   31.60
  SUBAREA AREA(ACRES) =    58.02       SUBAREA RUNOFF(CFS) =   70.00
  EFFECTIVE AREA(ACRES) =    771.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      771.8         PEAK FLOW RATE(CFS) =     931.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.45   FLOW VELOCITY(FEET/SEC.) =  11.07
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
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  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.60
  RAINFALL INTENSITY(INCH/HR) =   1.64
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     771.79
  TOTAL STREAM AREA(ACRES) =     771.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     931.12

****************************************************************************
  FLOW PROCESS FROM NODE  12410.00 TO NODE  12411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   966.15
  ELEVATION DATA: UPSTREAM(FEET) =   2215.42  DOWNSTREAM(FEET) =   1909.05

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.886
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.727
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.99      0.30     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     19.63
  TOTAL AREA(ACRES) =      8.99   PEAK FLOW RATE(CFS) =     19.63

****************************************************************************
  FLOW PROCESS FROM NODE  12411.00 TO NODE  12412.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1909.05  DOWNSTREAM(FEET) =   1794.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.59   CHANNEL SLOPE =  0.1215
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.424
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.65
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   2.78
  Tc(MIN.) =   16.67
  SUBAREA AREA(ACRES) =    18.56       SUBAREA RUNOFF(CFS) =   35.49
  EFFECTIVE AREA(ACRES) =     27.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.5         PEAK FLOW RATE(CFS) =      52.68
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.73   FLOW VELOCITY(FEET/SEC.) =   6.32
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12412.00 =    1909.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12412.00 TO NODE  12413.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.38  DOWNSTREAM(FEET) =   1649.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.82   CHANNEL SLOPE =  0.1560
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.255
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      66.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.46
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   2.07
  Tc(MIN.) =   18.74
  SUBAREA AREA(ACRES) =    16.09       SUBAREA RUNOFF(CFS) =   28.31
  EFFECTIVE AREA(ACRES) =     43.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       43.6         PEAK FLOW RATE(CFS) =      76.79
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) =   7.80
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12413.00 =    2836.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12413.00 TO NODE  12414.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1649.76  DOWNSTREAM(FEET) =   1365.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1906.16   CHANNEL SLOPE =  0.1490
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.22
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.031
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.14      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     135.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.29
  AVERAGE FLOW DEPTH(FEET) =   1.18   TRAVEL TIME(MIN.) =   3.42
  Tc(MIN.) =   22.16
  SUBAREA AREA(ACRES) =    75.14       SUBAREA RUNOFF(CFS) =  117.07
  EFFECTIVE AREA(ACRES) =    118.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.8          PEAK FLOW RATE(CFS) =     185.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =  10.25
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12414.00 =    4742.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1365.78  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3038.90   CHANNEL SLOPE =  0.0963
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.788
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     286.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.07
  AVERAGE FLOW DEPTH(FEET) =   2.03   TRAVEL TIME(MIN.) =   5.03
  Tc(MIN.) =   27.19
  SUBAREA AREA(ACRES) =   151.43       SUBAREA RUNOFF(CFS) =  202.84
  EFFECTIVE AREA(ACRES) =    270.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      270.2          PEAK FLOW RATE(CFS) =     361.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.30   FLOW VELOCITY(FEET/SEC.) =  10.77
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12420.00 =    7781.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   27.19
 RAINFALL INTENSITY(INCH/HR) =   1.79
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     270.21
 TOTAL STREAM AREA(ACRES) =     270.21
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     361.95

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      931.12   31.60    1.640  0.30( 0.30) 1.00     771.8   12400.00
     2      361.95   27.19    1.788  0.30( 0.30) 1.00     270.2   12410.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1251.44   27.19    1.788  0.30( 0.30) 1.00     934.3   12410.00
     2     1257.11   31.60    1.640  0.30( 0.30) 1.00    1042.0   12400.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1257.11    Tc(MIN.) =    31.60
 EFFECTIVE AREA(ACRES) =    1042.00   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1042.0
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12420.00 TO NODE  12421.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1073.11  DOWNSTREAM(FEET) =   1005.32
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2235.12   CHANNEL SLOPE =  0.0303
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.12
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.548
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      218.57      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1379.88
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.19
 AVERAGE FLOW DEPTH(FEET) =   6.10   TRAVEL TIME(MIN.) =   3.65
 Tc(MIN.) =   35.26
 SUBAREA AREA(ACRES) =   218.57       SUBAREA RUNOFF(CFS) =  245.50
 EFFECTIVE AREA(ACRES) =   1260.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1260.6         PEAK FLOW RATE(CFS) =    1415.90
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.18

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.18   FLOW VELOCITY(FEET/SEC.) =  10.26
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12421.00 =   14417.13 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12421.00 TO NODE  12422.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1005.32  DOWNSTREAM(FEET) =    879.13
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.31   CHANNEL SLOPE =  0.0451
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.87
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.451
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      241.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1541.00
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.14
 AVERAGE FLOW DEPTH(FEET) =   5.85   TRAVEL TIME(MIN.) =   3.84
 Tc(MIN.) =   39.10
 SUBAREA AREA(ACRES) =   241.55       SUBAREA RUNOFF(CFS) =  250.17
 EFFECTIVE AREA(ACRES) =   1502.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1502.1         PEAK FLOW RATE(CFS) =    1555.75
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.88

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.88   FLOW VELOCITY(FEET/SEC.) =  12.17
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12422.00 =   17217.44 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1584.54   34.68    1.563  0.30( 0.30) 1.00    1394.4   12410.00
     2     1555.75   39.10    1.451  0.30( 0.30) 1.00    1502.1   12400.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1584.54  Tc(MIN.) =   34.68
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1394.38

****************************************************************************
 FLOW PROCESS FROM NODE  12422.00 TO NODE  12423.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    879.13  DOWNSTREAM(FEET) =    815.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.90   CHANNEL SLOPE =  0.0333
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.53
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.490
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1665.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.09
  AVERAGE FLOW DEPTH(FEET) =   6.52   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   37.57
  SUBAREA AREA(ACRES) =   151.63       SUBAREA RUNOFF(CFS) =  162.35
  EFFECTIVE AREA(ACRES) =   1546.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1653.8         PEAK FLOW RATE(CFS) =    1655.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.50   FLOW VELOCITY(FEET/SEC.) =  11.06
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12423.00 =   19136.34 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1655.31   37.57    1.490  0.30( 0.30) 1.00    1546.0   12410.00
      2     1630.66   42.00    1.396  0.30( 0.30) 1.00    1653.8   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1655.31  Tc(MIN.) =   37.57
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1546.01

******************************************************************************
  FLOW PROCESS FROM NODE  12423.00 TO NODE  12424.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    815.17  DOWNSTREAM(FEET) =    696.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2870.82   CHANNEL SLOPE =  0.0413
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.30
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.403
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      122.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1716.08
```



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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.10
  AVERAGE FLOW DEPTH(FEET) =   6.28   TRAVEL TIME(MIN.) =   3.95
  Tc(MIN.) =   41.52
  SUBAREA AREA(ACRES) =   122.40       SUBAREA RUNOFF(CFS) =  121.56
  EFFECTIVE AREA(ACRES) =   1668.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1776.2         PEAK FLOW RATE(CFS) =    1656.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.18   FLOW VELOCITY(FEET/SEC.) =  11.98
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12424.00 =   22007.16 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1656.91   41.52    1.403  0.30( 0.30) 1.00    1668.4   12410.00
      2     1648.45   45.98    1.331  0.30( 0.30) 1.00    1776.2   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1656.91  Tc(MIN.) =   41.52
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1668.41

******************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    696.54  DOWNSTREAM(FEET) =    572.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3680.45   CHANNEL SLOPE =  0.0338
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.57
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.315
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.54      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1701.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.20
  AVERAGE FLOW DEPTH(FEET) =   6.57   TRAVEL TIME(MIN.) =   5.48
  Tc(MIN.) =   47.00
  SUBAREA AREA(ACRES) =    96.54       SUBAREA RUNOFF(CFS) =   88.17
  EFFECTIVE AREA(ACRES) =   1764.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1872.7         PEAK FLOW RATE(CFS) =    1656.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.49   FLOW VELOCITY(FEET/SEC.) =  11.12
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LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1656.91	47.00	1.315	0.30(0.30)	1.00	1764.9	12410.00
2	1648.45	51.47	1.249	0.30(0.30)	1.00	1872.7	12400.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1656.91 Tc(MIN.) = 47.00
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1764.95

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 1872.7 TC(MIN.) = 47.00
EFFECTIVE AREA(ACRES) = 1764.95 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS) = 1656.91

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1656.91	47.00	1.315	0.30(0.30)	1.00	1764.9	12410.00
2	1648.45	51.47	1.249	0.30(0.30)	1.00	1872.7	12400.00

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END OF RATIONAL METHOD ANALYSIS

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S25.DAT
  TIME/DATE OF STUDY: 11:59 04/03/2013
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.550
   2)   10.00;  3.536
   3)   15.00;  2.697
   4)   20.00;  2.249
   5)   25.00;  1.940
   6)   30.00;  1.746
   7)   40.00;  1.476
   8)   50.00;  1.315
   9)   60.00;  1.216
  10)   90.00;  1.012
  11)  120.00;  0.882
  12)  180.00;  0.762
  13)  360.00;  0.568
  14) 1440.00;  0.251
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  12500.00 TO NODE  12501.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   927.04
  ELEVATION DATA: UPSTREAM(FEET) =   1638.22  DOWNSTREAM(FEET) =   1356.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.770
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.903
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        8.89      0.30     1.000     0   13.77
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     20.83
  TOTAL AREA(ACRES) =      8.89   PEAK FLOW RATE(CFS) =     20.83

 ************************************************************************
  FLOW PROCESS FROM NODE  12501.00 TO NODE  12502.00 IS CODE =  56
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1356.00  DOWNSTREAM(FEET) =   1203.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1004.73   CHANNEL SLOPE =  0.1519
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.575
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       24.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.47
  AVERAGE FLOW DEPTH(FEET) =   0.63   TRAVEL TIME(MIN.) =   2.59
  Tc(MIN.) =   16.36
  SUBAREA AREA(ACRES) =    24.30       SUBAREA RUNOFF(CFS) =   49.76
  EFFECTIVE AREA(ACRES) =     33.19     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.2          PEAK FLOW RATE(CFS) =      67.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.79   FLOW VELOCITY(FEET/SEC.) =   7.42
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12502.00 =    1931.77 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  12502.00 TO NODE  12503.00 IS CODE =  56
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1203.37  DOWNSTREAM(FEET) =    987.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.62   CHANNEL SLOPE =  0.1147
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.40
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.252
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     147.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.71
  AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =   19.96
  SUBAREA AREA(ACRES) =    90.42       SUBAREA RUNOFF(CFS) =  158.87
  EFFECTIVE AREA(ACRES) =    123.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      123.6         PEAK FLOW RATE(CFS) =     217.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.66   FLOW VELOCITY(FEET/SEC.) =   9.83
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12503.00 =    3816.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12503.00 TO NODE  12504.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    987.23  DOWNSTREAM(FEET) =    870.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1478.57   CHANNEL SLOPE =  0.0792
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.16
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.088
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     284.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.36
  AVERAGE FLOW DEPTH(FEET) =   2.13   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =   22.60
  SUBAREA AREA(ACRES) =    84.07       SUBAREA RUNOFF(CFS) =  135.32
  EFFECTIVE AREA(ACRES) =    207.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.7         PEAK FLOW RATE(CFS) =     334.28
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.32   FLOW VELOCITY(FEET/SEC.) =   9.82
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12504.00 =    5294.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12504.00 TO NODE  12505.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.07  DOWNSTREAM(FEET) =    729.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1915.52   CHANNEL SLOPE =  0.0736
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.60
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.909
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     392.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.01
  AVERAGE FLOW DEPTH(FEET) =   2.58   TRAVEL TIME(MIN.) =   3.19
  Tc(MIN.) =   25.79
  SUBAREA AREA(ACRES) =    79.84       SUBAREA RUNOFF(CFS) =  115.64
  EFFECTIVE AREA(ACRES) =    287.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      287.5         PEAK FLOW RATE(CFS) =     416.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.67   FLOW VELOCITY(FEET/SEC.) =  10.18
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12505.00 =    7210.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    729.02  DOWNSTREAM(FEET) =    549.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2961.35   CHANNEL SLOPE =  0.0605
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.00
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.724
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.77      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     466.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.79
  AVERAGE FLOW DEPTH(FEET) =   2.99   TRAVEL TIME(MIN.) =   5.04
  Tc(MIN.) =   30.83
  SUBAREA AREA(ACRES) =    78.77       SUBAREA RUNOFF(CFS) =  100.94
  EFFECTIVE AREA(ACRES) =    366.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      366.3          PEAK FLOW RATE(CFS) =     469.39
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.99   FLOW VELOCITY(FEET/SEC.) =   9.81
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12520.00 =   10171.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S23.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     5555.82   42.56  0.30( 0.29) 0.97    4414.7   12300.00
      2     5650.28   44.10  0.30( 0.29) 0.97    4644.9   12330.00
      3     6278.47   56.43  0.30( 0.29) 0.97    6361.2   12211.00
      4     6448.06   60.73  0.30( 0.29) 0.97    6957.0   12201.00
      5     6466.74   64.90  0.30( 0.29) 0.97    7431.5   12111.00
      6     6476.66   67.50  0.30( 0.29) 0.97    7743.2   12231.00
      7     6478.57   70.27  0.30( 0.29) 0.97    8043.1   12101.10
      8     6471.57   71.22  0.30( 0.29) 0.97    8134.7   12261.00
      9     6166.93   81.98  0.30( 0.29) 0.97    8890.3   12010.00
     10     5696.95   89.88  0.30( 0.29) 0.97    9014.4   12000.00
    TOTAL AREA(ACRES) =     9014.4

****************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S24.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1656.91   47.00  0.30( 0.30) 1.00    1764.9   12410.00
      2     1648.45   51.47  0.30( 0.30) 1.00    1872.7   12400.00
    TOTAL AREA(ACRES) =     1872.7
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1656.91   47.00  0.30( 0.30) 1.00    1764.9   12410.00
      2     1648.45   51.47  0.30( 0.30) 1.00    1872.7   12400.00
    TOTAL AREA(ACRES) =     1872.7

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1656.91   47.00    1.363  0.30( 0.30) 1.00    1764.9   12410.00
      2     1648.45   51.47    1.300  0.30( 0.30) 1.00    1872.7   12400.00
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12425.00 =   25687.61 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5555.82   42.56    1.435  0.30( 0.29) 0.97    4414.7   12300.00
      2     5650.28   44.10    1.410  0.30( 0.29) 0.97    4644.9   12330.00
      3     6278.47   56.43    1.251  0.30( 0.29) 0.97    6361.2   12211.00
      4     6448.06   60.73    1.211  0.30( 0.29) 0.97    6957.0   12201.00
      5     6466.74   64.90    1.183  0.30( 0.29) 0.97    7431.5   12111.00
      6     6476.66   67.50    1.165  0.30( 0.29) 0.97    7743.2   12231.00
      7     6478.57   70.27    1.146  0.30( 0.29) 0.97    8043.1   12101.10
      8     6471.57   71.22    1.140  0.30( 0.29) 0.97    8134.7   12261.00
      9     6166.93   81.98    1.067  0.30( 0.29) 0.97    8890.3   12010.00
     10     5696.95   89.88    1.013  0.30( 0.29) 0.97    9014.4   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7157.53   42.56    1.435  0.30( 0.29) 0.98    6013.1   12300.00
      2     7273.52   44.10    1.410  0.30( 0.29) 0.98    6301.1   12330.00
      3     7454.83   47.00    1.363  0.30( 0.29) 0.98    6813.2   12410.00
      4     7674.30   51.47    1.300  0.30( 0.29) 0.98    7543.7   12400.00
      5     7846.28   56.43    1.251  0.30( 0.29) 0.98    8233.9   12211.00
      6     7949.59   60.73    1.211  0.30( 0.29) 0.98    8829.7   12201.00
      7     7921.59   64.90    1.183  0.30( 0.29) 0.97    9304.2   12111.00
      8     7902.46   67.50    1.165  0.30( 0.29) 0.97    9615.9   12231.00
      9     7873.35   70.27    1.146  0.30( 0.29) 0.97    9915.8   12101.10
     10     7855.69   71.22    1.140  0.30( 0.29) 0.97   10007.4   12261.00
     11     7430.70   81.98    1.067  0.30( 0.29) 0.98   10763.0   12010.00
     12     6872.29   89.88    1.013  0.30( 0.29) 0.98   10887.1   12000.00
    TOTAL AREA(ACRES) =    10887.1
```

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 7949.59 Tc(MIN.) = 60.730
EFFECTIVE AREA(ACRES) = 8829.71 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 10887.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

****
FLOW PROCESS FROM NODE 12425.00 TO NODE 12520.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 572.29 DOWNSTREAM(FEET) = 549.92
CHANNEL LENGTH THRU SUBAREA(FEET) = 1724.25 CHANNEL SLOPE = 0.0130
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.81
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.192
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.96	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7996.94
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.28
AVERAGE FLOW DEPTH(FEET) = 9.80 TRAVEL TIME(MIN.) = 2.80
Tc(MIN.) = 63.53
SUBAREA AREA(ACRES) = 117.96 SUBAREA RUNOFF(CFS) = 94.70
EFFECTIVE AREA(ACRES) = 8947.67 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11005.0 PEAK FLOW RATE(CFS) = 7949.59
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.77 FLOW VELOCITY(FEET/SEC.) = 10.26
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7157.53	45.44	1.388	0.30(0.29)	0.98	6131.1	12300.00
2	7273.52	46.97	1.364	0.30(0.29)	0.98	6419.0	12330.00
3	7454.83	49.84	1.317	0.30(0.29)	0.98	6931.2	12410.00
4	7674.30	54.29	1.272	0.30(0.29)	0.98	7661.7	12400.00
5	7846.28	59.23	1.223	0.30(0.29)	0.98	8351.8	12211.00
6	7949.59	63.53	1.192	0.30(0.29)	0.98	8947.7	12201.00
7	7921.59	67.70	1.164	0.30(0.29)	0.97	9422.2	12111.00
8	7902.46	70.30	1.146	0.30(0.29)	0.97	9733.9	12231.00
9	7873.35	73.08	1.127	0.30(0.29)	0.97	10033.7	12101.10
10	7855.69	74.03	1.121	0.30(0.29)	0.97	10125.4	12261.00
11	7430.70	84.83	1.047	0.30(0.29)	0.98	10881.0	12010.00
12	7006.79	92.80	1.000	0.30(0.29)	0.98	11005.0	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 7949.59 Tc(MIN.) = 63.53
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 8947.67

****
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7157.53	45.44	1.388	0.30(0.29)	0.98	6131.1	12300.00
2	7273.52	46.97	1.364	0.30(0.29)	0.98	6419.0	12330.00
3	7454.83	49.84	1.317	0.30(0.29)	0.98	6931.2	12410.00
4	7674.30	54.29	1.272	0.30(0.29)	0.98	7661.7	12400.00
5	7846.28	59.23	1.223	0.30(0.29)	0.98	8351.8	12211.00
6	7949.59	63.53	1.192	0.30(0.29)	0.98	8947.7	12201.00
7	7921.59	67.70	1.164	0.30(0.29)	0.97	9422.2	12111.00
8	7902.46	70.30	1.146	0.30(0.29)	0.97	9733.9	12231.00
9	7873.35	73.08	1.127	0.30(0.29)	0.97	10033.7	12101.10
10	7855.69	74.03	1.121	0.30(0.29)	0.97	10125.4	12261.00
11	7430.70	84.83	1.047	0.30(0.29)	0.98	10881.0	12010.00
12	7006.79	92.80	1.000	0.30(0.29)	0.98	11005.0	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	469.39	30.83	1.724	0.30(0.30)	1.00	366.3	12500.00

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	30.83	1.724	0.30(0.29)	0.98	4525.5	12500.00
2	7516.29	45.44	1.388	0.30(0.29)	0.98	6497.4	12300.00
3	7624.15	46.97	1.364	0.30(0.29)	0.98	6785.3	12330.00
4	7790.13	49.84	1.317	0.30(0.29)	0.98	7297.5	12410.00
5	7994.80	54.29	1.272	0.30(0.29)	0.98	8028.0	12400.00
6	8150.71	59.23	1.223	0.30(0.29)	0.98	8718.1	12211.00
7	8243.64	63.53	1.192	0.30(0.29)	0.98	9314.0	12201.00
8	8206.30	67.70	1.164	0.30(0.29)	0.98	9788.4	12111.00
9	8181.35	70.30	1.146	0.30(0.29)	0.98	10100.2	12231.00
10	8146.02	73.08	1.127	0.30(0.29)	0.97	10400.0	12101.10
11	8126.24	74.03	1.121	0.30(0.29)	0.97	10491.7	12261.00
12	7677.07	84.83	1.047	0.30(0.29)	0.98	11247.2	12010.00
13	7237.60	92.80	1.000	0.30(0.29)	0.98	11371.3	12000.00

TOTAL AREA(ACRES) = 11371.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 8243.64 Tc(MIN.) = 63.526
EFFECTIVE AREA(ACRES) = 9313.96 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11371.3
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

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****************************************************************************
  FLOW PROCESS FROM NODE  12520.00 TO NODE  12521.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    549.92  DOWNSTREAM(FEET) =    525.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1934.41   CHANNEL SLOPE =  0.0127
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.05
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.171
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    8277.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.29
  AVERAGE FLOW DEPTH(FEET) =  10.04   TRAVEL TIME(MIN.) =   3.13
  Tc(MIN.) =   66.66
  SUBAREA AREA(ACRES) =    85.91       SUBAREA RUNOFF(CFS) =   67.32
  EFFECTIVE AREA(ACRES) =   9399.87     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    11457.2         PEAK FLOW RATE(CFS) =    8243.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.02   FLOW VELOCITY(FEET/SEC.) =  10.27
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12521.00 =   60159.12 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6814.50   34.13    1.635  0.30( 0.29) 0.98    4611.4   12500.00
      2     7516.29   48.66    1.336  0.30( 0.29) 0.98    6583.3   12300.00
      3     7624.15   50.17    1.313  0.30( 0.29) 0.98    6871.2   12330.00
      4     7790.13   53.03    1.285  0.30( 0.29) 0.98    7383.4   12410.00
      5     7994.80   57.45    1.241  0.30( 0.29) 0.98    8113.9   12400.00
      6     8150.71   62.38    1.200  0.30( 0.29) 0.98    8804.0   12211.00
      7     8243.64   66.66    1.171  0.30( 0.29) 0.98    9399.9   12201.00
      8     8206.30   70.84    1.142  0.30( 0.29) 0.98    9874.4   12111.00
      9     8181.35   73.44    1.125  0.30( 0.29) 0.98   10186.1   12231.00
     10     8146.02   76.22    1.106  0.30( 0.29) 0.97   10485.9   12101.10
     11     8126.24   77.18    1.099  0.30( 0.29) 0.97   10577.6   12261.00
     12     7677.07   88.03    1.026  0.30( 0.29) 0.98   11333.2   12010.00
     13     7237.60   96.05    0.986  0.30( 0.29) 0.98   11457.2   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    8243.64  Tc(MIN.) =   66.66
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    9399.87

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  FLOW PROCESS FROM NODE  12521.00 TO NODE  12522.00 IS CODE =  56
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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    525.43  DOWNSTREAM(FEET) =    490.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3335.01   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.71
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.131
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      539.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    8445.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.62
  AVERAGE FLOW DEPTH(FEET) =  10.69   TRAVEL TIME(MIN.) =   5.78
  Tc(MIN.) =   72.44
  SUBAREA AREA(ACRES) =   539.82       SUBAREA RUNOFF(CFS) =  403.97
  EFFECTIVE AREA(ACRES) =   9939.69     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    11997.0         PEAK FLOW RATE(CFS) =    8243.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.56   FLOW VELOCITY(FEET/SEC.) =   9.56
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12522.00 =   63494.13 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6814.50   40.20    1.473  0.30( 0.30) 0.98    5151.3   12500.00
      2     7516.29   54.58    1.269  0.30( 0.30) 0.98    7123.1   12300.00
      3     7624.15   56.06    1.255  0.30( 0.29) 0.98    7411.1   12330.00
      4     7790.13   58.89    1.227  0.30( 0.29) 0.98    7923.2   12410.00
      5     7994.80   63.28    1.194  0.30( 0.29) 0.98    8653.7   12400.00
      6     8150.71   68.17    1.160  0.30( 0.29) 0.98    9343.9   12211.00
      7     8243.64   72.44    1.131  0.30( 0.29) 0.98    9939.7   12201.00
      8     8206.30   76.62    1.103  0.30( 0.29) 0.98   10414.2   12111.00
      9     8181.35   79.23    1.085  0.30( 0.29) 0.98   10725.9   12231.00
     10     8146.02   82.02    1.066  0.30( 0.29) 0.98   11025.8   12101.10
     11     8126.24   82.98    1.060  0.30( 0.29) 0.98   11117.4   12261.00
     12     7677.07   93.93    0.995  0.30( 0.29) 0.98   11873.0   12010.00
     13     7237.60  102.05    0.960  0.30( 0.29) 0.98   11997.0   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    8243.64  Tc(MIN.) =   72.44
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    9939.69

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  FLOW PROCESS FROM NODE  12522.00 TO NODE  12523.00 IS CODE =  56
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
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  >>>>>TRAVELTIME THRU SUBAREA<<<<<
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  ELEVATION DATA: UPSTREAM(FEET) =    490.87  DOWNSTREAM(FEET) =    467.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1961.26   CHANNEL SLOPE =  0.0118
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.28
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.109
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      321.58      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    8360.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.07
  AVERAGE FLOW DEPTH(FEET) =  10.27   TRAVEL TIME(MIN.) =   3.25
  Tc(MIN.) =   75.68
  SUBAREA AREA(ACRES) =   321.58       SUBAREA RUNOFF(CFS) =  234.28
  EFFECTIVE AREA(ACRES) =  10261.27     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    12318.6         PEAK FLOW RATE(CFS) =    8243.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.20   FLOW VELOCITY(FEET/SEC.) =  10.03
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12523.00 =   65455.39 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6814.50   43.61    1.418  0.30( 0.30) 0.99    5472.8   12500.00
      2     7516.29   57.90    1.237  0.30( 0.30) 0.98    7444.7   12300.00
      3     7624.15   59.38    1.222  0.30( 0.30) 0.98    7732.6   12330.00
      4     7790.13   62.18    1.201  0.30( 0.29) 0.98    8244.8   12410.00
      5     7994.80   66.55    1.171  0.30( 0.29) 0.98    8975.3   12400.00
      6     8150.71   71.42    1.138  0.30( 0.29) 0.98    9665.4   12211.00
      7     8243.64   75.68    1.109  0.30( 0.29) 0.98   10261.3   12201.00
      8     8206.30   79.87    1.081  0.30( 0.29) 0.98   10735.8   12111.00
      9     8181.35   82.48    1.063  0.30( 0.29) 0.98   11047.5   12231.00
     10     8146.02   85.28    1.044  0.30( 0.29) 0.98   11347.3   12101.10
     11     8126.24   86.24    1.038  0.30( 0.29) 0.98   11439.0   12261.00
     12     7677.07   97.24    0.981  0.30( 0.29) 0.98   12194.6   12010.00
     13     7237.60  105.42    0.945  0.30( 0.29) 0.98   12318.6   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    8243.64  Tc(MIN.) =   75.68
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10261.27

****************************************************************************
  FLOW PROCESS FROM NODE  12523.00 TO NODE  12524.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
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  ELEVATION DATA: UPSTREAM(FEET) =    467.63  DOWNSTREAM(FEET) =    436.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2841.85   CHANNEL SLOPE =  0.0110
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.47
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.077
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      298.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    8348.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.80
  AVERAGE FLOW DEPTH(FEET) =  10.46   TRAVEL TIME(MIN.) =   4.83
  Tc(MIN.) =   80.51
  SUBAREA AREA(ACRES) =   298.62       SUBAREA RUNOFF(CFS) =  208.74
  EFFECTIVE AREA(ACRES) =  10559.89     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    12617.2         PEAK FLOW RATE(CFS) =    8243.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.39   FLOW VELOCITY(FEET/SEC.) =   9.77
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12524.00 =   68297.24 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6814.50   48.70    1.336  0.30( 0.30) 0.99    5771.5   12500.00
      2     7516.29   62.86    1.196  0.30( 0.30) 0.99    7743.3   12300.00
      3     7624.15   64.31    1.187  0.30( 0.30) 0.98    8031.3   12330.00
      4     7790.13   67.09    1.168  0.30( 0.30) 0.98    8543.4   12410.00
      5     7994.80   71.42    1.138  0.30( 0.29) 0.98    9273.9   12400.00
      6     8150.71   76.27    1.105  0.30( 0.29) 0.98    9964.1   12211.00
      7     8243.64   80.51    1.077  0.30( 0.29) 0.98   10559.9   12201.00
      8     8206.30   84.71    1.048  0.30( 0.29) 0.98   11034.4   12111.00
      9     8181.35   87.32    1.030  0.30( 0.29) 0.98   11346.1   12231.00
     10     8146.02   90.13    1.012  0.30( 0.29) 0.98   11646.0   12101.10
     11     8126.24   91.09    1.007  0.30( 0.29) 0.98   11737.6   12261.00
     12     7677.07  102.17    0.959  0.30( 0.29) 0.98   12493.2   12010.00
     13     7237.60  110.43    0.924  0.30( 0.29) 0.98   12617.2   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    8243.64  Tc(MIN.) =   80.51
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10559.89

****************************************************************************
  FLOW PROCESS FROM NODE  12524.00 TO NODE  12525.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.35  DOWNSTREAM(FEET) =    415.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2812.14   CHANNEL SLOPE =  0.0075
```

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.54
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.039
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	251.20	0.30	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8327.33
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.54
AVERAGE FLOW DEPTH(FEET) = 11.53 TRAVEL TIME(MIN.) = 5.49
Tc(MIN.) = 86.00
SUBAREA AREA(ACRES) = 251.20 SUBAREA RUNOFF(CFS) = 167.37
EFFECTIVE AREA(ACRES) = 10811.09 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 12868.4 PEAK FLOW RATE(CFS) = 8243.64
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.47 FLOW VELOCITY(FEET/SEC.) = 8.51
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12525.00 = 71109.38 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	54.48	1.270	0.30(0.30)	0.99	6022.7	12500.00
2	7516.29	68.49	1.158	0.30(0.30)	0.99	7994.5	12300.00
3	7624.15	69.92	1.149	0.30(0.30)	0.98	8282.5	12330.00
4	7790.13	72.66	1.130	0.30(0.30)	0.98	8794.6	12410.00
5	7994.80	76.96	1.101	0.30(0.29)	0.98	9525.1	12400.00
6	8150.71	81.77	1.068	0.30(0.29)	0.98	10215.3	12211.00
7	8243.64	86.00	1.039	0.30(0.29)	0.98	10811.1	12201.00
8	8206.30	90.21	1.011	0.30(0.29)	0.98	11285.6	12111.00
9	8181.35	92.82	1.000	0.30(0.29)	0.98	11597.3	12231.00
10	8146.02	95.63	0.988	0.30(0.29)	0.98	11897.2	12101.10
11	8126.24	96.60	0.984	0.30(0.29)	0.98	11988.8	12261.00
12	7677.07	107.77	0.935	0.30(0.29)	0.98	12744.4	12010.00
13	7237.60	116.12	0.899	0.30(0.29)	0.98	12868.4	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 8243.64 Tc(MIN.) = 86.00
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 10811.09

****
FLOW PROCESS FROM NODE 12525.00 TO NODE 12526.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 415.23 DOWNSTREAM(FEET) = 380.28
CHANNEL LENGTH THRU SUBAREA(FEET) = 2934.09 CHANNEL SLOPE = 0.0119
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

*ESTIMATED CHANNEL HEIGHT(FEET) = 7.31
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.005
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	247.71	0.30	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8322.72
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.82
AVERAGE FLOW DEPTH(FEET) = 7.30 TRAVEL TIME(MIN.) = 5.55
Tc(MIN.) = 91.55
SUBAREA AREA(ACRES) = 247.71 SUBAREA RUNOFF(CFS) = 158.17
EFFECTIVE AREA(ACRES) = 11058.80 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 13116.2 PEAK FLOW RATE(CFS) = 8243.64
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.27 FLOW VELOCITY(FEET/SEC.) = 8.79
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12526.00 = 74043.48 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	60.37	1.213	0.30(0.30)	0.99	6270.4	12500.00
2	7516.29	74.19	1.119	0.30(0.30)	0.99	8242.2	12300.00
3	7624.15	75.60	1.110	0.30(0.30)	0.98	8530.2	12330.00
4	7790.13	78.31	1.092	0.30(0.30)	0.98	9042.3	12410.00
5	7994.80	82.55	1.063	0.30(0.29)	0.98	9772.8	12400.00
6	8150.71	87.34	1.030	0.30(0.29)	0.98	10463.0	12211.00
7	8243.64	91.55	1.005	0.30(0.29)	0.98	11058.8	12201.00
8	8206.30	95.76	0.987	0.30(0.29)	0.98	11533.3	12111.00
9	8181.35	98.39	0.976	0.30(0.29)	0.98	11845.0	12231.00
10	8146.02	101.20	0.964	0.30(0.29)	0.98	12144.9	12101.10
11	8126.24	102.17	0.959	0.30(0.29)	0.98	12236.5	12261.00
12	7677.07	113.44	0.911	0.30(0.29)	0.98	12992.1	12010.00
13	7237.60	121.90	0.878	0.30(0.29)	0.98	13116.2	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 8243.64 Tc(MIN.) = 91.55
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 11058.80

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 380.28 DOWNSTREAM(FEET) = 347.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 3113.51 CHANNEL SLOPE = 0.0105
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.54
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.979

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	120.94	0.30	0.974	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.974
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   8281.01
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.44
AVERAGE FLOW DEPTH(FEET) =   7.53   TRAVEL TIME(MIN.) =   6.14
Tc(MIN.) =   97.69
SUBAREA AREA(ACRES) =   120.94   SUBAREA RUNOFF(CFS) =   74.75
EFFECTIVE AREA(ACRES) = 11179.74   AREA-AVERAGED Fm(INCH/HR) =   0.29
AREA-AVERAGED Fp(INCH/HR) =   0.30 AREA-AVERAGED Ap =   0.98
TOTAL AREA(ACRES) =   13237.1   PEAK FLOW RATE(CFS) =   8243.64
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00   CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   7.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.52   FLOW VELOCITY(FEET/SEC.) =   8.43
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 =   77156.98 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	66.89	1.169	0.30(0.30)	0.99	6391.3	12500.00
2	7516.29	80.52	1.077	0.30(0.30)	0.99	8363.2	12300.00
3	7624.15	81.90	1.067	0.30(0.30)	0.98	8651.1	12330.00
4	7790.13	84.56	1.049	0.30(0.30)	0.98	9163.3	12410.00
5	7994.80	88.76	1.021	0.30(0.29)	0.98	9893.7	12400.00
6	8150.71	93.51	0.997	0.30(0.29)	0.98	10583.9	12211.00
7	8243.64	97.69	0.979	0.30(0.29)	0.98	11179.7	12201.00
8	8206.30	101.91	0.961	0.30(0.29)	0.98	11654.2	12111.00
9	8181.35	104.55	0.949	0.30(0.29)	0.98	11966.0	12231.00
10	8146.02	107.37	0.937	0.30(0.29)	0.98	12265.8	12101.10
11	8126.24	108.35	0.933	0.30(0.29)	0.98	12357.5	12261.00
12	7677.07	119.73	0.883	0.30(0.29)	0.98	13113.0	12010.00
13	7237.60	128.31	0.865	0.30(0.29)	0.98	13237.1	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =   8243.64 Tc(MIN.) =   97.69
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) =   11179.74

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES)   =   13237.1 TC(MIN.) =   97.69
EFFECTIVE AREA(ACRES) = 11179.74 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.980
PEAK FLOW RATE(CFS)   =   8243.64

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	66.89	1.169	0.30(0.30)	0.99	6391.3	12500.00
2	7516.29	80.52	1.077	0.30(0.30)	0.99	8363.2	12300.00
3	7624.15	81.90	1.067	0.30(0.30)	0.98	8651.1	12330.00
4	7790.13	84.56	1.049	0.30(0.30)	0.98	9163.3	12410.00
5	7994.80	88.76	1.021	0.30(0.29)	0.98	9893.7	12400.00

6	8150.71	93.51	0.997	0.30(0.29)	0.98	10583.9	12211.00
7	8243.64	97.69	0.979	0.30(0.29)	0.98	11179.7	12201.00
8	8206.30	101.91	0.961	0.30(0.29)	0.98	11654.2	12111.00
9	8181.35	104.55	0.949	0.30(0.29)	0.98	11966.0	12231.00
10	8146.02	107.37	0.937	0.30(0.29)	0.98	12265.8	12101.10
11	8126.24	108.35	0.933	0.30(0.29)	0.98	12357.5	12261.00
12	7677.07	119.73	0.883	0.30(0.29)	0.98	13113.0	12010.00
13	7237.60	128.31	0.865	0.30(0.29)	0.98	13237.1	12000.00

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:
```

FILE NAME: S26.DAT
TIME/DATE OF STUDY: 09:44 09/12/2017

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
USER-DEFINED TABLED RAINFALL USED
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	5.513
2)	10.00;	3.519
3)	15.00;	2.687
4)	20.00;	2.242
5)	25.00;	1.935
6)	30.00;	1.741
7)	40.00;	1.473
8)	50.00;	1.311
9)	60.00;	1.211
10)	90.00;	1.007
11)	120.00;	0.877
12)	180.00;	0.757
13)	360.00;	0.563
14)	1200.00;	0.248

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: S19.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21915.10	16.86	0.30(0.30)	0.99	5989.8	40200.00
2	25697.26	31.22	0.30(0.30)	0.99	11187.2	40100.00
3	27506.13	40.84	0.30(0.30)	0.99	14499.0	11801.00
4	29742.04	52.15	0.30(0.30)	0.99	19078.8	11530.00
5	30871.96	56.78	0.30(0.30)	0.99	21396.8	11701.00
6	31813.21	60.43	0.30(0.30)	0.99	23465.7	11910.00
7	34630.52	71.18	0.30(0.30)	0.99	30185.2	10800.00
8	35384.44	75.55	0.30(0.30)	0.99	33128.0	11130.00
9	35549.02	85.15	0.30(0.30)	0.99	38166.7	12410.00
10	35469.49	88.03	0.30(0.30)	0.99	39548.1	10600.00
11	35364.94	93.38	0.30(0.30)	0.99	41908.8	11201.00
12	35132.55	98.29	0.30(0.30)	0.99	43638.6	12201.00
13	34868.52	101.00	0.30(0.30)	0.99	44429.0	10410.00
14	34337.37	105.14	0.30(0.30)	0.99	45493.9	12231.00
15	33972.47	107.97	0.30(0.30)	0.99	46170.2	12101.10
16	33257.06	112.69	0.30(0.30)	0.99	47130.3	10400.00
17	32108.15	120.34	0.30(0.30)	0.99	48424.9	12010.00
18	31078.39	126.05	0.30(0.30)	0.99	48773.5	10210.00
19	30642.96	128.93	0.30(0.30)	0.99	48889.0	12000.00
20	27598.74	153.21	0.30(0.30)	0.99	49511.8	10100.00

TOTAL AREA(ACRES) = 49511.8

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FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 14.0

>>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

==========

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21915.10	16.86	0.30(0.30)	0.99	5989.8	40200.00
2	25697.26	31.22	0.30(0.30)	0.99	11187.2	40100.00
3	27506.13	40.84	0.30(0.30)	0.99	14499.0	11801.00
4	29742.04	52.15	0.30(0.30)	0.99	19078.8	11530.00
5	30871.96	56.78	0.30(0.30)	0.99	21396.8	11701.00
6	31813.21	60.43	0.30(0.30)	0.99	23465.7	11910.00
7	34630.52	71.18	0.30(0.30)	0.99	30185.2	10800.00
8	35384.44	75.55	0.30(0.30)	0.99	33128.0	11130.00
9	35549.02	85.15	0.30(0.30)	0.99	38166.7	12410.00
10	35469.49	88.03	0.30(0.30)	0.99	39548.1	10600.00
11	35364.94	93.38	0.30(0.30)	0.99	41908.8	11201.00
12	35132.55	98.29	0.30(0.30)	0.99	43638.6	12201.00
13	34868.52	101.00	0.30(0.30)	0.99	44429.0	10410.00
14	34337.37	105.14	0.30(0.30)	0.99	45493.9	12231.00
15	33972.47	107.97	0.30(0.30)	0.99	46170.2	12101.10
16	33257.06	112.69	0.30(0.30)	0.99	47130.3	10400.00
17	32108.15	120.34	0.30(0.30)	0.99	48424.9	12010.00
18	31078.39	126.05	0.30(0.30)	0.99	48773.5	10210.00

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     19    30642.96  128.93  0.30( 0.30) 0.99   48889.0   12000.00
     20    27598.74  153.21  0.30( 0.30) 0.99   49511.8   10100.00
    TOTAL AREA(ACRES) =     49511.8

****************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  12601.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    341.63  DOWNSTREAM(FEET) =    325.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1467.93   CHANNEL SLOPE =  0.0113
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.89
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.031
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.11      0.30     0.992     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   35553.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.81
  AVERAGE FLOW DEPTH(FEET) =   7.89   TRAVEL TIME(MIN.) =   1.30
  Tc(MIN.) =   86.45
  SUBAREA AREA(ACRES) =    14.11       SUBAREA RUNOFF(CFS) =    9.32
  EFFECTIVE AREA(ACRES) =  38180.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    49525.9         PEAK FLOW RATE(CFS) =   35549.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.89   FLOW VELOCITY(FEET/SEC.) =  18.81
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610318X.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      218.36   16.78  0.30( 0.30) 1.00     108.9   31800.00
      2      206.21   20.27  0.30( 0.30) 1.00     119.0   31810.00
    TOTAL AREA(ACRES) =      119.0

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```



```
** MAIN STREAM CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    21915.10   18.39    2.385  0.30( 0.30) 0.99    6003.9   40200.00
    2    25697.26   32.67    1.669  0.30( 0.30) 0.99   11201.3   40100.00
    3    27506.13   42.26    1.436  0.30( 0.30) 0.99   14513.1   11801.00
    4    29742.04   53.54    1.276  0.30( 0.30) 0.99   19092.9   11530.00
    5    30871.96   58.14    1.230  0.30( 0.30) 0.99   21410.9   11701.00
    6    31813.21   61.78    1.199  0.30( 0.30) 0.99   23479.9   11910.00
    7    34630.52   72.49    1.126  0.30( 0.30) 0.99   30199.4   10800.00
    8    35384.44   76.86    1.096  0.30( 0.30) 0.99   33142.1   11130.00
    9    35549.02   86.45    1.031  0.30( 0.30) 0.99   38180.8   12410.00
   10    35469.49   89.33    1.012  0.30( 0.30) 0.99   39562.3   10600.00
   11    35364.94   94.69    0.987  0.30( 0.30) 0.99   41923.0   11201.00
   12    35132.55   99.59    0.965  0.30( 0.30) 0.99   43652.7   12201.00
   13    34868.52  102.31    0.954  0.30( 0.30) 0.99   44443.2   10410.00
   14    34337.37  106.46    0.936  0.30( 0.30) 0.99   45508.0   12231.00
   15    33972.47  109.29    0.923  0.30( 0.30) 0.99   46184.3   12101.10
   16    33257.06  114.02    0.903  0.30( 0.30) 0.99   47144.4   10400.00
   17    32108.15  121.69    0.874  0.30( 0.30) 0.99   48439.0   12010.00
   18    31078.39  127.41    0.862  0.30( 0.30) 0.99   48787.7   10210.00
   19    30642.96  130.29    0.856  0.30( 0.30) 0.99   48903.1   12000.00
   20    27598.74  154.62    0.808  0.30( 0.30) 0.99   49525.9   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      218.36   16.78    2.529  0.30( 0.30) 1.00     108.9   31800.00
    2      206.21   20.27    2.225  0.30( 0.30) 1.00     119.0   31810.00
LONGEST FLOWPATH FROM NODE  31810.00 TO NODE  12601.00 =    4599.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    21586.81   16.78    2.529  0.30( 0.30) 0.99    5586.6   31800.00
    2    22127.85   18.39    2.385  0.30( 0.30) 0.99    6117.5   40200.00
    3    22618.88   20.27    2.225  0.30( 0.30) 0.99    6806.7   31810.00
    4    25843.91   32.67    1.669  0.30( 0.30) 0.99   11320.4   40100.00
    5    27627.84   42.26    1.436  0.30( 0.30) 0.99   14632.2   11801.00
    6    29846.53   53.54    1.276  0.30( 0.30) 0.99   19211.9   11530.00
    7    30971.52   58.14    1.230  0.30( 0.30) 0.99   21529.9   11701.00
    8    31909.48   61.78    1.199  0.30( 0.30) 0.99   23598.9   11910.00
    9    34718.98   72.49    1.126  0.30( 0.30) 0.99   30318.4   10800.00
   10    35469.73   76.86    1.096  0.30( 0.30) 0.99   33261.1   11130.00
   11    35627.32   86.45    1.031  0.30( 0.30) 0.99   38299.9   12410.00
   12    35545.70   89.33    1.012  0.30( 0.30) 0.99   39681.3   10600.00
   13    35438.49   94.69    0.987  0.30( 0.30) 0.99   42042.0   11201.00
   14    35203.82   99.59    0.965  0.30( 0.30) 0.99   43771.7   12201.00
   15    34938.52  102.31    0.954  0.30( 0.30) 0.99   44562.2   10410.00
   16    34405.45  106.46    0.936  0.30( 0.30) 0.99   45627.1   12231.00
   17    34039.24  109.29    0.923  0.30( 0.30) 0.99   46303.3   12101.10
   18    33321.63  114.02    0.903  0.30( 0.30) 0.99   47263.5   10400.00
   19    32169.59  121.69    0.874  0.30( 0.30) 0.99   48558.0   12010.00
   20    31138.60  127.41    0.862  0.30( 0.30) 0.99   48906.7   10210.00
   21    30702.56  130.29    0.856  0.30( 0.30) 0.99   49022.2   12000.00
   22    27653.12  154.62    0.808  0.30( 0.30) 0.99   49644.9   10100.00
  TOTAL AREA(ACRES) =     49644.9
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    35627.32  Tc(MIN.) =   86.454
  EFFECTIVE AREA(ACRES) =  38299.86  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49644.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12602.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    325.00  DOWNSTREAM(FEET) =    313.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1377.46   CHANNEL SLOPE =  0.0087
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.52
  CHANNEL FLOW THRU SUBAREA(CFS) =   35627.32
  FLOW VELOCITY(FEET/SEC.) =  17.24   FLOW DEPTH(FEET) =   8.52
  TRAVEL TIME(MIN.) =   1.33   Tc(MIN.) =   87.79
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12602.00 =  101245.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12602.00 TO NODE  12603.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    313.00  DOWNSTREAM(FEET) =    310.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   312.40   CHANNEL SLOPE =  0.0096
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.28
  CHANNEL FLOW THRU SUBAREA(CFS) =   35627.32
  FLOW VELOCITY(FEET/SEC.) =  17.82   FLOW DEPTH(FEET) =   8.28
  TRAVEL TIME(MIN.) =   0.29   Tc(MIN.) =   88.08
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12602.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610317X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      127.68   16.60  0.30( 0.30) 1.00      63.2   31700.00
      2      124.08   20.12  0.30( 0.30) 1.00      71.3   31710.00
    TOTAL AREA(ACRES) =       71.3
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    21586.81   18.70    2.358  0.30( 0.30) 0.99    5586.6   31800.00
      2    22127.85   20.30    2.224  0.30( 0.30) 0.99    6117.5   40200.00
      3    22618.88   22.16    2.109  0.30( 0.30) 0.99    6806.7   31810.00
      4    25843.91   34.48    1.621  0.30( 0.30) 0.99   11320.4   40100.00
      5    27627.84   44.02    1.408  0.30( 0.30) 0.99   14632.2   11801.00
      6    29846.53   55.26    1.258  0.30( 0.30) 0.99   19211.9   11530.00
      7    30971.52   59.84    1.213  0.30( 0.30) 0.99   21529.9   11701.00
      8    31909.48   63.46    1.187  0.30( 0.30) 0.99   23598.9   11910.00
      9    34718.98   74.13    1.115  0.30( 0.30) 0.99   30318.4   10800.00
     10    35469.73   78.48    1.085  0.30( 0.30) 0.99   33261.1   11130.00
     11    35627.32   88.08    1.020  0.30( 0.30) 0.99   38299.9   12410.00
     12    35545.70   90.96    1.003  0.30( 0.30) 0.99   39681.3   10600.00
     13    35438.49   96.31    0.980  0.30( 0.30) 0.99   42042.0   11201.00
     14    35203.82  101.22    0.958  0.30( 0.30) 0.99   43771.7   12201.00
     15    34938.52  103.94    0.947  0.30( 0.30) 0.99   44562.2   10410.00
     16    34405.45  108.10    0.929  0.30( 0.30) 0.99   45627.1   12231.00
     17    34039.24  110.94    0.916  0.30( 0.30) 0.99   46303.3   12101.10
     18    33321.63  115.68    0.896  0.30( 0.30) 0.99   47263.5   10400.00
     19    32169.59  123.37    0.870  0.30( 0.30) 0.99   48558.0   12010.00
     20    31138.60  129.10    0.859  0.30( 0.30) 0.99   48906.7   10210.00
     21    30702.56  132.00    0.853  0.30( 0.30) 0.99   49022.2   12000.00
     22    27653.12  156.39    0.804  0.30( 0.30) 0.99   49644.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      127.68   16.60    2.544  0.30( 0.30) 1.00      63.2   31700.00
      2      124.08   20.12    2.235  0.30( 0.30) 1.00      71.3   31710.00
  LONGEST FLOWPATH FROM NODE  31710.00 TO NODE  12603.00 =    3633.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    21030.82   16.60    2.544  0.30( 0.30) 0.99    5023.6   31700.00
      2    21712.34   18.70    2.358  0.30( 0.30) 0.99    5654.6   31800.00
      3    22190.98   20.12    2.235  0.30( 0.30) 0.99    6128.9   31710.00
      4    22251.22   20.30    2.224  0.30( 0.30) 0.99    6188.7   40200.00
      5    22734.91   22.16    2.109  0.30( 0.30) 0.99    6877.9   31810.00
      6    25928.62   34.48    1.621  0.30( 0.30) 0.99   11391.6   40100.00
      7    27698.89   44.02    1.408  0.30( 0.30) 0.99   14703.4   11801.00
      8    29907.99   55.26    1.258  0.30( 0.30) 0.99   19283.2   11530.00
      9    31030.05   59.84    1.213  0.30( 0.30) 0.99   21601.2   11701.00
     10    31966.40   63.46    1.187  0.30( 0.30) 0.99   23670.1   11910.00
     11    34771.25   74.13    1.115  0.30( 0.30) 0.99   30389.7   10800.00
     12    35520.09   78.48    1.085  0.30( 0.30) 0.99   33332.4   11130.00
     13    35673.50   88.08    1.020  0.30( 0.30) 0.99   38371.1   12410.00
     14    35590.77   90.96    1.003  0.30( 0.30) 0.99   39752.6   10600.00
```

```
    15    35482.07   96.31    0.980  0.30( 0.30) 0.99   42113.2   11201.00
    16    35246.05  101.22    0.958  0.30( 0.30) 0.99   43843.0   12201.00
    17    34979.99  103.94    0.947  0.30( 0.30) 0.99   44633.5   10410.00
    18    34445.76  108.10    0.929  0.30( 0.30) 0.99   45698.3   12231.00
    19    34078.76  110.94    0.916  0.30( 0.30) 0.99   46374.6   12101.10
    20    33359.84  115.68    0.896  0.30( 0.30) 0.99   47334.7   10400.00
    21    32206.16  123.37    0.870  0.30( 0.30) 0.99   48629.3   12010.00
    22    31174.44  129.10    0.859  0.30( 0.30) 0.99   48978.0   10210.00
    23    30738.03  132.00    0.853  0.30( 0.30) 0.99   49093.4   12000.00
    24    27685.46  156.39    0.804  0.30( 0.30) 0.99   49716.2   10100.00
   TOTAL AREA(ACRES) =     49716.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    35673.50  Tc(MIN.) =   88.078
  EFFECTIVE AREA(ACRES) =  38371.13  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49716.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610403X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      322.28   18.95  0.30( 0.29) 0.97     175.0   40300.00
    TOTAL AREA(ACRES) =      175.0

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    21030.82   16.60    2.544  0.30( 0.30) 0.99    5023.6   31700.00
      2    21712.34   18.70    2.358  0.30( 0.30) 0.99    5654.6   31800.00
      3    22190.98   20.12    2.235  0.30( 0.30) 0.99    6128.9   31710.00
      4    22251.22   20.30    2.224  0.30( 0.30) 0.99    6188.7   40200.00
      5    22734.91   22.16    2.109  0.30( 0.30) 0.99    6877.9   31810.00
      6    25928.62   34.48    1.621  0.30( 0.30) 0.99   11391.6   40100.00
      7    27698.89   44.02    1.408  0.30( 0.30) 0.99   14703.4   11801.00
      8    29907.99   55.26    1.258  0.30( 0.30) 0.99   19283.2   11530.00
      9    31030.05   59.84    1.213  0.30( 0.30) 0.99   21601.2   11701.00
     10    31966.40   63.46    1.187  0.30( 0.30) 0.99   23670.1   11910.00
     11    34771.25   74.13    1.115  0.30( 0.30) 0.99   30389.7   10800.00
     12    35520.09   78.48    1.085  0.30( 0.30) 0.99   33332.4   11130.00
```



```
     13    35673.50   88.08    1.020  0.30( 0.30) 0.99   38371.1   12410.00
     14    35590.77   90.96    1.003  0.30( 0.30) 0.99   39752.6   10600.00
     15    35482.07   96.31    0.980  0.30( 0.30) 0.99   42113.2   11201.00
     16    35246.05  101.22    0.958  0.30( 0.30) 0.99   43843.0   12201.00
     17    34979.99  103.94    0.947  0.30( 0.30) 0.99   44633.5   10410.00
     18    34445.76  108.10    0.929  0.30( 0.30) 0.99   45698.3   12231.00
     19    34078.76  110.94    0.916  0.30( 0.30) 0.99   46374.6   12101.10
     20    33359.84  115.68    0.896  0.30( 0.30) 0.99   47334.7   10400.00
     21    32206.16  123.37    0.870  0.30( 0.30) 0.99   48629.3   12010.00
     22    31174.44  129.10    0.859  0.30( 0.30) 0.99   48978.0   10210.00
     23    30738.03  132.00    0.853  0.30( 0.30) 0.99   49093.4   12000.00
     24    27685.46  156.39    0.804  0.30( 0.30) 0.99   49716.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      322.28   18.95    2.336  0.30( 0.29) 0.97     175.0   40300.00
  LONGEST FLOWPATH FROM NODE  40300.00 TO NODE  12603.00 =    5256.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    21342.02   16.60    2.544  0.30( 0.30) 0.99    5177.0   31700.00
      2    22033.83   18.70    2.358  0.30( 0.30) 0.99    5827.4   31800.00
      3    22118.15   18.95    2.336  0.30( 0.30) 0.99    5912.5   40300.00
      4    22497.38   20.12    2.235  0.30( 0.30) 0.99    6304.0   31710.00
      5    22555.89   20.30    2.224  0.30( 0.30) 0.99    6363.8   40200.00
      6    23021.54   22.16    2.109  0.30( 0.30) 0.99    7053.0   31810.00
      7    26138.33   34.48    1.621  0.30( 0.30) 0.99   11566.7   40100.00
      8    27875.03   44.02    1.408  0.30( 0.30) 0.99   14878.5   11801.00
      9    30060.60   55.26    1.258  0.30( 0.30) 0.99   19458.3   11530.00
     10    31175.44   59.84    1.213  0.30( 0.30) 0.99   21776.2   11701.00
     11    32107.83   63.46    1.187  0.30( 0.30) 0.99   23845.2   11910.00
     12    34901.25   74.13    1.115  0.30( 0.30) 0.99   30564.7   10800.00
     13    35645.44   78.48    1.085  0.30( 0.30) 0.99   33507.4   11130.00
     14    35788.57   88.08    1.020  0.30( 0.30) 0.99   38546.2   12410.00
     15    35703.13   90.96    1.003  0.30( 0.30) 0.99   39927.6   10600.00
     16    35590.78   96.31    0.980  0.30( 0.30) 0.99   42288.3   11201.00
     17    35351.40  101.22    0.958  0.30( 0.30) 0.99   44018.0   12201.00
     18    35083.49  103.94    0.947  0.30( 0.30) 0.99   44808.5   10410.00
     19    34546.42  108.10    0.929  0.30( 0.30) 0.99   45873.4   12231.00
     20    34177.48  110.94    0.916  0.30( 0.30) 0.99   46549.6   12101.10
     21    33455.32  115.68    0.896  0.30( 0.30) 0.99   47509.8   10400.00
     22    32297.64  123.37    0.870  0.30( 0.30) 0.99   48804.3   12010.00
     23    31264.11  129.10    0.859  0.30( 0.30) 0.99   49153.0   10210.00
     24    30826.78  132.00    0.853  0.30( 0.30) 0.99   49268.5   12000.00
     25    27766.53  156.39    0.804  0.30( 0.30) 0.99   49891.2   10100.00
   TOTAL AREA(ACRES) =     49891.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    35788.57  Tc(MIN.) =   88.078
  EFFECTIVE AREA(ACRES) =  38546.18  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49891.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  12603.00 TO NODE  12604.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    310.00  DOWNSTREAM(FEET) =    307.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   459.69   CHANNEL SLOPE =  0.0065
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.27
 CHANNEL FLOW THRU SUBAREA(CFS) =   35788.57
 FLOW VELOCITY(FEET/SEC.) =  15.68   FLOW DEPTH(FEET) =   9.27
 TRAVEL TIME(MIN.) =   0.49   Tc(MIN.) =   88.57
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12604.00 =  102017.99 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12603.00 TO NODE  12604.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12604.00 TO NODE  12605.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    307.00  DOWNSTREAM(FEET) =    305.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   427.54   CHANNEL SLOPE =  0.0047
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.18
 CHANNEL FLOW THRU SUBAREA(CFS) =   35788.57
 FLOW VELOCITY(FEET/SEC.) =  14.01   FLOW DEPTH(FEET) =  10.18
 TRAVEL TIME(MIN.) =   0.51   Tc(MIN.) =   89.08
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.00 =  102445.53 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12604.00 TO NODE  12605.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
 ***MEMORY BANK #  3 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
 FLOW PROCESS FROM NODE  12605.00 TO NODE  12605.30 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    305.00  DOWNSTREAM(FEET) =    302.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   217.28   CHANNEL SLOPE =  0.0138
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.49
 CHANNEL FLOW THRU SUBAREA(CFS) =   35788.57
 FLOW VELOCITY(FEET/SEC.) =  20.13   FLOW DEPTH(FEET) =   7.49
 TRAVEL TIME(MIN.) =   0.18   Tc(MIN.) =   89.26
```



```
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
 ***MEMORY BANK #  3 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
 FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610404X.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      762.60   17.82  0.30( 0.30) 0.99     396.2   40430.00
     2      753.57   18.38  0.30( 0.30) 0.99     400.8   40440.00
     3      731.89   19.53  0.30( 0.30) 0.99     409.4   40400.00
     4      727.71   19.70  0.30( 0.30) 0.99     410.2   40420.00
     5      726.10   19.76  0.30( 0.30) 0.99     410.5   40410.00
   TOTAL AREA(ACRES) =      410.5

****************************************************************************
 FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    21342.02   18.00    2.420  0.30( 0.30) 0.99    5177.0   31700.00
     2    22033.83   20.08    2.237  0.30( 0.30) 0.99    5827.4   31800.00
     3    22118.15   20.33    2.222  0.30( 0.30) 0.99    5912.5   40300.00
     4    22497.38   21.49    2.150  0.30( 0.30) 0.99    6304.0   31710.00
     5    22555.89   21.67    2.139  0.30( 0.30) 0.99    6363.8   40200.00
     6    23021.54   23.52    2.026  0.30( 0.30) 0.99    7053.0   31810.00
     7    26138.33   35.79    1.586  0.30( 0.30) 0.99   11566.7   40100.00
     8    27875.03   45.30    1.387  0.30( 0.30) 0.99   14878.5   11801.00
     9    30060.60   56.51    1.246  0.30( 0.30) 0.99   19458.3   11530.00
    10    31175.44   61.07    1.204  0.30( 0.30) 0.99   21776.2   11701.00
    11    32107.83   64.68    1.179  0.30( 0.30) 0.99   23845.2   11910.00
    12    34901.25   75.32    1.107  0.30( 0.30) 0.99   30564.7   10800.00
    13    35645.44   79.66    1.077  0.30( 0.30) 0.99   33507.4   11130.00
    14    35788.57   89.26    1.012  0.30( 0.30) 0.99   38546.2   12410.00
    15    35703.13   92.13    0.998  0.30( 0.30) 0.99   39927.6   10600.00
    16    35590.78   97.49    0.975  0.30( 0.30) 0.99   42288.3   11201.00
    17    35351.40  102.40    0.953  0.30( 0.30) 0.99   44018.0   12201.00
    18    35083.49  105.13    0.941  0.30( 0.30) 0.99   44808.5   10410.00
    19    34546.42  109.29    0.923  0.30( 0.30) 0.99   45873.4   12231.00
    20    34177.48  112.14    0.911  0.30( 0.30) 0.99   46549.6   12101.10
    21    33455.32  116.89    0.890  0.30( 0.30) 0.99   47509.8   10400.00
    22    32297.64  124.58    0.868  0.30( 0.30) 0.99   48804.3   12010.00
    23    31264.11  130.34    0.856  0.30( 0.30) 0.99   49153.0   10210.00
    24    30826.78  133.24    0.851  0.30( 0.30) 0.99   49268.5   12000.00
```

```
   25    27766.53  157.67    0.802  0.30( 0.30) 0.99   49891.2   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      762.60   17.82    2.436  0.30( 0.30) 0.99     396.2   40430.00
    2      753.57   18.38    2.387  0.30( 0.30) 0.99     400.8   40440.00
    3      731.89   19.53    2.284  0.30( 0.30) 0.99     409.4   40400.00
    4      727.71   19.70    2.269  0.30( 0.30) 0.99     410.2   40420.00
    5      726.10   19.76    2.263  0.30( 0.30) 0.99     410.5   40410.00
LONGEST FLOWPATH FROM NODE  40400.00 TO NODE  12605.30 =    7428.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    22048.36   17.82    2.436  0.30( 0.30) 0.99    5519.1   40430.00
    2    22101.59   18.00    2.420  0.30( 0.30) 0.99    5574.7   31700.00
    3    22219.31   18.38    2.387  0.30( 0.30) 0.99    5694.1   40440.00
    4    22579.79   19.53    2.284  0.30( 0.30) 0.99    6062.0   40400.00
    5    22633.42   19.70    2.269  0.30( 0.30) 0.99    6117.2   40420.00
    6    22651.91   19.76    2.263  0.30( 0.30) 0.99    6136.3   40410.00
    7    22750.12   20.08    2.237  0.30( 0.30) 0.99    6237.9   31800.00
    8    22828.87   20.33    2.222  0.30( 0.30) 0.99    6322.9   40300.00
    9    23181.79   21.49    2.150  0.30( 0.30) 0.99    6714.4   31710.00
   10    23236.24   21.67    2.139  0.30( 0.30) 0.99    6774.2   40200.00
   11    23659.84   23.52    2.026  0.30( 0.30) 0.99    7463.5   31810.00
   12    26614.24   35.79    1.586  0.30( 0.30) 0.99   11977.1   40100.00
   13    28277.52   45.30    1.387  0.30( 0.30) 0.99   15288.9   11801.00
   14    30410.95   56.51    1.246  0.30( 0.30) 0.99   19868.7   11530.00
   15    31510.19   61.07    1.204  0.30( 0.30) 0.99   22186.7   11701.00
   16    32433.53   64.68    1.179  0.30( 0.30) 0.99   24255.7   11910.00
   17    35200.23   75.32    1.107  0.30( 0.30) 0.99   30975.2   10800.00
   18    35933.51   79.66    1.077  0.30( 0.30) 0.99   33917.9   11130.00
   19    36052.55   89.26    1.012  0.30( 0.30) 0.99   38956.6   12410.00
   20    35961.82   92.13    0.998  0.30( 0.30) 0.99   40338.1   10600.00
   21    35840.89   97.49    0.975  0.30( 0.30) 0.99   42698.8   11201.00
   22    35593.65  102.40    0.953  0.30( 0.30) 0.99   44428.5   12201.00
   23    35321.38  105.13    0.941  0.30( 0.30) 0.99   45219.0   10410.00
   24    34777.65  109.29    0.923  0.30( 0.30) 0.99   46283.8   12231.00
   25    34404.16  112.14    0.911  0.30( 0.30) 0.99   46960.1   12101.10
   26    33674.40  116.89    0.890  0.30( 0.30) 0.99   47920.2   10400.00
   27    32508.35  124.58    0.868  0.30( 0.30) 0.99   49214.8   12010.00
   28    31470.56  130.34    0.856  0.30( 0.30) 0.99   49563.5   10210.00
   29    31031.10  133.24    0.851  0.30( 0.30) 0.99   49679.0   12000.00
   30    27952.80  157.67    0.802  0.30( 0.30) 0.99   50301.7   10100.00
  TOTAL AREA(ACRES) =     50301.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    36052.55  Tc(MIN.) =   89.255
 EFFECTIVE AREA(ACRES) =  38956.64  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    50301.7
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.60 IS CODE =  56
----------------------------------------------------------------------------
```



```
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    302.00  DOWNSTREAM(FEET) =    295.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   738.76   CHANNEL SLOPE =  0.0095
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.37
 CHANNEL FLOW THRU SUBAREA(CFS) =   36052.55
 FLOW VELOCITY(FEET/SEC.) =  17.80   FLOW DEPTH(FEET) =   8.37
 TRAVEL TIME(MIN.) =   0.69   Tc(MIN.) =   89.95
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.60 =  103401.57 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610405X.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      178.01   13.93  0.30( 0.30) 1.00      77.1   40510.00
     2      172.23   15.40  0.30( 0.30) 1.00      81.4   40500.00
   TOTAL AREA(ACRES) =       81.4

****************************************************************************
 FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    22048.36   18.63    2.364  0.30( 0.30) 0.99    5519.1   40430.00
     2    22101.59   18.82    2.347  0.30( 0.30) 0.99    5574.7   31700.00
     3    22219.31   19.19    2.314  0.30( 0.30) 0.99    5694.1   40440.00
     4    22579.79   20.34    2.221  0.30( 0.30) 0.99    6062.0   40400.00
     5    22633.42   20.51    2.211  0.30( 0.30) 0.99    6117.2   40420.00
     6    22651.91   20.57    2.207  0.30( 0.30) 0.99    6136.3   40410.00
     7    22750.12   20.89    2.187  0.30( 0.30) 0.99    6237.9   31800.00
     8    22828.87   21.14    2.172  0.30( 0.30) 0.99    6322.9   40300.00
     9    23181.79   22.29    2.101  0.30( 0.30) 0.99    6714.4   31710.00
    10    23236.24   22.47    2.090  0.30( 0.30) 0.99    6774.2   40200.00
    11    23659.84   24.32    1.977  0.30( 0.30) 0.99    7463.5   31810.00
    12    26614.24   36.55    1.565  0.30( 0.30) 0.99   11977.1   40100.00
    13    28277.52   46.05    1.375  0.30( 0.30) 0.99   15288.9   11801.00
    14    30410.95   57.24    1.239  0.30( 0.30) 0.99   19868.7   11530.00
    15    31510.19   61.80    1.199  0.30( 0.30) 0.99   22186.7   11701.00
    16    32433.53   65.40    1.174  0.30( 0.30) 0.99   24255.7   11910.00
    17    35200.23   76.02    1.102  0.30( 0.30) 0.99   30975.2   10800.00
```

18	35933.51	80.36	1.073	0.30(0.30)	0.99	33917.9	11130.00
19	36052.55	89.95	1.007	0.30(0.30)	0.99	38956.6	12410.00
20	35961.82	92.83	0.995	0.30(0.30)	0.99	40338.1	10600.00
21	35840.89	98.19	0.972	0.30(0.30)	0.99	42698.8	11201.00
22	35593.65	103.10	0.950	0.30(0.30)	0.99	44428.5	12201.00
23	35321.38	105.83	0.938	0.30(0.30)	0.99	45219.0	10410.00
24	34777.65	109.99	0.920	0.30(0.30)	0.99	46283.8	12231.00
25	34404.16	112.84	0.908	0.30(0.30)	0.99	46960.1	12101.10
26	33674.40	117.59	0.887	0.30(0.30)	0.99	47920.2	10400.00
27	32508.35	125.30	0.866	0.30(0.30)	0.99	49214.8	12010.00
28	31470.56	131.06	0.855	0.30(0.30)	0.99	49563.5	10210.00
29	31031.10	133.96	0.849	0.30(0.30)	0.99	49679.0	12000.00
30	27952.80	158.42	0.800	0.30(0.30)	0.99	50301.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	178.01	13.93	2.866	0.30(0.30)	1.00	77.1	40510.00
2	172.23	15.40	2.651	0.30(0.30)	1.00	81.4	40500.00

LONGEST FLOWPATH FROM NODE 40500.00 TO NODE 12605.60 = 4091.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20661.08	13.93	2.866	0.30(0.30)	0.99	4202.1	40510.00
2	20933.76	15.40	2.651	0.30(0.30)	0.99	4643.4	40500.00
3	22199.53	18.63	2.364	0.30(0.30)	0.99	5600.5	40430.00
4	22251.55	18.82	2.347	0.30(0.30)	0.99	5656.1	31700.00
5	22366.84	19.19	2.314	0.30(0.30)	0.99	5775.5	40440.00
6	22720.54	20.34	2.221	0.30(0.30)	0.99	6143.4	40400.00
7	22773.39	20.51	2.211	0.30(0.30)	0.99	6198.6	40420.00
8	22791.61	20.57	2.207	0.30(0.30)	0.99	6217.7	40410.00
9	22888.36	20.89	2.187	0.30(0.30)	0.99	6319.2	31800.00
10	22966.02	21.14	2.172	0.30(0.30)	0.99	6404.3	40300.00
11	23313.74	22.29	2.101	0.30(0.30)	0.99	6795.8	31710.00
12	23367.38	22.47	2.090	0.30(0.30)	0.99	6855.6	40200.00
13	23782.67	24.32	1.977	0.30(0.30)	0.99	7544.8	31810.00
14	26706.96	36.55	1.565	0.30(0.30)	0.99	12058.5	40100.00
15	28356.28	46.05	1.375	0.30(0.30)	0.99	15370.3	11801.00
16	30479.73	57.24	1.239	0.30(0.30)	0.99	19950.1	11530.00
17	31576.05	61.80	1.199	0.30(0.30)	0.99	22268.0	11701.00
18	32497.60	65.40	1.174	0.30(0.30)	0.99	24337.0	11910.00
19	35259.01	76.02	1.102	0.30(0.30)	0.99	31056.5	10800.00
20	35990.13	80.36	1.073	0.30(0.30)	0.99	33999.3	11130.00
21	36104.39	89.95	1.007	0.30(0.30)	0.99	39038.0	12410.00
22	36012.75	92.83	0.995	0.30(0.30)	0.99	40419.4	10600.00
23	35890.12	98.19	0.972	0.30(0.30)	0.99	42780.1	11201.00
24	35641.32	103.10	0.950	0.30(0.30)	0.99	44509.8	12201.00
25	35368.18	105.83	0.938	0.30(0.30)	0.99	45300.3	10410.00
26	34823.12	109.99	0.920	0.30(0.30)	0.99	46365.2	12231.00
27	34448.73	112.84	0.908	0.30(0.30)	0.99	47041.5	12101.10
28	33717.47	117.59	0.887	0.30(0.30)	0.99	48001.6	10400.00
29	32549.87	125.30	0.866	0.30(0.30)	0.99	49296.2	12010.00
30	31511.25	131.06	0.855	0.30(0.30)	0.99	49644.8	10210.00
31	31071.36	133.96	0.849	0.30(0.30)	0.99	49760.3	12000.00
32	27989.48	158.42	0.800	0.30(0.30)	0.99	50383.1	10100.00

TOTAL AREA(ACRES) = 50383.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 36104.39 Tc(MIN.) = 89.947
EFFECTIVE AREA(ACRES) = 39038.02 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50383.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

****
FLOW PROCESS FROM NODE 12605.60 TO NODE 12606.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 295.00 DOWNSTREAM(FEET) = 286.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1203.43 CHANNEL SLOPE = 0.0075
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.96
CHANNEL FLOW THRU SUBAREA(CFS) = 36104.39
FLOW VELOCITY(FEET/SEC.) = 16.46 FLOW DEPTH(FEET) = 8.96
TRAVEL TIME(MIN.) = 1.22 Tc(MIN.) = 91.17
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

****
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610406X.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	232.91	20.42	0.30(0.30)	0.99	135.0	40600.00

TOTAL AREA(ACRES) = 135.0

****
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20661.08	15.40	2.652	0.30(0.30)	0.99	4202.1	40510.00
2	20933.76	16.86	2.521	0.30(0.30)	0.99	4643.4	40500.00
3	22199.53	20.07	2.238	0.30(0.30)	0.99	5600.5	40430.00
4	22251.55	20.25	2.227	0.30(0.30)	0.99	5656.1	31700.00
5	22366.84	20.62	2.204	0.30(0.30)	0.99	5775.5	40440.00
6	22720.54	21.76	2.134	0.30(0.30)	0.99	6143.4	40400.00
7	22773.39	21.93	2.123	0.30(0.30)	0.99	6198.6	40420.00

8	22791.61	21.99	2.120	0.30(0.30)	0.99	6217.7	40410.00
9	22888.36	22.31	2.100	0.30(0.30)	0.99	6319.2	31800.00
10	22966.02	22.56	2.085	0.30(0.30)	0.99	6404.3	40300.00
11	23313.74	23.70	2.015	0.30(0.30)	0.99	6795.8	31710.00
12	23367.38	23.88	2.004	0.30(0.30)	0.99	6855.6	40200.00
13	23782.67	25.72	1.907	0.30(0.30)	0.99	7544.8	31810.00
14	26706.96	37.90	1.529	0.30(0.30)	0.99	12058.5	40100.00
15	28356.28	47.37	1.354	0.30(0.30)	0.99	15370.3	11801.00
16	30479.73	58.53	1.226	0.30(0.30)	0.99	19950.1	11530.00
17	31576.05	63.07	1.190	0.30(0.30)	0.99	22268.0	11701.00
18	32497.60	66.66	1.166	0.30(0.30)	0.99	24337.0	11910.00
19	35259.01	77.24	1.094	0.30(0.30)	0.99	31056.5	10800.00
20	35990.13	81.58	1.064	0.30(0.30)	0.99	33999.3	11130.00
21	36104.39	91.17	1.002	0.30(0.30)	0.99	39038.0	12410.00
22	36012.75	94.05	0.989	0.30(0.30)	0.99	40419.4	10600.00
23	35890.12	99.41	0.966	0.30(0.30)	0.99	42780.1	11201.00
24	35641.32	104.32	0.945	0.30(0.30)	0.99	44509.8	12201.00
25	35368.18	107.05	0.933	0.30(0.30)	0.99	45300.3	10410.00
26	34823.12	111.23	0.915	0.30(0.30)	0.99	46365.2	12231.00
27	34448.73	114.07	0.903	0.30(0.30)	0.99	47041.5	12101.10
28	33717.47	118.84	0.882	0.30(0.30)	0.99	48001.6	10400.00
29	32549.87	126.56	0.864	0.30(0.30)	0.99	49296.2	12010.00
30	31511.25	132.33	0.852	0.30(0.30)	0.99	49644.8	10210.00
31	31071.36	135.25	0.847	0.30(0.30)	0.99	49760.3	12000.00
32	27989.48	159.75	0.798	0.30(0.30)	0.99	50383.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	232.91	20.42	2.216	0.30(0.30)	0.99	135.0	40600.00

LONGEST FLOWPATH FROM NODE 40600.00 TO NODE 12606.00 = 6107.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20876.57	15.40	2.652	0.30(0.30)	0.99	4303.9	40510.00
2	21156.69	16.86	2.521	0.30(0.30)	0.99	4754.9	40500.00
3	22431.00	20.07	2.238	0.30(0.30)	0.99	5733.2	40430.00
4	22483.79	20.25	2.227	0.30(0.30)	0.99	5789.9	31700.00
5	22536.65	20.42	2.216	0.30(0.30)	0.99	5845.1	40600.00
6	22598.25	20.62	2.204	0.30(0.30)	0.99	5910.5	40440.00
7	22943.46	21.76	2.134	0.30(0.30)	0.99	6278.3	40400.00
8	22995.03	21.93	2.123	0.30(0.30)	0.99	6333.5	40420.00
9	23012.80	21.99	2.120	0.30(0.30)	0.99	6352.6	40410.00
10	23107.16	22.31	2.100	0.30(0.30)	0.99	6454.2	31800.00
11	23183.00	22.56	2.085	0.30(0.30)	0.99	6539.3	40300.00
12	23522.16	23.70	2.015	0.30(0.30)	0.99	6930.8	31710.00
13	23574.47	23.88	2.004	0.30(0.30)	0.99	6990.6	40200.00
14	23978.02	25.72	1.907	0.30(0.30)	0.99	7679.8	31810.00
15	26856.44	37.90	1.529	0.30(0.30)	0.99	12193.5	40100.00
16	28484.43	47.37	1.354	0.30(0.30)	0.99	15505.3	11801.00
17	30592.35	58.53	1.226	0.30(0.30)	0.99	20085.1	11530.00
18	31684.34	63.07	1.190	0.30(0.30)	0.99	22403.0	11701.00
19	32602.93	66.66	1.166	0.30(0.30)	0.99	24472.0	11910.00
20	35355.60	77.24	1.094	0.30(0.30)	0.99	31191.5	10800.00
21	36083.14	81.58	1.064	0.30(0.30)	0.99	34134.2	11130.00
22	36189.84	91.17	1.002	0.30(0.30)	0.99	39173.0	12410.00

23	36096.68	94.05	0.989	0.30(0.30)	0.99	40554.4	10600.00
24	35971.22	99.41	0.966	0.30(0.30)	0.99	42915.1	11201.00
25	35719.84	104.32	0.945	0.30(0.30)	0.99	44644.8	12201.00
26	35445.26	107.05	0.933	0.30(0.30)	0.99	45435.3	10410.00
27	34898.01	111.23	0.915	0.30(0.30)	0.99	46500.2	12231.00
28	34522.12	114.07	0.903	0.30(0.30)	0.99	47176.4	12101.10
29	33788.35	118.84	0.882	0.30(0.30)	0.99	48136.6	10400.00
30	32618.55	126.56	0.864	0.30(0.30)	0.99	49431.1	12010.00
31	31578.52	132.33	0.852	0.30(0.30)	0.99	49779.8	10210.00
32	31137.92	135.25	0.847	0.30(0.30)	0.99	49895.3	12000.00
33	28050.09	159.75	0.798	0.30(0.30)	0.99	50518.0	10100.00

TOTAL AREA(ACRES) = 50518.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 36189.84 Tc(MIN.) = 91.166
EFFECTIVE AREA(ACRES) = 39172.99 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50518.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 50518.0 TC(MIN.) = 91.17
EFFECTIVE AREA(ACRES) = 39172.99 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994
PEAK FLOW RATE(CFS) = 36189.84

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20876.57	15.40	2.652	0.30(0.30)	0.99	4303.9	40510.00
2	21156.69	16.86	2.521	0.30(0.30)	0.99	4754.9	40500.00
3	22431.00	20.07	2.238	0.30(0.30)	0.99	5733.2	40430.00
4	22483.79	20.25	2.227	0.30(0.30)	0.99	5789.9	31700.00
5	22536.65	20.42	2.216	0.30(0.30)	0.99	5845.1	40600.00
6	22598.25	20.62	2.204	0.30(0.30)	0.99	5910.5	40440.00
7	22943.46	21.76	2.134	0.30(0.30)	0.99	6278.3	40400.00
8	22995.03	21.93	2.123	0.30(0.30)	0.99	6333.5	40420.00
9	23012.80	21.99	2.120	0.30(0.30)	0.99	6352.6	40410.00
10	23107.16	22.31	2.100	0.30(0.30)	0.99	6454.2	31800.00
11	23183.00	22.56	2.085	0.30(0.30)	0.99	6539.3	40300.00
12	23522.16	23.70	2.015	0.30(0.30)	0.99	6930.8	31710.00
13	23574.47	23.88	2.004	0.30(0.30)	0.99	6990.6	40200.00
14	23978.02	25.72	1.907	0.30(0.30)	0.99	7679.8	31810.00
15	26856.44	37.90	1.529	0.30(0.30)	0.99	12193.5	40100.00
16	28484.43	47.37	1.354	0.30(0.30)	0.99	15505.3	11801.00
17	30592.35	58.53	1.226	0.30(0.30)	0.99	20085.1	11530.00
18	31684.34	63.07	1.190	0.30(0.30)	0.99	22403.0	11701.00
19	32602.93	66.66	1.166	0.30(0.30)	0.99	24472.0	11910.00
20	35355.60	77.24	1.094	0.30(0.30)	0.99	31191.5	10800.00
21	36083.14	81.58	1.064	0.30(0.30)	0.99	34134.2	11130.00
22	36189.84	91.17	1.002	0.30(0.30)	0.99	39173.0	12410.00
23	36096.68	94.05	0.989	0.30(0.30)	0.99	40554.4	10600.00
24	35971.22	99.41	0.966	0.30(0.30)	0.99	42915.1	11201.00
25	35719.84	104.32	0.945	0.30(0.30)	0.99	44644.8	12201.00
26	35445.26	107.05	0.933	0.30(0.30)	0.99	45435.3	10410.00
27	34898.01	111.23	0.915	0.30(0.30)	0.99	46500.2	12231.00
28	34522.12	114.07	0.903	0.30(0.30)	0.99	47176.4	12101.10
29	33788.35	118.84	0.882	0.30(0.30)	0.99	48136.6	10400.00

30	32618.55	126.56	0.864	0.30(0.30)	0.99	49431.1	12010.00
31	31578.52	132.33	0.852	0.30(0.30)	0.99	49779.8	10210.00
32	31137.92	135.25	0.847	0.30(0.30)	0.99	49895.3	12000.00
33	28050.09	159.75	0.798	0.30(0.30)	0.99	50518.0	10100.00

END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S27.DAT
  TIME/DATE OF STUDY: 09:45 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.460
   2)   10.00;  3.494
   3)   15.00;  2.672
   4)   20.00;  2.231
   5)   25.00;  1.927
   6)   30.00;  1.734
   7)   40.00;  1.467
   8)   50.00;  1.306
   9)   60.00;  1.203
  10)   90.00;  1.000
  11)  120.00;  0.870
  12)  180.00;  0.748
  13)  360.00;  0.556
  14) 1200.00;  0.244
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



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**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S26.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    21156.69   16.86  0.30( 0.30) 0.99    4754.9   40500.00
      2    22598.25   20.62  0.30( 0.30) 0.99    5910.5   40440.00
      3    23978.02   25.72  0.30( 0.30) 0.99    7679.8   31810.00
      4    26856.44   37.90  0.30( 0.30) 0.99   12193.5   40100.00
      5    28484.43   47.37  0.30( 0.30) 0.99   15505.3   11801.00
      6    30592.35   58.53  0.30( 0.30) 0.99   20085.1   11530.00
      7    31684.34   63.07  0.30( 0.30) 0.99   22403.0   11701.00
      8    32602.93   66.66  0.30( 0.30) 0.99   24472.0   11910.00
      9    35355.60   77.24  0.30( 0.30) 0.99   31191.5   10800.00
     10    36083.14   81.58  0.30( 0.30) 0.99   34134.2   11130.00
     11    36189.84   91.17  0.30( 0.30) 0.99   39173.0   12410.00
     12    35971.22   99.41  0.30( 0.30) 0.99   42915.1   11201.00
     13    35719.84  104.32  0.30( 0.30) 0.99   44644.8   12201.00
     14    34898.01  111.23  0.30( 0.30) 0.99   46500.2   12231.00
     15    34522.12  114.07  0.30( 0.30) 0.99   47176.4   12101.10
     16    33788.35  118.84  0.30( 0.30) 0.99   48136.6   10400.00
     17    32618.55  126.56  0.30( 0.30) 0.99   49431.1   12010.00
     18    31578.52  132.33  0.30( 0.30) 0.99   49779.8   10210.00
     19    31137.92  135.25  0.30( 0.30) 0.99   49895.3   12000.00
     20    28050.09  159.75  0.30( 0.30) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =    50518.0

**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    21156.69   16.86  0.30( 0.30) 0.99    4754.9   40500.00
      2    22598.25   20.62  0.30( 0.30) 0.99    5910.5   40440.00
      3    23978.02   25.72  0.30( 0.30) 0.99    7679.8   31810.00
      4    26856.44   37.90  0.30( 0.30) 0.99   12193.5   40100.00
      5    28484.43   47.37  0.30( 0.30) 0.99   15505.3   11801.00
      6    30592.35   58.53  0.30( 0.30) 0.99   20085.1   11530.00
      7    31684.34   63.07  0.30( 0.30) 0.99   22403.0   11701.00
      8    32602.93   66.66  0.30( 0.30) 0.99   24472.0   11910.00
      9    35355.60   77.24  0.30( 0.30) 0.99   31191.5   10800.00
     10    36083.14   81.58  0.30( 0.30) 0.99   34134.2   11130.00
     11    36189.84   91.17  0.30( 0.30) 0.99   39173.0   12410.00
     12    35971.22   99.41  0.30( 0.30) 0.99   42915.1   11201.00
     13    35719.84  104.32  0.30( 0.30) 0.99   44644.8   12201.00
     14    34898.01  111.23  0.30( 0.30) 0.99   46500.2   12231.00
     15    34522.12  114.07  0.30( 0.30) 0.99   47176.4   12101.10
     16    33788.35  118.84  0.30( 0.30) 0.99   48136.6   10400.00
     17    32618.55  126.56  0.30( 0.30) 0.99   49431.1   12010.00
     18    31578.52  132.33  0.30( 0.30) 0.99   49779.8   10210.00
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     19    31137.92  135.25  0.30( 0.30) 0.99   49895.3   12000.00
     20    28050.09  159.75  0.30( 0.30) 0.99   50518.0   10100.00
    TOTAL AREA(ACRES) =     50518.0

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12701.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    286.00  DOWNSTREAM(FEET) =    276.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.19   CHANNEL SLOPE =  0.0079
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.82
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.990
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.55      0.30     0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   36192.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.80
  AVERAGE FLOW DEPTH(FEET) =   8.82   TRAVEL TIME(MIN.) =   1.25
  Tc(MIN.) =   92.42
  SUBAREA AREA(ACRES) =     7.55       SUBAREA RUNOFF(CFS) =    4.91
  EFFECTIVE AREA(ACRES) =  39180.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50525.6         PEAK FLOW RATE(CFS) =   36189.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.82   FLOW VELOCITY(FEET/SEC.) =  16.80
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12701.00 =  105865.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    276.00  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   147.65   CHANNEL SLOPE =  0.0068
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.23
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.989
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        1.49      0.30     0.972     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.972
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   36190.30
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  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.93
  AVERAGE FLOW DEPTH(FEET) =   9.23   TRAVEL TIME(MIN.) =   0.15
  Tc(MIN.) =   92.57
  SUBAREA AREA(ACRES) =     1.49       SUBAREA RUNOFF(CFS) =    0.94
  EFFECTIVE AREA(ACRES) =  39182.03     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50527.1         PEAK FLOW RATE(CFS) =   36189.84
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.23   FLOW VELOCITY(FEET/SEC.) =  15.93
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   92.57
  RAINFALL INTENSITY(INCH/HR) =   0.99
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =   39182.03
  TOTAL STREAM AREA(ACRES) =   50527.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   36189.84

****************************************************************************
  FLOW PROCESS FROM NODE  12710.00 TO NODE  12711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.56
  ELEVATION DATA: UPSTREAM(FEET) =    940.78  DOWNSTREAM(FEET) =    657.79

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.910
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.851
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.56      0.30     1.000     0   13.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     15.06
  TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =     15.06

****************************************************************************
  FLOW PROCESS FROM NODE  12711.00 TO NODE  12712.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    657.79  DOWNSTREAM(FEET) =    585.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =   766.00   CHANNEL SLOPE =  0.0942
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.72
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.560
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       26.94      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.53
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.40
 AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   2.36
 Tc(MIN.) =   16.27
 SUBAREA AREA(ACRES) =    26.94       SUBAREA RUNOFF(CFS) =   54.79
 EFFECTIVE AREA(ACRES) =     33.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       33.5         PEAK FLOW RATE(CFS) =      68.14
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   6.33
 LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12712.00 =    1709.56 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12712.00 TO NODE  12713.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    585.63  DOWNSTREAM(FEET) =    463.75
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.79   CHANNEL SLOPE =  0.1188
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.95
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.353
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       14.73      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.75
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.29
 AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   2.34
 Tc(MIN.) =   18.62
 SUBAREA AREA(ACRES) =    14.73       SUBAREA RUNOFF(CFS) =   27.22
 EFFECTIVE AREA(ACRES) =     48.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       48.2         PEAK FLOW RATE(CFS) =      89.12
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



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 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =   7.52
 LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12713.00 =    2735.35 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12713.00 TO NODE  12714.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    463.75  DOWNSTREAM(FEET) =    360.30
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1148.54   CHANNEL SLOPE =  0.0901
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.178
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      105.64      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     178.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.51
 AVERAGE FLOW DEPTH(FEET) =   1.59   TRAVEL TIME(MIN.) =   2.25
 Tc(MIN.) =   20.87
 SUBAREA AREA(ACRES) =   105.64       SUBAREA RUNOFF(CFS) =  178.59
 EFFECTIVE AREA(ACRES) =    153.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      153.9         PEAK FLOW RATE(CFS) =     260.13
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.96

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =   9.55
 LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12714.00 =    3883.89 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    360.30  DOWNSTREAM(FEET) =    275.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1314.99   CHANNEL SLOPE =  0.0649
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.58
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.036
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      127.13      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 359.47
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.33
AVERAGE FLOW DEPTH(FEET) = 2.55 TRAVEL TIME(MIN.) = 2.35
Tc(MIN.) = 23.22
SUBAREA AREA(ACRES) = 127.13 SUBAREA RUNOFF(CFS) = 198.58
EFFECTIVE AREA(ACRES) = 281.00 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 281.0 PEAK FLOW RATE(CFS) = 438.93
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.84 FLOW VELOCITY(FEET/SEC.) = 9.88
LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12720.00 = 5198.88 FEET.

****
FLOW PROCESS FROM NODE 12714.00 TO NODE 12720.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 23.22
RAINFALL INTENSITY(INCH/HR) = 2.04
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 281.00
TOTAL STREAM AREA(ACRES) = 281.00
PEAK FLOW RATE(CFS) AT CONFLUENCE = 438.93

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21156.69	18.55	2.359	0.30(0.30)	0.99	4763.9	40500.00
1	22598.25	22.27	2.093	0.30(0.30)	0.99	5919.5	40440.00
1	23978.02	27.33	1.837	0.30(0.30)	0.99	7688.8	31810.00
1	26856.44	39.45	1.482	0.30(0.30)	0.99	12202.5	40100.00
1	28484.43	48.89	1.324	0.30(0.30)	0.99	15514.3	11801.00
1	30592.35	60.01	1.203	0.30(0.30)	0.99	20094.1	11530.00
1	31684.34	64.54	1.172	0.30(0.30)	0.99	22412.1	11701.00
1	32602.93	68.11	1.148	0.30(0.30)	0.99	24481.1	11910.00
1	35355.60	78.66	1.077	0.30(0.30)	0.99	31200.6	10800.00
1	36083.14	82.98	1.047	0.30(0.30)	0.99	34143.3	11130.00
1	36189.84	92.57	0.989	0.30(0.30)	0.99	39182.0	12410.00
1	35971.22	100.81	0.953	0.30(0.30)	0.99	42924.1	11201.00
1	35719.84	105.73	0.932	0.30(0.30)	0.99	44653.9	12201.00
1	34898.01	112.65	0.902	0.30(0.30)	0.99	46509.2	12231.00
1	34522.12	115.50	0.889	0.30(0.30)	0.99	47185.5	12101.10
1	33788.35	120.28	0.869	0.30(0.30)	0.99	48145.6	10400.00
1	32618.55	128.01	0.854	0.30(0.30)	0.99	49440.2	12010.00
1	31578.52	133.80	0.842	0.30(0.30)	0.99	49788.9	10210.00
1	31137.92	136.72	0.836	0.30(0.30)	0.99	49904.3	12000.00
1	28050.09	161.28	0.786	0.30(0.30)	0.99	50527.1	10100.00
2	438.93	23.22	2.036	0.30(0.30)	1.00	281.0	12710.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21572.74	18.55	2.359	0.30(0.30)	0.99	4988.4	40500.00
2	23033.22	22.27	2.093	0.30(0.30)	0.99	6189.0	40440.00
3	23295.73	23.22	2.036	0.30(0.30)	0.99	6532.1	12710.00
4	24366.73	27.33	1.837	0.30(0.30)	0.99	7969.8	31810.00
5	27155.29	39.45	1.482	0.30(0.30)	0.99	12483.5	40100.00
6	28743.36	48.89	1.324	0.30(0.30)	0.99	15795.3	11801.00
7	30820.72	60.01	1.203	0.30(0.30)	0.99	20375.1	11530.00
8	31904.96	64.54	1.172	0.30(0.30)	0.99	22693.1	11701.00
9	32817.44	68.11	1.148	0.30(0.30)	0.99	24762.1	11910.00
10	35552.05	78.66	1.077	0.30(0.30)	0.99	31481.6	10800.00
11	36272.20	82.98	1.047	0.30(0.30)	0.99	34424.3	11130.00
12	36364.07	92.57	0.989	0.30(0.30)	0.99	39463.0	12410.00
13	36136.42	100.81	0.953	0.30(0.30)	0.99	43205.1	11201.00
14	35879.64	105.73	0.932	0.30(0.30)	0.99	44934.9	12201.00
15	35050.24	112.65	0.902	0.30(0.30)	0.99	46790.2	12231.00
16	34671.22	115.50	0.889	0.30(0.30)	0.99	47466.5	12101.10
17	33932.38	120.28	0.869	0.30(0.30)	0.99	48426.6	10400.00
18	32758.60	128.01	0.854	0.30(0.30)	0.99	49721.2	12010.00
19	31715.59	133.80	0.842	0.30(0.30)	0.99	50069.9	10210.00
20	31273.49	136.72	0.836	0.30(0.30)	0.99	50185.3	12000.00
21	28173.04	161.28	0.786	0.30(0.30)	0.99	50808.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 36364.07 Tc(MIN.) = 92.57
EFFECTIVE AREA(ACRES) = 39463.03 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50808.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==
MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: 0610316X.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	336.57	25.48	0.30(0.30)	0.98	231.4	31600.00

TOTAL AREA(ACRES) = 231.4

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

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================================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    21572.74   18.55    2.359  0.30( 0.30) 0.99    4988.4   40500.00
     2    23033.22   22.27    2.093  0.30( 0.30) 0.99    6189.0   40440.00
     3    23295.73   23.22    2.036  0.30( 0.30) 0.99    6532.1   12710.00
     4    24366.73   27.33    1.837  0.30( 0.30) 0.99    7969.8   31810.00
     5    27155.29   39.45    1.482  0.30( 0.30) 0.99   12483.5   40100.00
     6    28743.36   48.89    1.324  0.30( 0.30) 0.99   15795.3   11801.00
     7    30820.72   60.01    1.203  0.30( 0.30) 0.99   20375.1   11530.00
     8    31904.96   64.54    1.172  0.30( 0.30) 0.99   22693.1   11701.00
     9    32817.44   68.11    1.148  0.30( 0.30) 0.99   24762.1   11910.00
    10    35552.05   78.66    1.077  0.30( 0.30) 0.99   31481.6   10800.00
    11    36272.20   82.98    1.047  0.30( 0.30) 0.99   34424.3   11130.00
    12    36364.07   92.57    0.989  0.30( 0.30) 0.99   39463.0   12410.00
    13    36136.42  100.81    0.953  0.30( 0.30) 0.99   43205.1   11201.00
    14    35879.64  105.73    0.932  0.30( 0.30) 0.99   44934.9   12201.00
    15    35050.24  112.65    0.902  0.30( 0.30) 0.99   46790.2   12231.00
    16    34671.22  115.50    0.889  0.30( 0.30) 0.99   47466.5   12101.10
    17    33932.38  120.28    0.869  0.30( 0.30) 0.99   48426.6   10400.00
    18    32758.60  128.01    0.854  0.30( 0.30) 0.99   49721.2   12010.00
    19    31715.59  133.80    0.842  0.30( 0.30) 0.99   50069.9   10210.00
    20    31273.49  136.72    0.836  0.30( 0.30) 0.99   50185.3   12000.00
    21    28173.04  161.28    0.786  0.30( 0.30) 0.99   50808.1   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      336.57   25.48    1.908  0.30( 0.30) 0.98     231.4   31600.00
 LONGEST FLOWPATH FROM NODE  31600.00 TO NODE  12720.00 =    7759.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    21886.15   18.55    2.359  0.30( 0.30) 0.99    5156.8   40500.00
     2    23361.00   22.27    2.093  0.30( 0.30) 0.99    6391.2   40440.00
     3    23626.51   23.22    2.036  0.30( 0.30) 0.99    6742.9   12710.00
     4    24221.80   25.48    1.908  0.30( 0.30) 0.99    7554.9   31600.00
     5    24688.38   27.33    1.837  0.30( 0.30) 0.99    8201.2   31810.00
     6    27402.83   39.45    1.482  0.30( 0.30) 0.99   12714.9   40100.00
     7    28957.97   48.89    1.324  0.30( 0.30) 0.99   16026.7   11801.00
     8    31010.10   60.01    1.203  0.30( 0.30) 0.99   20606.5   11530.00
     9    32087.95   64.54    1.172  0.30( 0.30) 0.99   22924.5   11701.00
    10    32995.39   68.11    1.148  0.30( 0.30) 0.99   24993.4   11910.00
    11    35715.11   78.66    1.077  0.30( 0.30) 0.99   31712.9   10800.00
    12    36429.16   82.98    1.047  0.30( 0.30) 0.99   34655.7   11130.00
    13    36508.79   92.57    0.989  0.30( 0.30) 0.99   39694.4   12410.00
    14    36273.69  100.81    0.953  0.30( 0.30) 0.99   43436.5   11201.00
    15    36012.47  105.73    0.932  0.30( 0.30) 0.99   45166.3   12201.00
    16    35176.81  112.65    0.902  0.30( 0.30) 0.99   47021.6   12231.00
    17    34795.21  115.50    0.889  0.30( 0.30) 0.99   47697.9   12101.10
    18    34052.18  120.28    0.869  0.30( 0.30) 0.99   48658.0   10400.00
    19    32875.12  128.01    0.854  0.30( 0.30) 0.99   49952.6   12010.00
    20    31829.66  133.80    0.842  0.30( 0.30) 0.99   50301.2   10210.00
    21    31386.33  136.72    0.836  0.30( 0.30) 0.99   50416.7   12000.00
```



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    22    28275.45  161.28    0.786  0.30( 0.30) 0.99   51039.5   10100.00
   TOTAL AREA(ACRES) =     51039.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    36508.79  Tc(MIN.) =   92.570
  EFFECTIVE AREA(ACRES) =  39694.43  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51039.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    275.00  DOWNSTREAM(FEET) =    258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2669.21   CHANNEL SLOPE =  0.0064
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.44
  CHANNEL FLOW THRU SUBAREA(CFS) =   36508.79
  FLOW VELOCITY(FEET/SEC.) =  15.64   FLOW DEPTH(FEET) =   9.44
  TRAVEL TIME(MIN.) =   2.84   Tc(MIN.) =   95.41
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610315X.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      106.97   23.96  0.30( 0.25) 0.83      68.1   31500.00
    TOTAL AREA(ACRES) =       68.1

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    21886.15   21.92    2.115  0.30( 0.30) 0.99    5156.8   40500.00
      2    23361.00   25.56    1.905  0.30( 0.30) 0.99    6391.2   40440.00
      3    23626.51   26.50    1.869  0.30( 0.30) 0.99    6742.9   12710.00
      4    24221.80   28.74    1.783  0.30( 0.30) 0.99    7554.9   31600.00
      5    24688.38   30.57    1.719  0.30( 0.30) 0.99    8201.2   31810.00
```

```
     6    27402.83   42.58    1.426  0.30( 0.30) 0.99   12714.9   40100.00
     7    28957.97   51.96    1.286  0.30( 0.30) 0.99   16026.7   11801.00
     8    31010.10   63.01    1.183  0.30( 0.30) 0.99   20606.5   11530.00
     9    32087.95   67.50    1.152  0.30( 0.30) 0.99   22924.5   11701.00
    10    32995.39   71.05    1.128  0.30( 0.30) 0.99   24993.4   11910.00
    11    35715.11   81.52    1.057  0.30( 0.30) 0.99   31712.9   10800.00
    12    36429.16   85.83    1.028  0.30( 0.30) 0.99   34655.7   11130.00
    13    36508.79   95.41    0.977  0.30( 0.30) 0.99   39694.4   12410.00
    14    36273.69  103.66    0.941  0.30( 0.30) 0.99   43436.5   11201.00
    15    36012.47  108.59    0.919  0.30( 0.30) 0.99   45166.3   12201.00
    16    35176.81  115.53    0.889  0.30( 0.30) 0.99   47021.6   12231.00
    17    34795.21  118.39    0.877  0.30( 0.30) 0.99   47697.9   12101.10
    18    34052.18  123.19    0.864  0.30( 0.30) 0.99   48658.0   10400.00
    19    32875.12  130.96    0.848  0.30( 0.30) 0.99   49952.6   12010.00
    20    31829.66  136.78    0.836  0.30( 0.30) 0.99   50301.2   10210.00
    21    31386.33  139.71    0.830  0.30( 0.30) 0.99   50416.7   12000.00
    22    28275.45  164.37    0.780  0.30( 0.30) 0.99   51039.5   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      106.97   23.96    1.990  0.30( 0.25) 0.83      68.1   31500.00
LONGEST FLOWPATH FROM NODE  31500.00 TO NODE  12720.50 =    4043.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    21990.97   21.92    2.115  0.30( 0.30) 0.99    5219.1   40500.00
    2    22820.50   23.96    1.990  0.30( 0.30) 0.99    5917.4   31500.00
    3    23462.76   25.56    1.905  0.30( 0.30) 0.99    6459.3   40440.00
    4    23726.05   26.50    1.869  0.30( 0.30) 0.99    6811.0   12710.00
    5    24316.04   28.74    1.783  0.30( 0.30) 0.99    7623.0   31600.00
    6    24778.69   30.57    1.719  0.30( 0.30) 0.99    8269.3   31810.00
    7    27475.13   42.58    1.426  0.30( 0.30) 0.99   12783.0   40100.00
    8    29021.70   51.96    1.286  0.30( 0.30) 0.99   16094.8   11801.00
    9    31067.50   63.01    1.183  0.30( 0.30) 0.99   20674.6   11530.00
   10    32143.48   67.50    1.152  0.30( 0.30) 0.99   22992.6   11701.00
   11    33049.44   71.05    1.128  0.30( 0.30) 0.99   25061.5   11910.00
   12    35764.82   81.52    1.057  0.30( 0.30) 0.99   31781.0   10800.00
   13    36477.07   85.83    1.028  0.30( 0.30) 0.99   34723.8   11130.00
   14    36553.53   95.41    0.977  0.30( 0.30) 0.99   39762.5   12410.00
   15    36316.23  103.66    0.941  0.30( 0.30) 0.99   43504.6   11201.00
   16    36053.70  108.59    0.919  0.30( 0.30) 0.99   45234.4   12201.00
   17    35216.20  115.53    0.889  0.30( 0.30) 0.99   47089.7   12231.00
   18    34833.84  118.39    0.877  0.30( 0.30) 0.99   47766.0   12101.10
   19    34089.98  123.19    0.864  0.30( 0.30) 0.99   48726.1   10400.00
   20    32911.96  130.96    0.848  0.30( 0.30) 0.99   50020.7   12010.00
   21    31865.77  136.78    0.836  0.30( 0.30) 0.99   50369.3   10210.00
   22    31422.06  139.71    0.830  0.30( 0.30) 0.99   50484.8   12000.00
   23    28308.11  164.37    0.780  0.30( 0.30) 0.99   51107.6   10100.00
  TOTAL AREA(ACRES) =     51107.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    36553.53  Tc(MIN.) =   95.414
EFFECTIVE AREA(ACRES) =  39762.52  AREA-AVERAGED Fm(INCH/HR) =  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
TOTAL AREA(ACRES) =    51107.6
```



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  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    256.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   438.77   CHANNEL SLOPE =  0.0046
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.38
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.974
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.15      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   36572.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.99
  AVERAGE FLOW DEPTH(FEET) =  10.38   TRAVEL TIME(MIN.) =   0.52
  Tc(MIN.) =   95.94
  SUBAREA AREA(ACRES) =    62.15       SUBAREA RUNOFF(CFS) =   37.72
  EFFECTIVE AREA(ACRES) =  39824.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    51169.7          PEAK FLOW RATE(CFS) =   36553.53
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.38   FLOW VELOCITY(FEET/SEC.) =  13.98
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12721.00 =  109120.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12721.00 TO NODE  12722.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    256.00  DOWNSTREAM(FEET) =    255.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.42   CHANNEL SLOPE =  0.0012
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.01
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.968
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   36556.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.85
  AVERAGE FLOW DEPTH(FEET) =  15.01   TRAVEL TIME(MIN.) =   1.56
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```
  Tc(MIN.) =   97.50
  SUBAREA AREA(ACRES) =    11.24       SUBAREA RUNOFF(CFS) =    6.75
  EFFECTIVE AREA(ACRES) =  39835.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    51180.9         PEAK FLOW RATE(CFS) =   36553.53
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 15.01   FLOW VELOCITY(FEET/SEC.) =   8.85
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12722.00 =  109951.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12722.00 TO NODE  12722.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610314X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.)   (INCH/HR)           (ACRES)     NODE
      1       566.88   36.46  0.30( 0.30) 0.99      497.2   31400.00
    TOTAL AREA(ACRES) =       497.2

****************************************************************************
  FLOW PROCESS FROM NODE  12722.00 TO NODE  12722.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1    21990.97   24.36     1.966  0.30( 0.30) 0.99     5292.5   40500.00
      2    22820.50   26.38     1.874  0.30( 0.30) 0.99     5990.8   31500.00
      3    23462.76   27.96     1.813  0.30( 0.30) 0.99     6532.7   40440.00
      4    23726.05   28.89     1.777  0.30( 0.30) 0.99     6884.4   12710.00
      5    24316.04   31.11     1.704  0.30( 0.30) 0.99     7696.3   31600.00
      6    24778.69   32.93     1.656  0.30( 0.30) 0.99     8342.7   31810.00
      7    27475.13   44.86     1.389  0.30( 0.30) 0.99    12856.4   40100.00
      8    29021.70   54.20     1.263  0.30( 0.30) 0.99    16168.2   11801.00
      9    31067.50   65.21     1.168  0.30( 0.30) 0.99    20748.0   11530.00
     10    32143.48   69.68     1.138  0.30( 0.30) 0.99    23065.9   11701.00
     11    33049.44   73.20     1.114  0.30( 0.30) 0.99    25134.9   11910.00
     12    35764.82   83.62     1.043  0.30( 0.30) 0.99    31854.4   10800.00
     13    36477.07   87.91     1.014  0.30( 0.30) 0.99    34797.2   11130.00
     14    36553.53   97.50     0.968  0.30( 0.30) 0.99    39835.9   12410.00
     15    36316.23  105.75     0.932  0.30( 0.30) 0.99    43578.0   11201.00
     16    36053.70  110.68     0.910  0.30( 0.30) 0.99    45307.7   12201.00
     17    35216.20  117.64     0.880  0.30( 0.30) 0.99    47163.1   12231.00
     18    34833.84  120.51     0.869  0.30( 0.30) 0.99    47839.4   12101.10
     19    34089.98  125.32     0.859  0.30( 0.30) 0.99    48799.5   10400.00
     20    32911.96  133.11     0.843  0.30( 0.30) 0.99    50094.0   12010.00
     21    31865.77  138.95     0.831  0.30( 0.30) 0.99    50442.7   10210.00
     22    31422.06  141.90     0.825  0.30( 0.30) 0.99    50558.2   12000.00
     23    28308.11  166.63     0.775  0.30( 0.30) 0.99    51180.9   10100.00
```



```
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12722.00 =  109951.24 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM        Q      Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1       566.88   36.46     1.561  0.30( 0.30) 0.99      497.2   31400.00
  LONGEST FLOWPATH FROM NODE  31400.00 TO NODE  12722.00 =   14614.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1    22490.85   24.36     1.966  0.30( 0.30) 0.99     5624.7   40500.00
      2    23331.94   26.38     1.874  0.30( 0.30) 0.99     6350.5   31500.00
      3    23983.86   27.96     1.813  0.30( 0.30) 0.99     6914.0   40440.00
      4    24251.72   28.89     1.777  0.30( 0.30) 0.99     7278.3   12710.00
      5    24854.38   31.11     1.704  0.30( 0.30) 0.99     8120.6   31600.00
      6    25328.83   32.93     1.656  0.30( 0.30) 0.99     8791.7   31810.00
      7    26144.45   36.46     1.561  0.30( 0.30) 0.99    10177.2   31400.00
      8    27964.62   44.86     1.389  0.30( 0.30) 0.99    13353.6   40100.00
      9    29454.64   54.20     1.263  0.30( 0.30) 0.99    16665.4   11801.00
     10    31457.88   65.21     1.168  0.30( 0.30) 0.99    21245.2   11530.00
     11    32520.30   69.68     1.138  0.30( 0.30) 0.99    23563.1   11701.00
     12    33415.56   73.20     1.114  0.30( 0.30) 0.99    25632.1   11910.00
     13    36099.33   83.62     1.043  0.30( 0.30) 0.99    32351.6   10800.00
     14    36798.57   87.91     1.014  0.30( 0.30) 0.99    35294.4   11130.00
     15    36854.13   97.50     0.968  0.30( 0.30) 0.99    40333.1   12410.00
     16    36600.80  105.75     0.932  0.30( 0.30) 0.99    44075.2   11201.00
     17    36328.69  110.68     0.910  0.30( 0.30) 0.99    45804.9   12201.00
     18    35477.68  117.64     0.880  0.30( 0.30) 0.99    47660.3   12231.00
     19    35090.27  120.51     0.869  0.30( 0.30) 0.99    48336.6   12101.10
     20    34342.02  125.32     0.859  0.30( 0.30) 0.99    49296.7   10400.00
     21    33156.89  133.11     0.843  0.30( 0.30) 0.99    50591.2   12010.00
     22    32105.38  138.95     0.831  0.30( 0.30) 0.99    50939.9   10210.00
     23    31658.99  141.90     0.825  0.30( 0.30) 0.99    51055.4   12000.00
     24    28522.49  166.63     0.775  0.30( 0.30) 0.99    51678.1   10100.00
    TOTAL AREA(ACRES) =     51678.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    36854.13  Tc(MIN.) =   97.500
  EFFECTIVE AREA(ACRES) =  40333.11  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51678.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12722.00 =  109951.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    255.00  DOWNSTREAM(FEET) =    252.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   624.00   CHANNEL SLOPE =  0.0046
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.37
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.964
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       62.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   36872.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.11
  AVERAGE FLOW DEPTH(FEET) =  10.37   TRAVEL TIME(MIN.) =   0.74
  Tc(MIN.) =   98.24
  SUBAREA AREA(ACRES) =    62.42       SUBAREA RUNOFF(CFS) =   37.32
  EFFECTIVE AREA(ACRES) =  40395.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    51740.6         PEAK FLOW RATE(CFS) =   36854.13
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.37   FLOW VELOCITY(FEET/SEC.) =  14.11
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12740.00 =  110575.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   98.24
  RAINFALL INTENSITY(INCH/HR) =   0.96
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =   40395.53
  TOTAL STREAM AREA(ACRES) =   51740.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   36854.13

****************************************************************************
  FLOW PROCESS FROM NODE  12730.00 TO NODE  12731.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   561.54
  ELEVATION DATA: UPSTREAM(FEET) =    613.29  DOWNSTREAM(FEET) =    551.75

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.823
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.866
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        6.33      0.30     1.000     0   13.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     14.62
  TOTAL AREA(ACRES) =      6.33   PEAK FLOW RATE(CFS) =     14.62
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  12731.00 TO NODE  12732.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    551.75  DOWNSTREAM(FEET) =    494.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   971.91   CHANNEL SLOPE =  0.0590
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.482
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       34.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.86
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   3.33
  Tc(MIN.) =   17.16
  SUBAREA AREA(ACRES) =    34.62       SUBAREA RUNOFF(CFS) =   67.98
  EFFECTIVE AREA(ACRES) =     40.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.9         PEAK FLOW RATE(CFS) =      80.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.14   FLOW VELOCITY(FEET/SEC.) =   5.73
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12732.00 =    1533.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12732.00 TO NODE  12733.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    494.40  DOWNSTREAM(FEET) =    431.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1156.41   CHANNEL SLOPE =  0.0548
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.224
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       59.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     132.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.53
  AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   2.95
  Tc(MIN.) =   20.11
  SUBAREA AREA(ACRES) =    59.52       SUBAREA RUNOFF(CFS) =  103.09
```

```
  EFFECTIVE AREA(ACRES) =    100.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.5         PEAK FLOW RATE(CFS) =     174.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.80   FLOW VELOCITY(FEET/SEC.) =   7.12
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12733.00 =    2689.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12733.00 TO NODE  12734.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    431.00  DOWNSTREAM(FEET) =    367.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1654.48   CHANNEL SLOPE =  0.0386
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.31
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.977
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       64.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     222.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.77
  AVERAGE FLOW DEPTH(FEET) =   2.26   TRAVEL TIME(MIN.) =   4.08
  Tc(MIN.) =   24.18
  SUBAREA AREA(ACRES) =    64.05       SUBAREA RUNOFF(CFS) =   96.65
  EFFECTIVE AREA(ACRES) =    164.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      164.5         PEAK FLOW RATE(CFS) =     248.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.41   FLOW VELOCITY(FEET/SEC.) =   6.97
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12734.00 =    4344.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    367.11  DOWNSTREAM(FEET) =    252.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.98   CHANNEL SLOPE =  0.0611
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.814
  SUBAREA LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     265.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.39
  AVERAGE FLOW DEPTH(FEET) =   2.20   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   27.92
  SUBAREA AREA(ACRES) =    26.02       SUBAREA RUNOFF(CFS) =   35.46
  EFFECTIVE AREA(ACRES) =    190.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      190.5         PEAK FLOW RATE(CFS) =     259.68
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.18   FLOW VELOCITY(FEET/SEC.) =   8.31
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12740.00 =    6225.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.92
  RAINFALL INTENSITY(INCH/HR) =   1.81
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     190.54
  TOTAL STREAM AREA(ACRES) =     190.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     259.68

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22490.85   25.23    1.918  0.30( 0.30) 0.99    5687.2   40500.00
      1    23331.94   27.24    1.841  0.30( 0.30) 0.99    6413.0   31500.00
      1    23983.86   28.81    1.780  0.30( 0.30) 0.99    6976.4   40440.00
      1    24251.72   29.73    1.744  0.30( 0.30) 0.99    7340.7   12710.00
      1    24854.38   31.95    1.682  0.30( 0.30) 0.99    8183.0   31600.00
      1    25328.83   33.76    1.634  0.30( 0.30) 0.99    8854.2   31810.00
      1    26144.45   37.29    1.539  0.30( 0.30) 0.99   10239.6   31400.00
      1    27964.62   45.66    1.376  0.30( 0.30) 0.99   13416.0   40100.00
      1    29454.64   55.00    1.255  0.30( 0.30) 0.99   16727.8   11801.00
      1    31457.88   65.98    1.163  0.30( 0.30) 0.99   21307.6   11530.00
      1    32520.30   70.44    1.132  0.30( 0.30) 0.99   23625.6   11701.00
      1    33415.56   73.96    1.109  0.30( 0.30) 0.99   25694.6   11910.00
      1    36099.33   84.36    1.038  0.30( 0.30) 0.99   32414.1   10800.00
      1    36798.57   88.65    1.009  0.30( 0.30) 0.99   35356.8   11130.00
      1    36854.13   98.24    0.964  0.30( 0.30) 0.99   40395.5   12410.00
      1    36600.80  106.49    0.929  0.30( 0.30) 0.99   44137.6   11201.00
      1    36328.69  111.42    0.907  0.30( 0.30) 0.99   45867.4   12201.00
```

1	35477.68	118.38	0.877	0.30(0.30)	0.99	47722.7	12231.00
1	35090.27	121.26	0.867	0.30(0.30)	0.99	48399.0	12101.10
1	34342.02	126.07	0.858	0.30(0.30)	0.99	49359.1	10400.00
1	33156.89	133.87	0.842	0.30(0.30)	0.99	50653.7	12010.00
1	32105.38	139.73	0.830	0.30(0.30)	0.99	51002.3	10210.00
1	31658.99	142.67	0.824	0.30(0.30)	0.99	51117.8	12000.00
1	28522.49	167.43	0.774	0.30(0.30)	0.99	51740.6	10100.00
2	259.68	27.92	1.814	0.30(0.30)	1.00	190.5	12730.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22741.60	25.23	1.918	0.30(0.30)	0.99	5859.3	40500.00
2	23589.67	27.24	1.841	0.30(0.30)	0.99	6598.8	31500.00
3	23875.48	27.92	1.814	0.30(0.30)	0.99	6848.8	12730.00
4	24237.66	28.81	1.780	0.30(0.30)	0.99	7166.9	40440.00
5	24499.40	29.73	1.744	0.30(0.30)	0.99	7531.3	12710.00
6	25091.38	31.95	1.682	0.30(0.30)	0.99	8373.5	31600.00
7	25557.53	33.76	1.634	0.30(0.30)	0.99	9044.7	31810.00
8	26357.01	37.29	1.539	0.30(0.30)	0.99	10430.2	31400.00
9	28149.12	45.66	1.376	0.30(0.30)	0.99	13606.6	40100.00
10	29618.34	55.00	1.255	0.30(0.30)	0.99	16918.4	11801.00
11	31605.81	65.98	1.163	0.30(0.30)	0.99	21498.2	11530.00
12	32663.05	70.44	1.132	0.30(0.30)	0.99	23816.1	11701.00
13	33554.22	73.96	1.109	0.30(0.30)	0.99	25885.1	11910.00
14	36225.92	84.36	1.038	0.30(0.30)	0.99	32604.6	10800.00
15	36920.19	88.65	1.009	0.30(0.30)	0.99	35547.3	11130.00
16	36968.06	98.24	0.964	0.30(0.30)	0.99	40586.1	12410.00
17	36708.59	106.49	0.929	0.30(0.30)	0.99	44328.2	11201.00
18	36432.82	111.42	0.907	0.30(0.30)	0.99	46057.9	12201.00
19	35576.64	118.38	0.877	0.30(0.30)	0.99	47913.3	12231.00
20	35187.59	121.26	0.867	0.30(0.30)	0.99	48589.5	12101.10
21	34437.66	126.07	0.858	0.30(0.30)	0.99	49549.7	10400.00
22	33249.82	133.87	0.842	0.30(0.30)	0.99	50844.2	12010.00
23	32196.26	139.73	0.830	0.30(0.30)	0.99	51192.9	10210.00
24	31748.85	142.67	0.824	0.30(0.30)	0.99	51308.4	12000.00
25	28603.71	167.43	0.774	0.30(0.30)	0.99	51931.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 36968.06 Tc(MIN.) = 98.24
EFFECTIVE AREA(ACRES) = 40586.07 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51931.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

****
FLOW PROCESS FROM NODE 12740.00 TO NODE 12741.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 252.10 DOWNSTREAM(FEET) = 247.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 401.47 CHANNEL SLOPE = 0.0127
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

*ESTIMATED CHANNEL HEIGHT(FEET) = 7.81
CHANNEL FLOW THRU SUBAREA(CFS) = 36968.06
FLOW VELOCITY(FEET/SEC.) = 19.80 FLOW DEPTH(FEET) = 7.81
TRAVEL TIME(MIN.) = 0.34 Tc(MIN.) = 98.57
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

****
FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610313X.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	209.49	22.94	0.30(0.29)	0.97	132.0	31300.00

TOTAL AREA(ACRES) = 132.0

****
FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22741.60	25.63	1.903	0.30(0.30)	0.99	5859.3	40500.00
2	23589.67	27.63	1.825	0.30(0.30)	0.99	6598.8	31500.00
3	23875.48	28.31	1.799	0.30(0.30)	0.99	6848.8	12730.00
4	24237.66	29.20	1.765	0.30(0.30)	0.99	7166.9	40440.00
5	24499.40	30.12	1.731	0.30(0.30)	0.99	7531.3	12710.00
6	25091.38	32.33	1.672	0.30(0.30)	0.99	8373.5	31600.00
7	25557.53	34.14	1.623	0.30(0.30)	0.99	9044.7	31810.00
8	26357.01	37.67	1.529	0.30(0.30)	0.99	10430.2	31400.00
9	28149.12	46.03	1.370	0.30(0.30)	0.99	13606.6	40100.00
10	29618.34	55.36	1.251	0.30(0.30)	0.99	16918.4	11801.00
11	31605.81	66.34	1.160	0.30(0.30)	0.99	21498.2	11530.00
12	32663.05	70.80	1.130	0.30(0.30)	0.99	23816.1	11701.00
13	33554.22	74.31	1.106	0.30(0.30)	0.99	25885.1	11910.00
14	36225.92	84.70	1.036	0.30(0.30)	0.99	32604.6	10800.00
15	36920.19	88.99	1.007	0.30(0.30)	0.99	35547.3	11130.00
16	36968.06	98.57	0.963	0.30(0.30)	0.99	40586.1	12410.00
17	36708.59	106.83	0.927	0.30(0.30)	0.99	44328.2	11201.00
18	36432.82	111.76	0.906	0.30(0.30)	0.99	46057.9	12201.00
19	35576.64	118.72	0.876	0.30(0.30)	0.99	47913.3	12231.00
20	35187.59	121.60	0.867	0.30(0.30)	0.99	48589.5	12101.10
21	34437.66	126.42	0.857	0.30(0.30)	0.99	49549.7	10400.00
22	33249.82	134.22	0.841	0.30(0.30)	0.99	50844.2	12010.00
23	32196.26	140.08	0.829	0.30(0.30)	0.99	51192.9	10210.00
24	31748.85	143.02	0.823	0.30(0.30)	0.99	51308.4	12000.00
25	28603.71	167.80	0.773	0.30(0.30)	0.99	51931.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	209.49	22.94	2.052	0.30(0.29)	0.97	132.0	31300.00

LONGEST FLOWPATH FROM NODE 31300.00 TO NODE 12741.00 = 5775.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22461.03	22.94	2.052	0.30(0.30)	0.99	5376.9	31300.00
2	22933.31	25.63	1.903	0.30(0.30)	0.99	5991.3	40500.00
3	23772.19	27.63	1.825	0.30(0.30)	0.99	6730.8	31500.00
4	24054.87	28.31	1.799	0.30(0.30)	0.99	6980.8	12730.00
5	24412.98	29.20	1.765	0.30(0.30)	0.99	7298.9	40440.00
6	24670.65	30.12	1.731	0.30(0.30)	0.99	7663.2	12710.00
7	25255.60	32.33	1.672	0.30(0.30)	0.99	8505.5	31600.00
8	25716.01	34.14	1.623	0.30(0.30)	0.99	9176.7	31810.00
9	26504.30	37.67	1.529	0.30(0.30)	0.99	10562.1	31400.00
10	28277.43	46.03	1.370	0.30(0.30)	0.99	13738.5	40100.00
11	29732.48	55.36	1.251	0.30(0.30)	0.99	17050.3	11801.00
12	31709.16	66.34	1.160	0.30(0.30)	0.99	21630.1	11530.00
13	32762.81	70.80	1.130	0.30(0.30)	0.99	23948.1	11701.00
14	33651.15	74.31	1.106	0.30(0.30)	0.99	26017.1	11910.00
15	36314.48	84.70	1.036	0.30(0.30)	0.99	32736.6	10800.00
16	37005.30	88.99	1.007	0.30(0.30)	0.99	35679.3	11130.00
17	37047.93	98.57	0.963	0.30(0.30)	0.99	40718.0	12410.00
18	36784.21	106.83	0.927	0.30(0.30)	0.99	44460.2	11201.00
19	36505.89	111.76	0.906	0.30(0.30)	0.99	46189.9	12201.00
20	35646.12	118.72	0.876	0.30(0.30)	0.99	48045.2	12231.00
21	35256.03	121.60	0.867	0.30(0.30)	0.99	48721.5	12101.10
22	34504.94	126.42	0.857	0.30(0.30)	0.99	49681.6	10400.00
23	33315.20	134.22	0.841	0.30(0.30)	0.99	50976.2	12010.00
24	32260.23	140.08	0.829	0.30(0.30)	0.99	51324.9	10210.00
25	31812.10	143.02	0.823	0.30(0.30)	0.99	51440.3	12000.00
26	28660.98	167.80	0.773	0.30(0.30)	0.99	52063.1	10100.00

TOTAL AREA(ACRES) = 52063.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 37047.93 Tc(MIN.) = 98.575
EFFECTIVE AREA(ACRES) = 40718.04 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 52063.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

****
FLOW PROCESS FROM NODE 12741.00 TO NODE 12800.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 247.00 DOWNSTREAM(FEET) = 240.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 819.00 CHANNEL SLOPE = 0.0085
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.76
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.959

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	17.31	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37053.07
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.36
AVERAGE FLOW DEPTH(FEET) = 8.76 TRAVEL TIME(MIN.) = 0.79
Tc(MIN.) = 99.36
SUBAREA AREA(ACRES) = 17.31 SUBAREA RUNOFF(CFS) = 10.27
EFFECTIVE AREA(ACRES) = 40735.35 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 52080.4 PEAK FLOW RATE(CFS) = 37047.93
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.76 FLOW VELOCITY(FEET/SEC.) = 17.36
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.
==
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 52080.4 TC(MIN.) = 99.36
EFFECTIVE AREA(ACRES) = 40735.35 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.993
PEAK FLOW RATE(CFS) = 37047.93

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22461.03	23.87	1.996	0.30(0.30)	0.99	5394.2	31300.00
2	22933.31	26.55	1.867	0.30(0.30)	0.99	6008.6	40500.00
3	23772.19	28.54	1.790	0.30(0.30)	0.99	6748.1	31500.00
4	24054.87	29.22	1.764	0.30(0.30)	0.99	6998.1	12730.00
5	24412.98	30.10	1.731	0.30(0.30)	0.99	7316.2	40440.00
6	24670.65	31.02	1.707	0.30(0.30)	0.99	7680.5	12710.00
7	25255.60	33.23	1.648	0.30(0.30)	0.99	8522.8	31600.00
8	25716.01	35.03	1.600	0.30(0.30)	0.99	9194.0	31810.00
9	26504.30	38.55	1.506	0.30(0.30)	0.99	10579.4	31400.00
10	28277.43	46.89	1.356	0.30(0.30)	0.99	13755.9	40100.00
11	29732.48	56.21	1.242	0.30(0.30)	0.99	17067.7	11801.00
12	31709.16	67.17	1.155	0.30(0.30)	0.99	21647.4	11530.00
13	32762.81	71.61	1.124	0.30(0.30)	0.99	23965.4	11701.00
14	33651.15	75.12	1.101	0.30(0.30)	0.99	26034.4	11910.00
15	36314.48	85.50	1.030	0.30(0.30)	0.99	32753.9	10800.00
16	37005.30	89.78	1.002	0.30(0.30)	0.99	35696.6	11130.00
17	37047.93	99.36	0.959	0.30(0.30)	0.99	40735.3	12410.00
18	36784.21	107.62	0.924	0.30(0.30)	0.99	44477.5	11201.00
19	36505.89	112.55	0.902	0.30(0.30)	0.99	46207.2	12201.00
20	35646.12	119.52	0.872	0.30(0.30)	0.99	48062.5	12231.00
21	35256.03	122.40	0.865	0.30(0.30)	0.99	48738.8	12101.10
22	34504.94	127.22	0.855	0.30(0.30)	0.99	49699.0	10400.00
23	33315.20	135.04	0.839	0.30(0.30)	0.99	50993.5	12010.00
24	32260.23	140.90	0.827	0.30(0.30)	0.99	51342.2	10210.00
25	31812.10	143.85	0.822	0.30(0.30)	0.99	51457.7	12000.00
26	28660.98	168.66	0.771	0.30(0.30)	0.99	52080.4	10100.00

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
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                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S28.DAT
  TIME/DATE OF STUDY: 09:47 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.460
   2)   10.00;  3.494
   3)   15.00;  2.672
   4)   20.00;  2.231
   5)   25.00;  1.927
   6)   30.00;  1.734
   7)   40.00;  1.467
   8)   50.00;  1.306
   9)   60.00;  1.203
  10)   90.00;  1.000
  11)  120.00;  0.870
  12)  180.00;  0.748
  13)  360.00;  0.556
  14) 1200.00;  0.244
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610501X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1506.93   25.94  0.30( 0.29) 0.98    1025.8   50120.00
      2     1480.85   27.19  0.30( 0.29) 0.98    1040.8   50150.00
      3     1382.53   30.77  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1506.93   25.94  0.30( 0.29) 0.98    1025.8   50120.00
      2     1480.85   27.19  0.30( 0.29) 0.98    1040.8   50150.00
      3     1382.53   30.77  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =      1063.4
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1063.4  TC(MIN.) =     25.94
  EFFECTIVE AREA(ACRES) =   1025.75  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.981
  PEAK FLOW RATE(CFS)   =    1506.93

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1506.93   25.94    1.891  0.30( 0.29) 0.98    1025.8   50120.00
      2     1480.85   27.19    1.842  0.30( 0.29) 0.98    1040.8   50150.00
      3     1382.53   30.77    1.713  0.30( 0.29) 0.98    1063.4   50100.00
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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                          Analysis prepared by:
```

FILE NAME: S29.DAT
TIME/DATE OF STUDY: 09:47 09/12/2017

==========

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

==========

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
USER-DEFINED TABLED RAINFALL USED
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	5.442
2)	10.00;	3.485
3)	15.00;	2.667
4)	20.00;	2.227
5)	25.00;	1.925
6)	30.00;	1.732
7)	40.00;	1.466
8)	50.00;	1.304
9)	60.00;	1.201
10)	90.00;	0.998
11)	120.00;	0.867
12)	180.00;	0.746
13)	360.00;	0.553
14)	1200.00;	0.243

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****

FLOW PROCESS FROM NODE 12740.00 TO NODE 12800.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<

==========

PEAK FLOWRATE TABLE FILE NAME: S27.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22933.31	26.55	0.30(0.30)	0.99	6008.6	40500.00
2	24670.65	31.02	0.30(0.30)	0.99	7680.5	12710.00
3	25716.01	35.03	0.30(0.30)	0.99	9194.0	31810.00
4	26504.30	38.55	0.30(0.30)	0.99	10579.4	31400.00
5	28277.43	46.89	0.30(0.30)	0.99	13755.9	40100.00
6	29732.48	56.21	0.30(0.30)	0.99	17067.7	11801.00
7	31709.16	67.17	0.30(0.30)	0.99	21647.4	11530.00
8	32762.81	71.61	0.30(0.30)	0.99	23965.4	11701.00
9	33651.15	75.12	0.30(0.30)	0.99	26034.4	11910.00
10	36314.48	85.50	0.30(0.30)	0.99	32753.9	10800.00
11	37005.30	89.78	0.30(0.30)	0.99	35696.6	11130.00
12	37047.93	99.36	0.30(0.30)	0.99	40735.3	12410.00
13	36784.21	107.62	0.30(0.30)	0.99	44477.5	11201.00
14	36505.89	112.55	0.30(0.30)	0.99	46207.2	12201.00
15	35646.12	119.52	0.30(0.30)	0.99	48062.5	12231.00
16	34504.94	127.22	0.30(0.30)	0.99	49699.0	10400.00
17	33315.20	135.04	0.30(0.30)	0.99	50993.5	12010.00
18	32260.23	140.90	0.30(0.30)	0.99	51342.2	10210.00
19	31812.10	143.85	0.30(0.30)	0.99	51457.7	12000.00
20	28660.98	168.66	0.30(0.30)	0.99	52080.4	10100.00

TOTAL AREA(ACRES) = 52080.4

****

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<

==========

PEAK FLOWRATE TABLE FILE NAME: S28.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1506.93	25.94	0.30(0.29)	0.98	1025.8	50120.00
2	1480.85	27.19	0.30(0.29)	0.98	1040.8	50150.00
3	1382.53	30.77	0.30(0.29)	0.98	1063.4	50100.00

TOTAL AREA(ACRES) = 1063.4

****

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0

>>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

==========

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1506.93	25.94	0.30(0.29)	0.98	1025.8	50120.00
2	1480.85	27.19	0.30(0.29)	0.98	1040.8	50150.00
3	1382.53	30.77	0.30(0.29)	0.98	1063.4	50100.00

TOTAL AREA(ACRES) = 1063.4

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****************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1506.93   25.94    1.889  0.30( 0.29) 0.98    1025.8   50120.00
      2     1480.85   27.19    1.840  0.30( 0.29) 0.98    1040.8   50150.00
      3     1382.53   30.77    1.712  0.30( 0.29) 0.98    1063.4   50100.00
  LONGEST FLOWPATH FROM NODE  50150.00 TO NODE  12800.00 =   11349.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22933.31   26.55    1.865  0.30( 0.30) 0.99    6008.6   40500.00
      2    24670.65   31.02    1.705  0.30( 0.30) 0.99    7680.5   12710.00
      3    25716.01   35.03    1.598  0.30( 0.30) 0.99    9194.0   31810.00
      4    26504.30   38.55    1.505  0.30( 0.30) 0.99   10579.4   31400.00
      5    28277.43   46.89    1.354  0.30( 0.30) 0.99   13755.9   40100.00
      6    29732.48   56.21    1.240  0.30( 0.30) 0.99   17067.7   11801.00
      7    31709.16   67.17    1.153  0.30( 0.30) 0.99   21647.4   11530.00
      8    32762.81   71.61    1.122  0.30( 0.30) 0.99   23965.4   11701.00
      9    33651.15   75.12    1.099  0.30( 0.30) 0.99   26034.4   11910.00
     10    36314.48   85.50    1.028  0.30( 0.30) 0.99   32753.9   10800.00
     11    37005.30   89.78    1.000  0.30( 0.30) 0.99   35696.6   11130.00
     12    37047.93   99.36    0.957  0.30( 0.30) 0.99   40735.3   12410.00
     13    36784.21  107.62    0.921  0.30( 0.30) 0.99   44477.5   11201.00
     14    36505.89  112.55    0.900  0.30( 0.30) 0.99   46207.2   12201.00
     15    35646.12  119.52    0.869  0.30( 0.30) 0.99   48062.5   12231.00
     16    34504.94  127.22    0.852  0.30( 0.30) 0.99   49699.0   10400.00
     17    33315.20  135.04    0.837  0.30( 0.30) 0.99   50993.5   12010.00
     18    32260.23  140.90    0.825  0.30( 0.30) 0.99   51342.2   10210.00
     19    31812.10  143.85    0.819  0.30( 0.30) 0.99   51457.7   12000.00
     20    28660.98  168.66    0.769  0.30( 0.30) 0.99   52080.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24248.13   25.94    1.889  0.30( 0.30) 0.99    6895.1   50120.00
      2    24427.43   26.55    1.865  0.30( 0.30) 0.99    7041.8   40500.00
      3    24661.79   27.19    1.840  0.30( 0.30) 0.99    7287.7   50150.00
      4    25954.51   30.77    1.712  0.30( 0.30) 0.99    8649.0   50100.00
      5    26046.59   31.02    1.705  0.30( 0.30) 0.99    8743.9   12710.00
      6    26987.91   35.03    1.598  0.30( 0.30) 0.99   10257.4   31810.00
      7    27685.05   38.55    1.505  0.30( 0.30) 0.99   11642.8   31400.00
      8    29311.49   46.89    1.354  0.30( 0.30) 0.99   14819.2   40100.00
      9    30655.05   56.21    1.240  0.30( 0.30) 0.99   18131.0   11801.00
     10    32546.31   67.17    1.153  0.30( 0.30) 0.99   22710.8   11530.00
     11    33570.59   71.61    1.122  0.30( 0.30) 0.99   25028.8   11701.00
     12    34435.76   75.12    1.099  0.30( 0.30) 0.99   27097.8   11910.00
     13    37030.62   85.50    1.028  0.30( 0.30) 0.99   33817.3   10800.00
     14    37693.18   89.78    1.000  0.30( 0.30) 0.99   36760.0   11130.00
     15    37694.45   99.36    0.957  0.30( 0.30) 0.99   41798.7   12410.00
```



```
     16    37395.55  107.62    0.921  0.30( 0.30) 0.99   45540.9   11201.00
     17    37096.21  112.55    0.900  0.30( 0.30) 0.99   47270.6   12201.00
     18    36206.76  119.52    0.869  0.30( 0.30) 0.99   49125.9   12231.00
     19    35049.32  127.22    0.852  0.30( 0.30) 0.99   50762.3   10400.00
     20    33844.21  135.04    0.837  0.30( 0.30) 0.99   52056.9   12010.00
     21    32777.70  140.90    0.825  0.30( 0.30) 0.99   52405.6   10210.00
     22    32323.77  143.85    0.819  0.30( 0.30) 0.99   52521.0   12000.00
     23    29123.84  168.66    0.769  0.30( 0.30) 0.99   53143.8   10100.00
    TOTAL AREA(ACRES) =     53143.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    37694.45  Tc(MIN.) =   99.361
  EFFECTIVE AREA(ACRES) =  41798.73  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53143.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12801.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.00  DOWNSTREAM(FEET) =    234.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.96   CHANNEL SLOPE =  0.0054
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.07
  CHANNEL FLOW THRU SUBAREA(CFS) =   37694.45
  FLOW VELOCITY(FEET/SEC.) =  14.96   FLOW DEPTH(FEET) =  10.07
  TRAVEL TIME(MIN.) =   1.24   Tc(MIN.) =  100.60
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610502X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       79.82   10.80  0.30( 0.28) 0.94      28.9   50200.00
    TOTAL AREA(ACRES) =       28.9

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24248.13	27.37	1.834	0.30(0.30)	0.99	6895.1	50120.00
2	24427.43	27.98	1.810	0.30(0.30)	0.99	7041.8	40500.00
3	24661.79	28.61	1.785	0.30(0.30)	0.99	7287.7	50150.00
4	25954.51	32.17	1.674	0.30(0.30)	0.99	8649.0	50100.00
5	26046.59	32.42	1.668	0.30(0.30)	0.99	8743.9	12710.00
6	26987.91	36.41	1.561	0.30(0.30)	0.99	10257.4	31810.00
7	27685.05	39.92	1.468	0.30(0.30)	0.99	11642.8	31400.00
8	29311.49	48.24	1.333	0.30(0.30)	0.99	14819.2	40100.00
9	30655.05	57.53	1.226	0.30(0.30)	0.99	18131.0	11801.00
10	32546.31	68.46	1.144	0.30(0.30)	0.99	22710.8	11530.00
11	33570.59	72.90	1.114	0.30(0.30)	0.99	25028.8	11701.00
12	34435.76	76.40	1.090	0.30(0.30)	0.99	27097.8	11910.00
13	37030.62	86.74	1.020	0.30(0.30)	0.99	33817.3	10800.00
14	37693.18	91.01	0.994	0.30(0.30)	0.99	36760.0	11130.00
15	37694.45	100.60	0.952	0.30(0.30)	0.99	41798.7	12410.00
16	37395.55	108.86	0.916	0.30(0.30)	0.99	45540.9	11201.00
17	37096.21	113.80	0.894	0.30(0.30)	0.99	47270.6	12201.00
18	36206.76	120.77	0.865	0.30(0.30)	0.99	49125.9	12231.00
19	35049.32	128.49	0.850	0.30(0.30)	0.99	50762.3	10400.00
20	33844.21	136.32	0.834	0.30(0.30)	0.99	52056.9	12010.00
21	32777.70	142.20	0.822	0.30(0.30)	0.99	52405.6	10210.00
22	32323.77	145.15	0.816	0.30(0.30)	0.99	52521.0	12000.00
23	29123.84	170.00	0.766	0.30(0.30)	0.99	53143.8	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	79.82	10.80	3.355	0.30(0.28)	0.94	28.9	50200.00

LONGEST FLOWPATH FROM NODE 50200.00 TO NODE 12801.00 = 1426.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19112.31	10.80	3.355	0.30(0.30)	0.99	2748.7	50200.00
2	24288.45	27.37	1.834	0.30(0.30)	0.99	6924.0	50120.00
3	24467.14	27.98	1.810	0.30(0.30)	0.99	7070.6	40500.00
4	24700.87	28.61	1.785	0.30(0.30)	0.99	7316.6	50150.00
5	25990.69	32.17	1.674	0.30(0.30)	0.99	8677.8	50100.00
6	26082.60	32.42	1.668	0.30(0.30)	0.99	8772.8	12710.00
7	27021.17	36.41	1.561	0.30(0.30)	0.99	10286.2	31810.00
8	27715.89	39.92	1.468	0.30(0.30)	0.99	11671.7	31400.00
9	29338.80	48.24	1.333	0.30(0.30)	0.99	14848.1	40100.00
10	30679.60	57.53	1.226	0.30(0.30)	0.99	18159.9	11801.00
11	32568.72	68.46	1.144	0.30(0.30)	0.99	22739.7	11530.00
12	33592.22	72.90	1.114	0.30(0.30)	0.99	25057.6	11701.00
13	34456.77	76.40	1.090	0.30(0.30)	0.99	27126.6	11910.00
14	37049.81	86.74	1.020	0.30(0.30)	0.99	33846.1	10800.00
15	37711.69	91.01	0.994	0.30(0.30)	0.99	36788.9	11130.00
16	37711.88	100.60	0.952	0.30(0.30)	0.99	41827.6	12410.00
17	37412.03	108.86	0.916	0.30(0.30)	0.99	45569.7	11201.00
18	37112.13	113.80	0.894	0.30(0.30)	0.99	47299.4	12201.00
19	36221.94	120.77	0.865	0.30(0.30)	0.99	49154.8	12231.00
20	35064.09	128.49	0.850	0.30(0.30)	0.99	50791.2	10400.00
21	33858.57	136.32	0.834	0.30(0.30)	0.99	52085.7	12010.00
22	32791.75	142.20	0.822	0.30(0.30)	0.99	52434.4	10210.00

23	32337.67	145.15	0.816	0.30(0.30)	0.99	52549.9	12000.00
24	29136.44	170.00	0.766	0.30(0.30)	0.99	53172.6	10100.00

TOTAL AREA(ACRES) = 53172.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 37711.88 Tc(MIN.) = 100.599
EFFECTIVE AREA(ACRES) = 41827.61 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53172.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

****
FLOW PROCESS FROM NODE 12801.00 TO NODE 12901.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 234.00 DOWNSTREAM(FEET) = 216.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2009.32 CHANNEL SLOPE = 0.0090
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.73
CHANNEL FLOW THRU SUBAREA(CFS) = 37711.88
FLOW VELOCITY(FEET/SEC.) = 17.74 FLOW DEPTH(FEET) = 8.73
TRAVEL TIME(MIN.) = 1.89 Tc(MIN.) = 102.49
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610312X.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	499.11	30.27	0.30(0.29)	0.96	385.8	31200.00

TOTAL AREA(ACRES) = 385.8

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19112.31	13.17	2.966	0.30(0.30)	0.99	2748.7	50200.00
2	24288.45	29.56	1.749	0.30(0.30)	0.99	6924.0	50120.00
3	24467.14	30.17	1.728	0.30(0.30)	0.99	7070.6	40500.00
4	24700.87	30.79	1.711	0.30(0.30)	0.99	7316.6	50150.00
5	25990.69	34.31	1.617	0.30(0.30)	0.99	8677.8	50100.00
6	26082.60	34.56	1.611	0.30(0.30)	0.99	8772.8	12710.00
7	27021.17	38.53	1.505	0.30(0.30)	0.99	10286.2	31810.00
8	27715.89	42.01	1.433	0.30(0.30)	0.99	11671.7	31400.00
9	29338.80	50.29	1.301	0.30(0.30)	0.99	14848.1	40100.00
10	30679.60	59.55	1.206	0.30(0.30)	0.99	18159.9	11801.00

```
   11    32568.72   70.45    1.130  0.30( 0.30) 0.99   22739.7   11530.00
   12    33592.22   74.86    1.100  0.30( 0.30) 0.99   25057.6   11701.00
   13    34456.77   78.34    1.077  0.30( 0.30) 0.99   27126.6   11910.00
   14    37049.81   88.64    1.007  0.30( 0.30) 0.99   33846.1   10800.00
   15    37711.69   92.90    0.985  0.30( 0.30) 0.99   36788.9   11130.00
   16    37711.88  102.49    0.943  0.30( 0.30) 0.99   41827.6   12410.00
   17    37412.03  110.75    0.907  0.30( 0.30) 0.99   45569.7   11201.00
   18    37112.13  115.70    0.886  0.30( 0.30) 0.99   47299.4   12201.00
   19    36221.94  122.69    0.862  0.30( 0.30) 0.99   49154.8   12231.00
   20    35064.09  130.43    0.846  0.30( 0.30) 0.99   50791.2   10400.00
   21    33858.57  138.28    0.830  0.30( 0.30) 0.99   52085.7   12010.00
   22    32791.75  144.18    0.818  0.30( 0.30) 0.99   52434.4   10210.00
   23    32337.67  147.14    0.812  0.30( 0.30) 0.99   52549.9   12000.00
   24    29136.44  172.06    0.762  0.30( 0.30) 0.99   53172.6   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      499.11   30.27    1.725  0.30( 0.29) 0.96     385.8   31200.00
LONGEST FLOWPATH FROM NODE  31200.00 TO NODE  12901.00 =   11169.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    19516.92   13.17    2.966  0.30( 0.30) 0.99    2916.6   50200.00
    2    24784.02   29.56    1.749  0.30( 0.30) 0.99    7300.7   50120.00
    3    24965.46   30.17    1.728  0.30( 0.30) 0.99    7455.0   40500.00
    4    25006.21   30.27    1.725  0.30( 0.30) 0.99    7498.5   31200.00
    5    25195.18   30.79    1.711  0.30( 0.30) 0.99    7702.4   50150.00
    6    26452.55   34.31    1.617  0.30( 0.30) 0.99    9063.6   50100.00
    7    26542.14   34.56    1.611  0.30( 0.30) 0.99    9158.6   12710.00
    8    27444.09   38.53    1.505  0.30( 0.30) 0.99   10672.0   31810.00
    9    28113.91   42.01    1.433  0.30( 0.30) 0.99   12057.5   31400.00
   10    29690.86   50.29    1.301  0.30( 0.30) 0.99   15233.9   40100.00
   11    30998.55   59.55    1.206  0.30( 0.30) 0.99   18545.7   11801.00
   12    32861.54   70.45    1.130  0.30( 0.30) 0.99   23125.5   11530.00
   13    33874.67   74.86    1.100  0.30( 0.30) 0.99   25443.4   11701.00
   14    34731.05   78.34    1.077  0.30( 0.30) 0.99   27512.4   11910.00
   15    37299.91   88.64    1.007  0.30( 0.30) 0.99   34231.9   10800.00
   16    37954.20   92.90    0.985  0.30( 0.30) 0.99   37174.6   11130.00
   17    37939.86  102.49    0.943  0.30( 0.30) 0.99   42213.4   12410.00
   18    37627.49  110.75    0.907  0.30( 0.30) 0.99   45955.5   11201.00
   19    37320.10  115.70    0.886  0.30( 0.30) 0.99   47685.2   12201.00
   20    36421.50  122.69    0.862  0.30( 0.30) 0.99   49540.6   12231.00
   21    35258.24  130.43    0.846  0.30( 0.30) 0.99   51177.0   10400.00
   22    34047.23  138.28    0.830  0.30( 0.30) 0.99   52471.5   12010.00
   23    32976.28  144.18    0.818  0.30( 0.30) 0.99   52820.2   10210.00
   24    32520.12  147.14    0.812  0.30( 0.30) 0.99   52935.7   12000.00
   25    29301.45  172.06    0.762  0.30( 0.30) 0.99   53558.4   10100.00
  TOTAL AREA(ACRES) =     53558.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    37954.20  Tc(MIN.) =   92.901
EFFECTIVE AREA(ACRES) =  37174.62  AREA-AVERAGED Fm(INCH/HR) =  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
TOTAL AREA(ACRES) =    53558.4
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610503X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      562.80   23.65  0.30( 0.30) 0.99     366.1   50300.00
    TOTAL AREA(ACRES) =      366.1

****************************************************************************
  FLOW PROCESS FROM NODE  12901.00 TO NODE  12901.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    19516.92   13.17    2.966  0.30( 0.30) 0.99    2916.6   50200.00
      2    24784.02   29.56    1.749  0.30( 0.30) 0.99    7300.7   50120.00
      3    24965.46   30.17    1.728  0.30( 0.30) 0.99    7455.0   40500.00
      4    25006.21   30.27    1.725  0.30( 0.30) 0.99    7498.5   31200.00
      5    25195.18   30.79    1.711  0.30( 0.30) 0.99    7702.4   50150.00
      6    26452.55   34.31    1.617  0.30( 0.30) 0.99    9063.6   50100.00
      7    26542.14   34.56    1.611  0.30( 0.30) 0.99    9158.6   12710.00
      8    27444.09   38.53    1.505  0.30( 0.30) 0.99   10672.0   31810.00
      9    28113.91   42.01    1.433  0.30( 0.30) 0.99   12057.5   31400.00
     10    29690.86   50.29    1.301  0.30( 0.30) 0.99   15233.9   40100.00
     11    30998.55   59.55    1.206  0.30( 0.30) 0.99   18545.7   11801.00
     12    32861.54   70.45    1.130  0.30( 0.30) 0.99   23125.5   11530.00
     13    33874.67   74.86    1.100  0.30( 0.30) 0.99   25443.4   11701.00
     14    34731.05   78.34    1.077  0.30( 0.30) 0.99   27512.4   11910.00
     15    37299.91   88.64    1.007  0.30( 0.30) 0.99   34231.9   10800.00
     16    37954.20   92.90    0.985  0.30( 0.30) 0.99   37174.6   11130.00
     17    37939.86  102.49    0.943  0.30( 0.30) 0.99   42213.4   12410.00
     18    37627.49  110.75    0.907  0.30( 0.30) 0.99   45955.5   11201.00
     19    37320.10  115.70    0.886  0.30( 0.30) 0.99   47685.2   12201.00
     20    36421.50  122.69    0.862  0.30( 0.30) 0.99   49540.6   12231.00
     21    35258.24  130.43    0.846  0.30( 0.30) 0.99   51177.0   10400.00
     22    34047.23  138.28    0.830  0.30( 0.30) 0.99   52471.5   12010.00
     23    32976.28  144.18    0.818  0.30( 0.30) 0.99   52820.2   10210.00
     24    32520.12  147.14    0.812  0.30( 0.30) 0.99   52935.7   12000.00
     25    29301.45  172.06    0.762  0.30( 0.30) 0.99   53558.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
     1      562.80   23.65    2.006  0.30( 0.30) 0.99     366.1   50300.00
 LONGEST FLOWPATH FROM NODE  50300.00 TO NODE  12901.00 =    8614.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    20006.35   13.17    2.966  0.30( 0.30) 0.99    3120.5   50200.00
     2    23449.19   23.65    2.006  0.30( 0.30) 0.99    6087.3   50300.00
     3    25262.10   29.56    1.749  0.30( 0.30) 0.99    7666.8   50120.00
     4    25436.49   30.17    1.728  0.30( 0.30) 0.99    7821.2   40500.00
     5    25476.30   30.27    1.725  0.30( 0.30) 0.99    7864.6   31200.00
     6    25660.72   30.79    1.711  0.30( 0.30) 0.99    8068.5   50150.00
     7    26887.28   34.31    1.617  0.30( 0.30) 0.99    9429.7   50100.00
     8    26974.68   34.56    1.611  0.30( 0.30) 0.99    9524.7   12710.00
     9    27841.87   38.53    1.505  0.30( 0.30) 0.99   11038.1   31810.00
    10    28488.06   42.01    1.433  0.30( 0.30) 0.99   12423.6   31400.00
    11    30021.37   50.29    1.301  0.30( 0.30) 0.99   15600.0   40100.00
    12    31297.64   59.55    1.206  0.30( 0.30) 0.99   18911.8   11801.00
    13    33135.82   70.45    1.130  0.30( 0.30) 0.99   23491.6   11530.00
    14    34139.11   74.86    1.100  0.30( 0.30) 0.99   25809.5   11701.00
    15    34987.73   78.34    1.077  0.30( 0.30) 0.99   27878.5   11910.00
    16    37533.65   88.64    1.007  0.30( 0.30) 0.99   34598.0   10800.00
    17    38180.73   92.90    0.985  0.30( 0.30) 0.99   37540.7   11130.00
    18    38152.61  102.49    0.943  0.30( 0.30) 0.99   42579.5   12410.00
    19    37828.35  110.75    0.907  0.30( 0.30) 0.99   46321.6   11201.00
    20    37513.85  115.70    0.886  0.30( 0.30) 0.99   48051.3   12201.00
    21    36607.28  122.69    0.862  0.30( 0.30) 0.99   49906.7   12231.00
    22    35438.88  130.43    0.846  0.30( 0.30) 0.99   51543.1   10400.00
    23    34222.65  138.28    0.830  0.30( 0.30) 0.99   52837.6   12010.00
    24    33147.79  144.18    0.818  0.30( 0.30) 0.99   53186.3   10210.00
    25    32689.65  147.14    0.812  0.30( 0.30) 0.99   53301.8   12000.00
    26    29454.43  172.06    0.762  0.30( 0.30) 0.99   53924.5   10100.00
   TOTAL AREA(ACRES) =     53924.5

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    38180.73  Tc(MIN.) =   92.901
 EFFECTIVE AREA(ACRES) =  37540.74  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =    53924.5
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12901.00 TO NODE  12902.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    216.00  DOWNSTREAM(FEET) =    215.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   122.04   CHANNEL SLOPE =  0.0082
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.01
 CHANNEL FLOW THRU SUBAREA(CFS) =   38180.73
 FLOW VELOCITY(FEET/SEC.) =  17.29   FLOW DEPTH(FEET) =   9.01
 TRAVEL TIME(MIN.) =   0.12   Tc(MIN.) =   93.02
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12902.00 =  115038.03 FEET.

****************************************************************************
```



```
 FLOW PROCESS FROM NODE  12902.00 TO NODE  12902.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12902.00 TO NODE  12903.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    215.00  DOWNSTREAM(FEET) =    214.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   895.53   CHANNEL SLOPE =  0.0011
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  15.69
 CHANNEL FLOW THRU SUBAREA(CFS) =   38180.73
 FLOW VELOCITY(FEET/SEC.) =   8.74   FLOW DEPTH(FEET) =  15.69
 TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   94.73
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12903.00 =  115933.56 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12902.00 TO NODE  12903.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12903.00 TO NODE  12903.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610504X.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
     1      142.31   16.55  0.30( 0.29) 0.97      70.7   50400.00
   TOTAL AREA(ACRES) =       70.7

****************************************************************************
 FLOW PROCESS FROM NODE  12903.00 TO NODE  12903.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    20006.35   15.41    2.631  0.30( 0.30) 0.99    3120.5   50200.00
     2    23449.19   25.78    1.895  0.30( 0.30) 0.99    6087.3   50300.00
     3    25262.10   31.63    1.689  0.30( 0.30) 0.99    7666.8   50120.00
     4    25436.49   32.24    1.673  0.30( 0.30) 0.99    7821.2   40500.00
     5    25476.30   32.34    1.670  0.30( 0.30) 0.99    7864.6   31200.00
     6    25660.72   32.86    1.656  0.30( 0.30) 0.99    8068.5   50150.00
     7    26887.28   36.34    1.563  0.30( 0.30) 0.99    9429.7   50100.00
     8    26974.68   36.59    1.557  0.30( 0.30) 0.99    9524.7   12710.00
     9    27841.87   40.54    1.457  0.30( 0.30) 0.99   11038.1   31810.00
    10    28488.06   44.01    1.401  0.30( 0.30) 0.99   12423.6   31400.00
```

11	30021.37	52.26	1.281	0.30(0.30)	0.99	15600.0	40100.00
12	31297.64	61.49	1.191	0.30(0.30)	0.99	18911.8	11801.00
13	33135.82	72.35	1.117	0.30(0.30)	0.99	23491.6	11530.00
14	34139.11	76.75	1.088	0.30(0.30)	0.99	25809.5	11701.00
15	34987.73	80.22	1.064	0.30(0.30)	0.99	27878.5	11910.00
16	37533.65	90.48	0.996	0.30(0.30)	0.99	34598.0	10800.00
17	38180.73	94.73	0.977	0.30(0.30)	0.99	37540.7	11130.00
18	38152.61	104.31	0.936	0.30(0.30)	0.99	42579.5	12410.00
19	37828.35	112.58	0.899	0.30(0.30)	0.99	46321.6	11201.00
20	37513.85	117.53	0.878	0.30(0.30)	0.99	48051.3	12201.00
21	36607.28	124.54	0.858	0.30(0.30)	0.99	49906.7	12231.00
22	35438.88	132.29	0.842	0.30(0.30)	0.99	51543.1	10400.00
23	34222.65	140.16	0.826	0.30(0.30)	0.99	52837.6	12010.00
24	33147.79	146.08	0.814	0.30(0.30)	0.99	53186.3	10210.00
25	32689.65	149.05	0.808	0.30(0.30)	0.99	53301.8	12000.00
26	29454.43	174.04	0.758	0.30(0.30)	0.99	53924.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	142.31	16.55	2.530	0.30(0.29)	0.97	70.7	50400.00

LONGEST FLOWPATH FROM NODE 50400.00 TO NODE 12903.00 = 3607.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20144.79	15.41	2.631	0.30(0.30)	0.99	3186.3	50200.00
2	20528.57	16.55	2.530	0.30(0.30)	0.99	3518.5	50400.00
3	23551.09	25.78	1.895	0.30(0.30)	0.99	6158.0	50300.00
4	25350.88	31.63	1.689	0.30(0.30)	0.99	7737.4	50120.00
5	25524.25	32.24	1.673	0.30(0.30)	0.99	7891.8	40500.00
6	25563.88	32.34	1.670	0.30(0.30)	0.99	7935.3	31200.00
7	25747.44	32.86	1.656	0.30(0.30)	0.99	8139.2	50150.00
8	26968.10	36.34	1.563	0.30(0.30)	0.99	9500.4	50100.00
9	27055.07	36.59	1.557	0.30(0.30)	0.99	9595.4	12710.00
10	27915.94	40.54	1.457	0.30(0.30)	0.99	11108.8	31810.00
11	28558.56	44.01	1.401	0.30(0.30)	0.99	12494.3	31400.00
12	30084.22	52.26	1.281	0.30(0.30)	0.99	15670.7	40100.00
13	31354.78	61.49	1.191	0.30(0.30)	0.99	18982.5	11801.00
14	33188.29	72.35	1.117	0.30(0.30)	0.99	23562.3	11530.00
15	34189.69	76.75	1.088	0.30(0.30)	0.99	25880.2	11701.00
16	35036.82	80.22	1.064	0.30(0.30)	0.99	27949.2	11910.00
17	37578.39	90.48	0.996	0.30(0.30)	0.99	34668.7	10800.00
18	38224.29	94.73	0.977	0.30(0.30)	0.99	37611.4	11130.00
19	38193.51	104.31	0.936	0.30(0.30)	0.99	42650.2	12410.00
20	37866.95	112.58	0.899	0.30(0.30)	0.99	46392.3	11201.00
21	37551.07	117.53	0.878	0.30(0.30)	0.99	48122.0	12201.00
22	36643.24	124.54	0.858	0.30(0.30)	0.99	49977.4	12231.00
23	35473.84	132.29	0.842	0.30(0.30)	0.99	51613.8	10400.00
24	34256.61	140.16	0.826	0.30(0.30)	0.99	52908.3	12010.00
25	33180.98	146.08	0.814	0.30(0.30)	0.99	53257.0	10210.00
26	32722.47	149.05	0.808	0.30(0.30)	0.99	53372.5	12000.00
27	29484.05	174.04	0.758	0.30(0.30)	0.99	53995.2	10100.00

TOTAL AREA(ACRES) = 53995.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 38224.29 Tc(MIN.) = 94.727

EFFECTIVE AREA(ACRES) = 37611.42 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53995.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12904.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 214.00 DOWNSTREAM(FEET) = 213.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 767.57 CHANNEL SLOPE = 0.0013
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 15.05
CHANNEL FLOW THRU SUBAREA(CFS) = 38224.29
FLOW VELOCITY(FEET/SEC.) = 9.23 FLOW DEPTH(FEET) = 15.05
TRAVEL TIME(MIN.) = 1.39 Tc(MIN.) = 96.11
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610311X.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	158.76	27.53	0.30(0.29)	0.97	114.8	31100.00

TOTAL AREA(ACRES) = 114.8

****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20144.79	17.10	2.482	0.30(0.30)	0.99	3186.3	50200.00
2	20528.57	18.24	2.382	0.30(0.30)	0.99	3518.5	50400.00
3	23551.09	27.39	1.833	0.30(0.30)	0.99	6158.0	50300.00
4	25350.88	33.21	1.647	0.30(0.30)	0.99	7737.4	50120.00
5	25524.25	33.81	1.631	0.30(0.30)	0.99	7891.8	40500.00
6	25563.88	33.91	1.628	0.30(0.30)	0.99	7935.3	31200.00
7	25747.44	34.42	1.614	0.30(0.30)	0.99	8139.2	50150.00
8	26968.10	37.89	1.522	0.30(0.30)	0.99	9500.4	50100.00
9	27055.07	38.13	1.516	0.30(0.30)	0.99	9595.4	12710.00
10	27915.94	42.07	1.433	0.30(0.30)	0.99	11108.8	31810.00

11	28558.56	45.52	1.377	0.30(0.30)	0.99	12494.3	31400.00
12	30084.22	53.75	1.265	0.30(0.30)	0.99	15670.7	40100.00
13	31354.78	62.97	1.181	0.30(0.30)	0.99	18982.5	11801.00
14	33188.29	73.80	1.108	0.30(0.30)	0.99	23562.3	11530.00
15	34189.69	78.19	1.078	0.30(0.30)	0.99	25880.2	11701.00
16	35036.82	81.64	1.055	0.30(0.30)	0.99	27949.2	11910.00
17	37578.39	91.87	0.990	0.30(0.30)	0.99	34668.7	10800.00
18	38224.29	96.11	0.971	0.30(0.30)	0.99	37611.4	11130.00
19	38193.51	105.70	0.929	0.30(0.30)	0.99	42650.2	12410.00
20	37866.95	113.97	0.893	0.30(0.30)	0.99	46392.3	11201.00
21	37551.07	118.93	0.872	0.30(0.30)	0.99	48122.0	12201.00
22	36643.24	125.94	0.855	0.30(0.30)	0.99	49977.4	12231.00
23	35473.84	133.71	0.839	0.30(0.30)	0.99	51613.8	10400.00
24	34256.61	141.60	0.823	0.30(0.30)	0.99	52908.3	12010.00
25	33180.98	147.53	0.811	0.30(0.30)	0.99	53257.0	10210.00
26	32722.47	150.51	0.805	0.30(0.30)	0.99	53372.5	12000.00
27	29484.05	175.54	0.755	0.30(0.30)	0.99	53995.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	158.76	27.53	1.827	0.30(0.29)	0.97	114.8	31100.00

LONGEST FLOWPATH FROM NODE 31100.00 TO NODE 12904.00 = 6503.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20285.43	17.10	2.482	0.30(0.30)	0.99	3257.6	50200.00
2	20671.71	18.24	2.382	0.30(0.30)	0.99	3594.6	50400.00
3	23709.61	27.39	1.833	0.30(0.30)	0.99	6272.2	50300.00
4	23751.62	27.53	1.827	0.30(0.30)	0.99	6309.4	31100.00
5	25490.97	33.21	1.647	0.30(0.30)	0.99	7852.3	50120.00
6	25662.69	33.81	1.631	0.30(0.30)	0.99	8006.6	40500.00
7	25702.04	33.91	1.628	0.30(0.30)	0.99	8050.1	31200.00
8	25884.18	34.42	1.614	0.30(0.30)	0.99	8254.0	50150.00
9	27095.34	37.89	1.522	0.30(0.30)	0.99	9615.2	50100.00
10	27181.63	38.13	1.516	0.30(0.30)	0.99	9710.2	12710.00
11	28033.92	42.07	1.433	0.30(0.30)	0.99	11223.6	31810.00
12	28670.75	45.52	1.377	0.30(0.30)	0.99	12609.1	31400.00
13	30184.93	53.75	1.265	0.30(0.30)	0.99	15785.5	40100.00
14	31446.76	62.97	1.181	0.30(0.30)	0.99	19097.3	11801.00
15	33272.70	73.80	1.108	0.30(0.30)	0.99	23677.1	11530.00
16	34271.04	78.19	1.078	0.30(0.30)	0.99	25995.0	11701.00
17	35115.75	81.64	1.055	0.30(0.30)	0.99	28064.0	11910.00
18	37650.64	91.87	0.990	0.30(0.30)	0.99	34783.5	10800.00
19	38294.63	96.11	0.971	0.30(0.30)	0.99	37726.2	11130.00
20	38259.52	105.70	0.929	0.30(0.30)	0.99	42765.0	12410.00
21	37929.23	113.97	0.893	0.30(0.30)	0.99	46507.1	11201.00
22	37611.12	118.93	0.872	0.30(0.30)	0.99	48236.8	12201.00
23	36701.56	125.94	0.855	0.30(0.30)	0.99	50092.2	12231.00
24	35530.55	133.71	0.839	0.30(0.30)	0.99	51728.6	10400.00
25	34311.67	141.60	0.823	0.30(0.30)	0.99	53023.1	12010.00
26	33234.81	147.53	0.811	0.30(0.30)	0.99	53371.8	10210.00
27	32775.68	150.51	0.805	0.30(0.30)	0.99	53487.3	12000.00
28	29532.04	175.54	0.755	0.30(0.30)	0.99	54110.0	10100.00

TOTAL AREA(ACRES) = 54110.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 38294.63 Tc(MIN.) = 96.113
EFFECTIVE AREA(ACRES) = 37726.23 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 54110.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 54110.0 TC(MIN.) = 96.11
EFFECTIVE AREA(ACRES) = 37726.23 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.993
PEAK FLOW RATE(CFS) = 38294.63

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20285.43	17.10	2.482	0.30(0.30)	0.99	3257.6	50200.00
2	20671.71	18.24	2.382	0.30(0.30)	0.99	3594.6	50400.00
3	23709.61	27.39	1.833	0.30(0.30)	0.99	6272.2	50300.00
4	23751.62	27.53	1.827	0.30(0.30)	0.99	6309.4	31100.00
5	25490.97	33.21	1.647	0.30(0.30)	0.99	7852.3	50120.00
6	25662.69	33.81	1.631	0.30(0.30)	0.99	8006.6	40500.00
7	25702.04	33.91	1.628	0.30(0.30)	0.99	8050.1	31200.00
8	25884.18	34.42	1.614	0.30(0.30)	0.99	8254.0	50150.00
9	27095.34	37.89	1.522	0.30(0.30)	0.99	9615.2	50100.00
10	27181.63	38.13	1.516	0.30(0.30)	0.99	9710.2	12710.00
11	28033.92	42.07	1.433	0.30(0.30)	0.99	11223.6	31810.00
12	28670.75	45.52	1.377	0.30(0.30)	0.99	12609.1	31400.00
13	30184.93	53.75	1.265	0.30(0.30)	0.99	15785.5	40100.00
14	31446.76	62.97	1.181	0.30(0.30)	0.99	19097.3	11801.00
15	33272.70	73.80	1.108	0.30(0.30)	0.99	23677.1	11530.00
16	34271.04	78.19	1.078	0.30(0.30)	0.99	25995.0	11701.00
17	35115.75	81.64	1.055	0.30(0.30)	0.99	28064.0	11910.00
18	37650.64	91.87	0.990	0.30(0.30)	0.99	34783.5	10800.00
19	38294.63	96.11	0.971	0.30(0.30)	0.99	37726.2	11130.00
20	38259.52	105.70	0.929	0.30(0.30)	0.99	42765.0	12410.00
21	37929.23	113.97	0.893	0.30(0.30)	0.99	46507.1	11201.00
22	37611.12	118.93	0.872	0.30(0.30)	0.99	48236.8	12201.00
23	36701.56	125.94	0.855	0.30(0.30)	0.99	50092.2	12231.00
24	35530.55	133.71	0.839	0.30(0.30)	0.99	51728.6	10400.00
25	34311.67	141.60	0.823	0.30(0.30)	0.99	53023.1	12010.00
26	33234.81	147.53	0.811	0.30(0.30)	0.99	53371.8	10210.00
27	32775.68	150.51	0.805	0.30(0.30)	0.99	53487.3	12000.00
28	29532.04	175.54	0.755	0.30(0.30)	0.99	54110.0	10100.00

==========

END OF RATIONAL METHOD ANALYSIS

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                           Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
*                                                                        *
*                                                                        *
*                                                                        *
 ************************************************************************

  FILE NAME: S30.DAT
  TIME/DATE OF STUDY: 11:59 04/03/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.440
   2)   10.00;  3.011
   3)   15.00;  2.390
   4)   20.00;  2.029
   5)   25.00;  1.787
   6)   30.00;  1.600
   7)   40.00;  1.368
   8)   50.00;  1.205
   9)   60.00;  1.060
  10)   90.00;  0.862
  11)  120.00;  0.732
  12)  180.00;  0.593
  13)  360.00;  0.412
  14) 1440.00;  0.172
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
```



```
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE  13000.00 TO NODE  13001.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   279.24
  ELEVATION DATA: UPSTREAM(FEET) =   1187.54  DOWNSTREAM(FEET) =   1104.45

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.560
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.423
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.65      0.30     1.000     0    8.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.83
  TOTAL AREA(ACRES) =      0.65   PEAK FLOW RATE(CFS) =      1.83

****************************************************************************
  FLOW PROCESS FROM NODE  13001.00 TO NODE  13002.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1104.45  DOWNSTREAM(FEET) =   1034.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   736.73   CHANNEL SLOPE =  0.0945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.975
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       19.74      0.30     0.968     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.968
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.08
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   1.73
  Tc(MIN.) =   10.29
  SUBAREA AREA(ACRES) =    19.74       SUBAREA RUNOFF(CFS) =   47.69
  EFFECTIVE AREA(ACRES) =     20.39     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      49.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   8.94
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13002.00 =    1015.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13002.00 TO NODE  13003.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1034.82  DOWNSTREAM(FEET) =    986.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1305.95   CHANNEL SLOPE =  0.0368
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.686
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.90      0.30     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     140.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.36
  AVERAGE FLOW DEPTH(FEET) =   1.21   TRAVEL TIME(MIN.) =   2.33
  Tc(MIN.) =   12.62
  SUBAREA AREA(ACRES) =    83.90       SUBAREA RUNOFF(CFS) =  182.32
  EFFECTIVE AREA(ACRES) =    104.29     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =      104.3         PEAK FLOW RATE(CFS) =     226.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.58   FLOW VELOCITY(FEET/SEC.) =  10.86
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13003.00 =    2321.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13003.00 TO NODE  13004.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    986.71  DOWNSTREAM(FEET) =    939.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.54   CHANNEL SLOPE =  0.0361
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.446
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.30     0.871     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.871
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     272.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.41
  AVERAGE FLOW DEPTH(FEET) =   1.77   TRAVEL TIME(MIN.) =   1.93
```



```
  Tc(MIN.) =   14.55
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   93.30
  EFFECTIVE AREA(ACRES) =    151.73     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =     297.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.85   FLOW VELOCITY(FEET/SEC.) =  11.71
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13004.00 =    3640.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.06  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1954.61   CHANNEL SLOPE =  0.0397
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.05
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.240
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       77.87      0.30     0.856     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.856
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     366.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.89
  AVERAGE FLOW DEPTH(FEET) =   2.02   TRAVEL TIME(MIN.) =   2.53
  Tc(MIN.) =   17.07
  SUBAREA AREA(ACRES) =    77.87       SUBAREA RUNOFF(CFS) =  139.02
  EFFECTIVE AREA(ACRES) =    229.60     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =      229.6         PEAK FLOW RATE(CFS) =     408.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.15   FLOW VELOCITY(FEET/SEC.) =  13.30
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13020.00 =    5595.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.07
  RAINFALL INTENSITY(INCH/HR) =   2.24
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
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  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     229.60
  TOTAL STREAM AREA(ACRES) =     229.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     408.00

****************************************************************************
  FLOW PROCESS FROM NODE  13010.00 TO NODE  13011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   284.64
  ELEVATION DATA: UPSTREAM(FEET) =   1190.91  DOWNSTREAM(FEET) =   1110.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.716
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.378
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.91      0.30     1.000     0    8.72
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.52
  TOTAL AREA(ACRES) =      0.91   PEAK FLOW RATE(CFS) =      2.52

****************************************************************************
  FLOW PROCESS FROM NODE  13011.00 TO NODE  13012.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1110.50  DOWNSTREAM ELEVATION(FEET) = 1068.16
  STREET LENGTH(FEET) =   581.12   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.14
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =   10.74
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.19
  STREET FLOW TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =   10.28
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.976
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       10.46      0.30     1.000     -
```



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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   10.46      SUBAREA RUNOFF(CFS) =   25.19
  EFFECTIVE AREA(ACRES) =     11.37    AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =       11.4        PEAK FLOW RATE(CFS) =      27.38

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.02
  FLOW VELOCITY(FEET/SEC.) =  7.02   DEPTH*VELOCITY(FT*FT/SEC.) =   2.90
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13012.00 =     865.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13012.00 TO NODE  13013.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1068.16  DOWNSTREAM ELEVATION(FEET) =  994.58
  STREET LENGTH(FEET) =  1505.98   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.01
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.55
    HALFSTREET FLOOD WIDTH(FEET) =   21.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.04
  STREET FLOW TRAVEL TIME(MIN.) =   3.40   Tc(MIN.) =   13.68
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.554
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       35.49      0.30     0.901     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.901
  SUBAREA AREA(ACRES) =   35.49      SUBAREA RUNOFF(CFS) =   72.95
  EFFECTIVE AREA(ACRES) =     46.86    AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.93
  TOTAL AREA(ACRES) =       46.9        PEAK FLOW RATE(CFS) =      96.01

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  25.27
  FLOW VELOCITY(FEET/SEC.) =  8.14   DEPTH*VELOCITY(FT*FT/SEC.) =   5.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13013.00 =    2371.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13013.00 TO NODE  13014.00 IS CODE =  56
----------------------------------------------------------------------------
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    994.58  DOWNSTREAM(FEET) =    944.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1798.86   CHANNEL SLOPE =  0.0276
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.47
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.242
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.31      0.30     0.616     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.616
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     163.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.91
  AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   17.05
  SUBAREA AREA(ACRES) =    73.31       SUBAREA RUNOFF(CFS) =  135.75
  EFFECTIVE AREA(ACRES) =    120.17     AREA-AVERAGED Fm(INCH/HR) =   0.22
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.74
  TOTAL AREA(ACRES) =      120.2         PEAK FLOW RATE(CFS) =     218.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.68   FLOW VELOCITY(FEET/SEC.) =   9.72
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13014.00 =    4170.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    944.96  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1519.40   CHANNEL SLOPE =  0.0549
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.106
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.22      0.30     0.810     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.810
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     285.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.39
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   1.89
  Tc(MIN.) =   18.94
  SUBAREA AREA(ACRES) =    80.22       SUBAREA RUNOFF(CFS) =  134.49
  EFFECTIVE AREA(ACRES) =    200.39     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      200.4         PEAK FLOW RATE(CFS) =     338.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =  14.09
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.94
  RAINFALL INTENSITY(INCH/HR) =   2.11
  AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.77
  EFFECTIVE STREAM AREA(ACRES) =     200.39
  TOTAL STREAM AREA(ACRES) =     200.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     338.34

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      408.00   17.07    2.240  0.30( 0.27) 0.89     229.6   13000.00
      2      338.34   18.94    2.106  0.30( 0.23) 0.77     200.4   13010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      734.90   17.07    2.240  0.30( 0.25) 0.83     410.3   13000.00
      2      718.51   18.94    2.106  0.30( 0.25) 0.83     430.0   13010.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     734.90    Tc(MIN.) =    17.07
  EFFECTIVE AREA(ACRES) =     410.25   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =      430.0
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13020.00 TO NODE  13021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    861.53  DOWNSTREAM(FEET) =    843.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1274.71   CHANNEL SLOPE =  0.0139
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.050
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  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.78      0.30      0.818     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.818
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     800.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.05
  AVERAGE FLOW DEPTH(FEET) =   1.80   TRAVEL TIME(MIN.) =   2.64
  Tc(MIN.) =   19.71
  SUBAREA AREA(ACRES) =    80.78       SUBAREA RUNOFF(CFS) =  131.19
  EFFECTIVE AREA(ACRES) =    491.03     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =      510.8         PEAK FLOW RATE(CFS) =     795.72
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.79   FLOW VELOCITY(FEET/SEC.) =   8.04
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13021.00 =    6964.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      795.72   19.71    2.050  0.30( 0.25) 0.83     491.0   13000.00
      2      782.95   21.60    1.952  0.30( 0.25) 0.83     510.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     795.72  Tc(MIN.) =   19.71
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     491.03

****************************************************************************
  FLOW PROCESS FROM NODE  13021.00 TO NODE  13022.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    843.84  DOWNSTREAM(FEET) =    842.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1448.62   CHANNEL SLOPE =  0.0012
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.92
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.740
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.44      0.30     0.803     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.803
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     879.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.69
  AVERAGE FLOW DEPTH(FEET) =   3.87   TRAVEL TIME(MIN.) =   6.55
  Tc(MIN.) =   26.26
  SUBAREA AREA(ACRES) =   124.44       SUBAREA RUNOFF(CFS) =  167.88
  EFFECTIVE AREA(ACRES) =    615.47     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =      635.2         PEAK FLOW RATE(CFS) =     826.62
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  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.74   FLOW VELOCITY(FEET/SEC.) =   3.62
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13022.00 =    8413.33 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      826.62   26.26    1.740  0.30( 0.25) 0.83     615.5   13000.00
      2      812.15   28.19    1.668  0.30( 0.25) 0.82     635.2   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     826.62  Tc(MIN.) =   26.26
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     615.47

****************************************************************************
  FLOW PROCESS FROM NODE  13022.00 TO NODE  13023.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    842.14  DOWNSTREAM(FEET) =    806.85
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.95   CHANNEL SLOPE =  0.0246
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.656
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      324.46      0.30     0.786     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.786
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1033.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.59
  AVERAGE FLOW DEPTH(FEET) =   1.77   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =   28.52
  SUBAREA AREA(ACRES) =   324.46       SUBAREA RUNOFF(CFS) =  414.59
  EFFECTIVE AREA(ACRES) =    939.93     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      959.7         PEAK FLOW RATE(CFS) =    1194.50
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.92   FLOW VELOCITY(FEET/SEC.) =  11.17
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13023.00 =    9846.28 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1194.50   28.52    1.656  0.30( 0.24) 0.81     939.9   13000.00
      2     1162.67   30.46    1.589  0.30( 0.24) 0.81     959.7   13010.00
  NEW PEAK FLOW DATA ARE:
```

```
  PEAK FLOW RATE(CFS) =    1194.50  Tc(MIN.) =   28.52
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =     939.93

****************************************************************************
  FLOW PROCESS FROM NODE  13023.00 TO NODE  13024.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    806.85  DOWNSTREAM(FEET) =    767.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.17   CHANNEL SLOPE =  0.0423
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.82
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.614
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      367.12      0.30     0.795     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.795
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1421.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.15
  AVERAGE FLOW DEPTH(FEET) =   1.81   TRAVEL TIME(MIN.) =   1.11
  Tc(MIN.) =   29.62
  SUBAREA AREA(ACRES) =   367.12       SUBAREA RUNOFF(CFS) =  454.52
  EFFECTIVE AREA(ACRES) =   1307.05     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     1326.8         PEAK FLOW RATE(CFS) =    1613.97
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.95   FLOW VELOCITY(FEET/SEC.) =  14.82
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13024.00 =   10786.45 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1613.97   29.62    1.614  0.30( 0.24) 0.81    1307.1   13000.00
      2     1578.01   31.58    1.563  0.30( 0.24) 0.81    1326.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1613.97  Tc(MIN.) =   29.62
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1307.05

****************************************************************************
  FLOW PROCESS FROM NODE  13024.00 TO NODE  13025.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    767.07  DOWNSTREAM(FEET) =    697.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3026.62   CHANNEL SLOPE =  0.0230
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
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  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.49
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.516
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      315.24      0.30     0.867     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1792.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.60
  AVERAGE FLOW DEPTH(FEET) =   2.48   TRAVEL TIME(MIN.) =   4.00
  Tc(MIN.) =   33.63
  SUBAREA AREA(ACRES) =   315.24       SUBAREA RUNOFF(CFS) =  356.29
  EFFECTIVE AREA(ACRES) =   1622.29     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     1642.0         PEAK FLOW RATE(CFS) =    1854.72
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.53   FLOW VELOCITY(FEET/SEC.) =  12.74
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13025.00 =   13813.07 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1854.72   33.63    1.516  0.30( 0.25) 0.82    1622.3   13000.00
      2     1809.27   35.62    1.470  0.30( 0.25) 0.82    1642.0   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1854.72  Tc(MIN.) =   33.63
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    1622.29

****************************************************************************
  FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    697.38  DOWNSTREAM(FEET) =    662.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.69   CHANNEL SLOPE =  0.0147
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.06
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.436
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      374.11      0.30     0.748     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.748
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2058.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.38
  AVERAGE FLOW DEPTH(FEET) =   3.06   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   37.09
  SUBAREA AREA(ACRES) =   374.11       SUBAREA RUNOFF(CFS) =  407.82
  EFFECTIVE AREA(ACRES) =   1996.40     AREA-AVERAGED Fm(INCH/HR) =   0.24
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     2016.1         PEAK FLOW RATE(CFS) =    2145.36
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.13   FLOW VELOCITY(FEET/SEC.) =  11.54
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13026.00 =   16175.76 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2145.36   37.09    1.436  0.30( 0.24) 0.81    1996.4   13000.00
      2     2081.63   39.11    1.389  0.30( 0.24) 0.81    2016.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2145.36  Tc(MIN.) =   37.09
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1996.40
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     2016.1  TC(MIN.) =     37.09
  EFFECTIVE AREA(ACRES) =   1996.40  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.805
  PEAK FLOW RATE(CFS)   =    2145.36

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2145.36   37.09    1.436  0.30( 0.24) 0.81    1996.4   13000.00
      2     2081.63   39.11    1.389  0.30( 0.24) 0.81    2016.1   13010.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S31.DAT
  TIME/DATE OF STUDY: 11:59 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.440
   2)   10.00;  3.011
   3)   15.00;  2.390
   4)   20.00;  2.029
   5)   25.00;  1.787
   6)   30.00;  1.600
   7)   40.00;  1.368
   8)   50.00;  1.205
   9)   60.00;  1.060
  10)   90.00;  0.862
  11)  120.00;  0.732
  12)  180.00;  0.593
  13)  360.00;  0.412
  14) 1440.00;  0.172
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13100.00 TO NODE  13101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   282.58
  ELEVATION DATA: UPSTREAM(FEET) =   1069.66  DOWNSTREAM(FEET) =    969.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.312
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.493
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.94      0.30     1.000     0    8.31
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.70
  TOTAL AREA(ACRES) =      0.94   PEAK FLOW RATE(CFS) =      2.70

**************************************************************************
  FLOW PROCESS FROM NODE  13101.00 TO NODE  13102.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    969.92  DOWNSTREAM(FEET) =    807.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.89   CHANNEL SLOPE =  0.2444
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.27
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.925
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.66
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   2.38
  Tc(MIN.) =   10.69
  SUBAREA AREA(ACRES) =     7.67       SUBAREA RUNOFF(CFS) =   18.12
  EFFECTIVE AREA(ACRES) =      8.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.6          PEAK FLOW RATE(CFS) =      20.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.34   FLOW VELOCITY(FEET/SEC.) =   5.63
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13102.00 =     948.47 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13102.00 TO NODE  13103.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    807.20  DOWNSTREAM(FEET) =    769.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   691.01   CHANNEL SLOPE =  0.0539
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.606
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       20.65      0.30     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.48
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   2.57
  Tc(MIN.) =   13.26
  SUBAREA AREA(ACRES) =    20.65       SUBAREA RUNOFF(CFS) =   42.86
  EFFECTIVE AREA(ACRES) =     29.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3         PEAK FLOW RATE(CFS) =      60.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   5.08
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13103.00 =    1639.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   769.94  DOWNSTREAM(FEET) =   693.88
  FLOW LENGTH(FEET) =  1563.10   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  16.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.06
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.73
  PIPE TRAVEL TIME(MIN.) =   1.37    Tc(MIN.) =   14.63
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13104.00 =    3202.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.63
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.436
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       28.00      0.30     0.750     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.750
  SUBAREA AREA(ACRES) =   28.00      SUBAREA RUNOFF(CFS) =   55.73
  EFFECTIVE AREA(ACRES) =     57.26   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =       57.3       PEAK FLOW RATE(CFS) =     111.99

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   693.88  DOWNSTREAM(FEET) =   645.69
  FLOW LENGTH(FEET) =  1068.98   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.27
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     111.99
  PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =   15.47
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13105.00 =    4271.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.47
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.356
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.28      0.30     0.867     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
  SUBAREA AREA(ACRES) =   35.28      SUBAREA RUNOFF(CFS) =   66.56
  EFFECTIVE AREA(ACRES) =     92.54   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =       92.5       PEAK FLOW RATE(CFS) =     174.44

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.69  DOWNSTREAM(FEET) =   608.48
  FLOW LENGTH(FEET) =  1127.55   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  31.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.13
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     174.44
  PIPE TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =   16.35
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  81
```

```
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   16.35
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.292
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       37.68      0.30     0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  SUBAREA AREA(ACRES) =   37.68      SUBAREA RUNOFF(CFS) =   68.69
  EFFECTIVE AREA(ACRES) =    130.22   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =      130.2       PEAK FLOW RATE(CFS) =     237.78

******************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  10
------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 15.1
------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S30.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2145.36   37.09  0.30( 0.24) 0.81    1996.4   13000.00
      2     2081.63   39.11  0.30( 0.24) 0.81    2016.1   13010.00
    TOTAL AREA(ACRES) =     2016.1

******************************************************************************
  FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 14.0
------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2145.36   37.09  0.30( 0.24) 0.81    1996.4   13000.00
      2     2081.63   39.11  0.30( 0.24) 0.81    2016.1   13010.00
    TOTAL AREA(ACRES) =      2016.1

******************************************************************************
  FLOW PROCESS FROM NODE  13026.00 TO NODE  13106.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    662.66  DOWNSTREAM(FEET) =    608.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3098.88   CHANNEL SLOPE =  0.0175
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.347
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.28      0.30     0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2183.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.29
  AVERAGE FLOW DEPTH(FEET) =   3.01   TRAVEL TIME(MIN.) =   4.20
  Tc(MIN.) =   41.29
  SUBAREA AREA(ACRES) =    75.28       SUBAREA RUNOFF(CFS) =   75.92
  EFFECTIVE AREA(ACRES) =   2071.68     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     2091.4         PEAK FLOW RATE(CFS) =    2145.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.98   FLOW VELOCITY(FEET/SEC.) =  12.22
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2145.36   41.29    1.347  0.30( 0.24) 0.80    2071.7   13000.00
      2     2081.63   43.35    1.313  0.30( 0.24) 0.80    2091.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2145.36  Tc(MIN.) =   41.29
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    2071.68

******************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  11
------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2145.36   41.29    1.347  0.30( 0.24) 0.80    2071.7   13000.00
      2     2081.63   43.35    1.313  0.30( 0.24) 0.80    2091.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      237.78   16.35    2.292  0.30( 0.26) 0.88     130.2   13100.00
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1813.83   16.35    2.292  0.30( 0.24) 0.81     950.8   13100.00
```

```
      2     2272.37   41.29    1.347  0.30( 0.24) 0.81    2201.9   13000.00
      3     2204.69   43.35    1.313  0.30( 0.24) 0.81    2221.6   13010.00
    TOTAL AREA(ACRES) =      2221.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2272.37  Tc(MIN.) =   41.288
  EFFECTIVE AREA(ACRES) =   2201.90  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     2221.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13106.00 TO NODE  13107.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    608.48  DOWNSTREAM(FEET) =    584.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1650.20   CHANNEL SLOPE =  0.0147
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.32
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.309
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      190.45      0.30     0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2365.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.91
  AVERAGE FLOW DEPTH(FEET) =   3.31   TRAVEL TIME(MIN.) =   2.31
  Tc(MIN.) =   43.60
  SUBAREA AREA(ACRES) =   190.45       SUBAREA RUNOFF(CFS) =  185.62
  EFFECTIVE AREA(ACRES) =   2392.35     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     2412.1         PEAK FLOW RATE(CFS) =    2300.12
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.26   FLOW VELOCITY(FEET/SEC.) =  11.80
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13107.00 =   20924.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1924.89   18.81    2.115  0.30( 0.24) 0.80    1141.3   13100.00
      2     2300.13   43.60    1.309  0.30( 0.24) 0.80    2392.4   13000.00
      3     2245.42   45.69    1.275  0.30( 0.24) 0.80    2412.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2300.13  Tc(MIN.) =   43.60
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    2392.35

****************************************************************************
  FLOW PROCESS FROM NODE  13107.00 TO NODE  13108.00 IS CODE =  56
```



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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.29  DOWNSTREAM(FEET) =    563.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1061.67   CHANNEL SLOPE =  0.0193
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.12
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.288
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      314.12      0.30     0.939     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.939
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2442.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.20
  AVERAGE FLOW DEPTH(FEET) =   3.12   TRAVEL TIME(MIN.) =   1.34
  Tc(MIN.) =   44.94
  SUBAREA AREA(ACRES) =   314.12       SUBAREA RUNOFF(CFS) =  284.37
  EFFECTIVE AREA(ACRES) =   2706.47     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     2726.2         PEAK FLOW RATE(CFS) =    2537.44
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.19   FLOW VELOCITY(FEET/SEC.) =  13.37
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13108.00 =   21986.51 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2317.66   20.20    2.019  0.30( 0.25) 0.83    1455.4   13100.00
      2     2537.44   44.94    1.288  0.30( 0.25) 0.82    2706.5   13000.00
      3     2472.32   47.04    1.253  0.30( 0.25) 0.82    2726.2   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2537.44  Tc(MIN.) =   44.94
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2706.47

****************************************************************************
  FLOW PROCESS FROM NODE  13108.00 TO NODE  13109.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    563.78  DOWNSTREAM(FEET) =    541.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1657.28   CHANNEL SLOPE =  0.0134
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.61
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.250
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -      203.63      0.30     0.785     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.785
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2630.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.96
  AVERAGE FLOW DEPTH(FEET) =   3.61   TRAVEL TIME(MIN.) =   2.31
  Tc(MIN.) =   47.25
  SUBAREA AREA(ACRES) =   203.63       SUBAREA RUNOFF(CFS) =  185.91
  EFFECTIVE AREA(ACRES) =   2910.10     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     2929.8          PEAK FLOW RATE(CFS) =    2631.70
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.61   FLOW VELOCITY(FEET/SEC.) =  11.97
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13109.00 =   23643.79 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2474.10   22.56    1.905  0.30( 0.25) 0.83    1659.0   13100.00
      2     2631.70   47.25    1.250  0.30( 0.25) 0.82    2910.1   13000.00
      3     2558.77   49.37    1.215  0.30( 0.24) 0.82    2929.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2631.70  Tc(MIN.) =   47.25
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2910.10

****************************************************************************
  FLOW PROCESS FROM NODE  13109.00 TO NODE  13110.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    541.61  DOWNSTREAM(FEET) =    509.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2016.96   CHANNEL SLOPE =  0.0157
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.55
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.207
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      283.06      0.30     0.791     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.791
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2755.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.82
  AVERAGE FLOW DEPTH(FEET) =   3.54   TRAVEL TIME(MIN.) =   2.62
  Tc(MIN.) =   49.87
  SUBAREA AREA(ACRES) =   283.06       SUBAREA RUNOFF(CFS) =  247.08
  EFFECTIVE AREA(ACRES) =   3193.16     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3212.9          PEAK FLOW RATE(CFS) =    2766.83
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
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  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.55   FLOW VELOCITY(FEET/SEC.) =  12.84
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13110.00 =   25660.75 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2678.90   25.21    1.779  0.30( 0.25) 0.82    1942.1   13100.00
      2     2766.83   49.87    1.207  0.30( 0.24) 0.81    3193.2   13000.00
      3     2693.60   52.01    1.176  0.30( 0.24) 0.81    3212.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2766.83  Tc(MIN.) =   49.87
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3193.16

****************************************************************************
  FLOW PROCESS FROM NODE  13110.00 TO NODE  13111.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    509.94  DOWNSTREAM(FEET) =    461.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3058.95   CHANNEL SLOPE =  0.0160
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.61
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      248.05      0.30     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2869.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.06
  AVERAGE FLOW DEPTH(FEET) =   3.61   TRAVEL TIME(MIN.) =   3.90
  Tc(MIN.) =   53.77
  SUBAREA AREA(ACRES) =   248.05       SUBAREA RUNOFF(CFS) =  204.37
  EFFECTIVE AREA(ACRES) =   3441.21     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3460.9          PEAK FLOW RATE(CFS) =    2807.82
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.57   FLOW VELOCITY(FEET/SEC.) =  12.97
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13111.00 =   28719.70 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2735.10   29.12    1.633  0.30( 0.25) 0.82    2190.1   13100.00
      2     2807.82   53.77    1.150  0.30( 0.24) 0.81    3441.2   13000.00
      3     2725.96   55.95    1.119  0.30( 0.24) 0.81    3460.9   13010.00
  NEW PEAK FLOW DATA ARE:
```

```
  PEAK FLOW RATE(CFS) =    2807.82  Tc(MIN.) =   53.77
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3441.21

****************************************************************************
  FLOW PROCESS FROM NODE  13111.00 TO NODE  13112.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    461.07  DOWNSTREAM(FEET) =    452.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1781.78   CHANNEL SLOPE =  0.0047
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.12
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.100
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      179.91      0.30     0.694     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.694
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2880.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.60
  AVERAGE FLOW DEPTH(FEET) =   5.12   TRAVEL TIME(MIN.) =   3.45
  Tc(MIN.) =   57.23
  SUBAREA AREA(ACRES) =   179.91       SUBAREA RUNOFF(CFS) =  144.44
  EFFECTIVE AREA(ACRES) =   3621.12     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3640.9         PEAK FLOW RATE(CFS) =    2807.82
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.05   FLOW VELOCITY(FEET/SEC.) =   8.54
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13112.00 =   30501.48 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2767.74   32.59    1.540  0.30( 0.24) 0.81    2370.0   13100.00
      2     2807.82   57.23    1.100  0.30( 0.24) 0.81    3621.1   13000.00
      3     2725.96   59.43    1.068  0.30( 0.24) 0.81    3640.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2807.82  Tc(MIN.) =   57.23
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3621.12

****************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    452.77  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1625.01   CHANNEL SLOPE =  0.0155
```



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  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.64
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.070
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      155.96      0.30     0.836     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.836
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2865.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.94
  AVERAGE FLOW DEPTH(FEET) =   3.63   TRAVEL TIME(MIN.) =   2.09
  Tc(MIN.) =   59.32
  SUBAREA AREA(ACRES) =   155.96       SUBAREA RUNOFF(CFS) =  114.98
  EFFECTIVE AREA(ACRES) =   3777.08     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3796.8         PEAK FLOW RATE(CFS) =    2813.34
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.60   FLOW VELOCITY(FEET/SEC.) =  12.86
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2838.21   34.68    1.491  0.30( 0.24) 0.81    2526.0   13100.00
      2     2813.34   59.32    1.070  0.30( 0.24) 0.81    3777.1   13000.00
      3     2759.60   61.55    1.050  0.30( 0.24) 0.81    3796.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2838.21  Tc(MIN.) =   34.68
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    2526.01
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3796.8  TC(MIN.) =     34.68
  EFFECTIVE AREA(ACRES) =   2526.01  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.810
  PEAK FLOW RATE(CFS)   =    2838.21

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2838.21   34.68    1.491  0.30( 0.24) 0.81    2526.0   13100.00
      2     2813.34   59.32    1.070  0.30( 0.24) 0.81    3777.1   13000.00
      3     2759.60   61.55    1.050  0.30( 0.24) 0.81    3796.8   13010.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S32.DAT
  TIME/DATE OF STUDY: 11:59 04/03/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.440
   2)   10.00;  3.011
   3)   15.00;  2.390
   4)   20.00;  2.029
   5)   25.00;  1.787
   6)   30.00;  1.600
   7)   40.00;  1.368
   8)   50.00;  1.205
   9)   60.00;  1.060
  10)   90.00;  0.862
  11)  120.00;  0.732
  12)  180.00;  0.593
  13)  360.00;  0.412
  14) 1440.00;  0.172
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13200.00 TO NODE  13201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.57
  ELEVATION DATA: UPSTREAM(FEET) =   1069.04  DOWNSTREAM(FEET) =   1005.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.410
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.180
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.67      0.30     1.000     0    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.74
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      1.74

****************************************************************************
  FLOW PROCESS FROM NODE  13201.00 TO NODE  13202.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.76  DOWNSTREAM(FEET) =    896.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   747.55   CHANNEL SLOPE =  0.1455
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.657
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.62
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   12.85
  SUBAREA AREA(ACRES) =     7.41       SUBAREA RUNOFF(CFS) =   15.72
  EFFECTIVE AREA(ACRES) =      8.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.1         PEAK FLOW RATE(CFS) =      17.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   4.50
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13202.00 =    1046.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  31
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   896.98  DOWNSTREAM(FEET) =   840.27
  FLOW LENGTH(FEET) =  1789.59   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   9.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.51
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.14
  PIPE TRAVEL TIME(MIN.) =   2.59    Tc(MIN.) =   15.44
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13203.00 =    2835.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   15.44
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.358
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.89      0.30     0.731     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.731
  SUBAREA AREA(ACRES) =   38.89      SUBAREA RUNOFF(CFS) =   74.86
  EFFECTIVE AREA(ACRES) =     46.97   AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.78
  TOTAL AREA(ACRES) =       47.0       PEAK FLOW RATE(CFS) =      89.83

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   840.27  DOWNSTREAM(FEET) =   782.97
  FLOW LENGTH(FEET) =   992.54   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  19.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.40
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      89.83
  PIPE TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =   16.18
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13204.00 =    3828.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   16.18
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.305
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       83.09      0.30     0.645     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.645
  SUBAREA AREA(ACRES) =   83.09      SUBAREA RUNOFF(CFS) =  157.88
  EFFECTIVE AREA(ACRES) =    130.06   AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      130.1       PEAK FLOW RATE(CFS) =     245.46

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   782.97  DOWNSTREAM(FEET) =   692.52
  FLOW LENGTH(FEET) =  2046.57   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  25.62
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     245.46
  PIPE TRAVEL TIME(MIN.) =   1.33    Tc(MIN.) =   17.51
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13205.00 =    5874.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   17.51
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.209
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       88.51      0.30     0.679     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.679
  SUBAREA AREA(ACRES) =   88.51      SUBAREA RUNOFF(CFS) =  159.71
  EFFECTIVE AREA(ACRES) =    218.57   AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      218.6       PEAK FLOW RATE(CFS) =     393.92

****************************************************************************
  FLOW PROCESS FROM NODE  13205.00 TO NODE  13206.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    692.52  DOWNSTREAM(FEET) =    605.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2704.69   CHANNEL SLOPE =  0.0323
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.07
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.947
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      163.73      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     518.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.79
  AVERAGE FLOW DEPTH(FEET) =   3.00   TRAVEL TIME(MIN.) =   4.18
  Tc(MIN.) =   21.69
  SUBAREA AREA(ACRES) =   163.73       SUBAREA RUNOFF(CFS) =  249.01
  EFFECTIVE AREA(ACRES) =    382.30     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.76
  TOTAL AREA(ACRES) =      382.3         PEAK FLOW RATE(CFS) =     591.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.22   FLOW VELOCITY(FEET/SEC.) =  11.19
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13206.00 =    8579.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13206.00 TO NODE  13207.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.24  DOWNSTREAM(FEET) =    555.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2479.15   CHANNEL SLOPE =  0.0201
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.97
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.753
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      143.41      0.30     0.888     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.888
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     687.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.82
  AVERAGE FLOW DEPTH(FEET) =   3.92   TRAVEL TIME(MIN.) =   4.21
  Tc(MIN.) =   25.90
  SUBAREA AREA(ACRES) =   143.41       SUBAREA RUNOFF(CFS) =  191.92
  EFFECTIVE AREA(ACRES) =    525.71     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      525.7         PEAK FLOW RATE(CFS) =     716.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.01   FLOW VELOCITY(FEET/SEC.) =   9.92
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13207.00 =   11058.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    555.41  DOWNSTREAM(FEET) =    505.65
```



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  CHANNEL LENGTH THRU SUBAREA(FEET) =  1734.55   CHANNEL SLOPE =  0.0287
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.87
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.660
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.56      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     794.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.63
  AVERAGE FLOW DEPTH(FEET) =   3.86   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   28.39
  SUBAREA AREA(ACRES) =   123.56       SUBAREA RUNOFF(CFS) =  156.02
  EFFECTIVE AREA(ACRES) =    649.27     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      649.3         PEAK FLOW RATE(CFS) =     828.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.94   FLOW VELOCITY(FEET/SEC.) =  11.76
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.39
  RAINFALL INTENSITY(INCH/HR) =   1.66
  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81
  EFFECTIVE STREAM AREA(ACRES) =     649.27
  TOTAL STREAM AREA(ACRES) =     649.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     828.76

****************************************************************************
  FLOW PROCESS FROM NODE  13210.00 TO NODE  13211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   314.51
  ELEVATION DATA: UPSTREAM(FEET) =    949.80  DOWNSTREAM(FEET) =    828.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.525
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.432
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

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  NATURAL FAIR COVER
  "OPEN BRUSH"                -       1.96      0.30     1.000     0    8.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.53
  TOTAL AREA(ACRES) =      1.96   PEAK FLOW RATE(CFS) =      5.53

****************************************************************************
  FLOW PROCESS FROM NODE  13211.00 TO NODE  13212.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    828.64  DOWNSTREAM(FEET) =    767.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   652.49   CHANNEL SLOPE =  0.0930
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.48
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.863
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.07
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   2.67
  Tc(MIN.) =   11.19
  SUBAREA AREA(ACRES) =    11.95       SUBAREA RUNOFF(CFS) =   27.56
  EFFECTIVE AREA(ACRES) =     13.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.9         PEAK FLOW RATE(CFS) =      32.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   4.86
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13212.00 =     967.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13212.00 TO NODE  13213.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    767.94  DOWNSTREAM(FEET) =    706.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.91   CHANNEL SLOPE =  0.0635
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.484
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.30
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   14.24
  SUBAREA AREA(ACRES) =    27.07       SUBAREA RUNOFF(CFS) =   53.22
  EFFECTIVE AREA(ACRES) =     40.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.0         PEAK FLOW RATE(CFS) =      80.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   5.89
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13213.00 =    1934.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13213.00 TO NODE  13214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    706.43  DOWNSTREAM(FEET) =    659.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.11   CHANNEL SLOPE =  0.0497
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.35
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.246
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      96.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.72
  AVERAGE FLOW DEPTH(FEET) =   1.33   TRAVEL TIME(MIN.) =   2.76
  Tc(MIN.) =   17.00
  SUBAREA AREA(ACRES) =    18.09       SUBAREA RUNOFF(CFS) =   31.68
  EFFECTIVE AREA(ACRES) =     59.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       59.1         PEAK FLOW RATE(CFS) =     103.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   5.85
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13214.00 =    2883.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13214.00 TO NODE  13215.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    659.31  DOWNSTREAM(FEET) =    628.91
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```
 CHANNEL LENGTH THRU SUBAREA(FEET) =   970.24   CHANNEL SLOPE =  0.0313
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.05
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.040
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       71.42      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     159.44
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.69
 AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   2.84
 Tc(MIN.) =   19.84
 SUBAREA AREA(ACRES) =    71.42       SUBAREA RUNOFF(CFS) =  111.86
 EFFECTIVE AREA(ACRES) =    130.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      130.5         PEAK FLOW RATE(CFS) =     204.38
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.29   FLOW VELOCITY(FEET/SEC.) =   6.12
 LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13215.00 =    3853.26 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13215.00 TO NODE  13216.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    628.91  DOWNSTREAM(FEET) =    598.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =   922.63   CHANNEL SLOPE =  0.0331
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.42
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.922
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       36.33      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     230.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.47
 AVERAGE FLOW DEPTH(FEET) =   2.41   TRAVEL TIME(MIN.) =   2.38
 Tc(MIN.) =   22.22
 SUBAREA AREA(ACRES) =    36.33       SUBAREA RUNOFF(CFS) =   53.02
 EFFECTIVE AREA(ACRES) =    166.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      166.8         PEAK FLOW RATE(CFS) =     243.47
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.48

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  2.48   FLOW VELOCITY(FEET/SEC.) =   6.55
 LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13216.00 =    4775.89 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13216.00 TO NODE  13217.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    598.39  DOWNSTREAM(FEET) =    568.48
 CHANNEL LENGTH THRU SUBAREA(FEET) =   636.40   CHANNEL SLOPE =  0.0470
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.41
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.855
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       42.51      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     273.21
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.69
 AVERAGE FLOW DEPTH(FEET) =   2.40   TRAVEL TIME(MIN.) =   1.38
 Tc(MIN.) =   23.60
 SUBAREA AREA(ACRES) =    42.51       SUBAREA RUNOFF(CFS) =   59.49
 EFFECTIVE AREA(ACRES) =    209.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      209.3         PEAK FLOW RATE(CFS) =     292.93
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.49

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.49   FLOW VELOCITY(FEET/SEC.) =   7.85
 LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13217.00 =    5412.29 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    568.48  DOWNSTREAM(FEET) =    505.65
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.50   CHANNEL SLOPE =  0.0331
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.98
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.675
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       73.24      0.30     0.951     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     338.77
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.20
 AVERAGE FLOW DEPTH(FEET) =   2.96   TRAVEL TIME(MIN.) =   4.39
```

```
  Tc(MIN.) =   27.99
  SUBAREA AREA(ACRES) =    73.24       SUBAREA RUNOFF(CFS) =   91.63
  EFFECTIVE AREA(ACRES) =    282.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      282.6         PEAK FLOW RATE(CFS) =     350.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.01   FLOW VELOCITY(FEET/SEC.) =   7.28
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13220.00 =    7308.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.99
  RAINFALL INTENSITY(INCH/HR) =   1.68
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     282.57
  TOTAL STREAM AREA(ACRES) =     282.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     350.74

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      828.76   28.39    1.660  0.30( 0.24) 0.81     649.3   13200.00
      2      350.74   27.99    1.675  0.30( 0.30) 0.99     282.6   13210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1176.44   27.99    1.675  0.30( 0.26) 0.86     922.7   13210.00
      2     1175.70   28.39    1.660  0.30( 0.26) 0.86     931.8   13200.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1176.44    Tc(MIN.) =    27.99
  EFFECTIVE AREA(ACRES) =     922.71   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      931.8
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13220.00 TO NODE  13221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    505.65  DOWNSTREAM(FEET) =    478.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1949.14   CHANNEL SLOPE =  0.0137
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.03
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.586
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      108.50      0.30     0.637     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.637
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1244.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.33
  AVERAGE FLOW DEPTH(FEET) =   5.03   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =   30.62
  SUBAREA AREA(ACRES) =   108.50       SUBAREA RUNOFF(CFS) =  136.18
  EFFECTIVE AREA(ACRES) =   1031.21     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     1040.3         PEAK FLOW RATE(CFS) =    1238.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.02   FLOW VELOCITY(FEET/SEC.) =  12.32
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13221.00 =   14742.35 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1238.13   30.62    1.586  0.30( 0.25) 0.84    1031.2   13210.00
      2     1240.54   31.02    1.576  0.30( 0.25) 0.84    1040.3   13200.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1240.54  Tc(MIN.) =   31.02
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =    1040.34

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    478.94  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2078.70   CHANNEL SLOPE =  0.0247
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.43
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.524
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.26      0.30     0.699     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.699
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1292.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.48
```

```
 AVERAGE FLOW DEPTH(FEET) =   4.43   TRAVEL TIME(MIN.) =   2.24
 Tc(MIN.) =   33.26
 SUBAREA AREA(ACRES) =    87.26       SUBAREA RUNOFF(CFS) =  103.26
 EFFECTIVE AREA(ACRES) =   1127.60     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =     1127.6         PEAK FLOW RATE(CFS) =    1295.17
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.43

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.43   FLOW VELOCITY(FEET/SEC.) =  15.50
 LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1293.92   32.86    1.534  0.30( 0.25) 0.83    1118.5   13210.00
     2     1295.17   33.26    1.524  0.30( 0.25) 0.83    1127.6   13200.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1295.17  Tc(MIN.) =   33.26
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =    1127.60
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1127.6  TC(MIN.) =     33.26
 EFFECTIVE AREA(ACRES) =   1127.60  AREA-AVERAGED Fm(INCH/HR)=  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.828
 PEAK FLOW RATE(CFS)   =    1295.17

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1293.92   32.86    1.534  0.30( 0.25) 0.83    1118.5   13210.00
     2     1295.17   33.26    1.524  0.30( 0.25) 0.83    1127.6   13200.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S33.DAT
  TIME/DATE OF STUDY: 10:46 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.326
   2)   10.00;  3.430
   3)   15.00;  2.635
   4)   20.00;  2.204
   5)   25.00;  1.909
   6)   30.00;  1.717
   7)   40.00;  1.454
   8)   50.00;  1.292
   9)   60.00;  1.184
  10)   90.00;  0.982
  11)  120.00;  0.852
  12)  180.00;  0.728
  13)  360.00;  0.537
  14) 1200.00;  0.235
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S31.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2838.21   34.68  0.30( 0.24) 0.81    2526.0   13100.00
      2     2813.34   59.32  0.30( 0.24) 0.81    3777.1   13000.00
      3     2759.60   61.55  0.30( 0.24) 0.81    3796.8   13010.00
    TOTAL AREA(ACRES) =     3796.8

**************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S32.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1293.92   32.86  0.30( 0.25) 0.83    1118.5   13210.00
      2     1295.17   33.26  0.30( 0.25) 0.83    1127.6   13200.00
    TOTAL AREA(ACRES) =     1127.6

**************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1293.92   32.86  0.30( 0.25) 0.83    1118.5   13210.00
      2     1295.17   33.26  0.30( 0.25) 0.83    1127.6   13200.00
    TOTAL AREA(ACRES) =      1127.6

**************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  11
--------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1293.92   32.86    1.642  0.30( 0.25) 0.83    1118.5   13210.00
      2     1295.17   33.26    1.631  0.30( 0.25) 0.83    1127.6   13200.00
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2838.21   34.68    1.594  0.30( 0.24) 0.81    2526.0   13100.00
      2     2813.34   59.32    1.192  0.30( 0.24) 0.81    3777.1   13000.00
```

```
     3     2759.60   61.55    1.174  0.30( 0.24) 0.81    3796.8   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4078.10   32.86    1.642  0.30( 0.24) 0.82    3511.6   13210.00
      2     4092.03   33.26    1.631  0.30( 0.24) 0.82    3549.7   13200.00
      3     4098.34   34.68    1.594  0.30( 0.24) 0.82    3653.6   13100.00
      4     3696.95   59.32    1.192  0.30( 0.24) 0.81    4904.7   13000.00
      5     3626.53   61.55    1.174  0.30( 0.24) 0.81    4924.4   13010.00
    TOTAL AREA(ACRES) =      4924.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4098.34  Tc(MIN.) =   34.683
  EFFECTIVE AREA(ACRES) =   3653.61  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4924.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13223.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    416.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   864.00   CHANNEL SLOPE =  0.0129
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.51
  CHANNEL FLOW THRU SUBAREA(CFS) =    4098.34
  FLOW VELOCITY(FEET/SEC.) =  11.18   FLOW DEPTH(FEET) =   5.51
  TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =   35.97
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4307.96   34.15    1.608  0.30( 0.24) 0.82    3511.6   13210.00
      2     4321.58   34.55    1.597  0.30( 0.24) 0.82    3549.7   13200.00
      3     4325.21   35.97    1.560  0.30( 0.24) 0.82    3653.6   13100.00
      4     4132.92   60.65    1.180  0.30( 0.24) 0.81    4904.7   13000.00
      5     4082.96   62.88    1.165  0.30( 0.24) 0.81    4924.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    4325.21  Tc(MIN.) =   35.97
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    3653.61

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE = 15.1
----------------------------------------------------------------------------
```



```
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610301X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       72.94   12.28  0.30( 0.30) 1.00      29.3   30100.00
      2       62.67   14.93  0.30( 0.30) 1.00      29.7   30110.00
    TOTAL AREA(ACRES) =       29.7

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4307.96   34.15    1.608  0.30( 0.24) 0.82    3511.6   13210.00
      2     4321.58   34.55    1.597  0.30( 0.24) 0.82    3549.7   13200.00
      3     4325.21   35.97    1.560  0.30( 0.24) 0.82    3653.6   13100.00
      4     4132.92   60.65    1.180  0.30( 0.24) 0.81    4904.7   13000.00
      5     4082.96   62.88    1.165  0.30( 0.24) 0.81    4924.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       72.94   12.28    3.067  0.30( 0.30) 1.00      29.3   30100.00
      2       62.67   14.93    2.647  0.30( 0.30) 1.00      29.7   30110.00
  LONGEST FLOWPATH FROM NODE  30110.00 TO NODE  13223.00 =    2058.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3281.01   12.28    3.067  0.30( 0.25) 0.82    1292.1   30100.00
      2     3380.86   14.93    2.647  0.30( 0.25) 0.82    1564.7   30110.00
      3     4342.89   34.15    1.608  0.30( 0.25) 0.82    3541.3   13210.00
      4     4356.22   34.55    1.597  0.30( 0.25) 0.82    3579.4   13200.00
      5     4358.86   35.97    1.560  0.30( 0.24) 0.82    3683.3   13100.00
      6     4156.42   60.65    1.180  0.30( 0.24) 0.81    4934.4   13000.00
      7     4106.05   62.88    1.165  0.30( 0.24) 0.81    4954.1   13010.00
    TOTAL AREA(ACRES) =      4954.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4358.86  Tc(MIN.) =   35.972
  EFFECTIVE AREA(ACRES) =   3683.29  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4954.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13224.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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```
  ELEVATION DATA: UPSTREAM(FEET) =    416.40  DOWNSTREAM(FEET) =    410.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   408.51   CHANNEL SLOPE =  0.0142
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.55
  CHANNEL FLOW THRU SUBAREA(CFS) =    4358.86
  FLOW VELOCITY(FEET/SEC.) =  11.79   FLOW DEPTH(FEET) =   5.55
  TRAVEL TIME(MIN.) =   0.58   Tc(MIN.) =   36.55
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3281.01   12.91    2.967  0.30( 0.25) 0.82    1292.1   30100.00
      2     3380.86   15.55    2.587  0.30( 0.25) 0.82    1564.7   30110.00
      3     4342.89   34.73    1.593  0.30( 0.25) 0.82    3541.3   13210.00
      4     4356.22   35.12    1.582  0.30( 0.25) 0.82    3579.4   13200.00
      5     4358.86   36.55    1.545  0.30( 0.24) 0.82    3683.3   13100.00
      6     4156.42   61.23    1.176  0.30( 0.24) 0.81    4934.4   13000.00
      7     4106.05   63.47    1.161  0.30( 0.24) 0.81    4954.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    4358.86  Tc(MIN.) =   36.55
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    3683.29

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610302X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       32.92   10.37  0.30( 0.30) 1.00      11.9   30210.00
      2       32.69   10.69  0.30( 0.30) 1.00      12.0   30200.00
    TOTAL AREA(ACRES) =       12.0

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3281.01   12.91    2.967  0.30( 0.25) 0.82    1292.1   30100.00
      2     3380.86   15.55    2.587  0.30( 0.25) 0.82    1564.7   30110.00
      3     4342.89   34.73    1.593  0.30( 0.25) 0.82    3541.3   13210.00
      4     4356.22   35.12    1.582  0.30( 0.25) 0.82    3579.4   13200.00
      5     4358.86   36.55    1.545  0.30( 0.24) 0.82    3683.3   13100.00
```



```
      6     4156.42   61.23    1.176  0.30( 0.24) 0.81    4934.4   13000.00
      7     4106.05   63.47    1.161  0.30( 0.24) 0.81    4954.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       32.92   10.37    3.372  0.30( 0.30) 1.00      11.9   30210.00
      2       32.69   10.69    3.320  0.30( 0.30) 1.00      12.0   30200.00
  LONGEST FLOWPATH FROM NODE  30200.00 TO NODE  13224.00 =    1209.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3059.06   10.37    3.372  0.30( 0.25) 0.82    1049.4   30210.00
      2     3102.20   10.69    3.320  0.30( 0.25) 0.82    1082.1   30200.00
      3     3309.89   12.91    2.967  0.30( 0.25) 0.82    1304.1   30100.00
      4     3405.62   15.55    2.587  0.30( 0.25) 0.82    1576.7   30110.00
      5     4356.88   34.73    1.593  0.30( 0.25) 0.82    3553.3   13210.00
      6     4370.10   35.12    1.582  0.30( 0.25) 0.82    3591.4   13200.00
      7     4372.34   36.55    1.545  0.30( 0.25) 0.82    3695.3   13100.00
      8     4165.91   61.23    1.176  0.30( 0.24) 0.81    4946.4   13000.00
      9     4115.37   63.47    1.161  0.30( 0.24) 0.81    4966.1   13010.00
    TOTAL AREA(ACRES) =      4966.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4372.34  Tc(MIN.) =   36.550
  EFFECTIVE AREA(ACRES) =   3695.32  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4966.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13224.00 TO NODE  13301.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    410.60  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.70   CHANNEL SLOPE =  0.0227
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.90
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.505
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.66      0.30     0.998     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4405.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.89
  AVERAGE FLOW DEPTH(FEET) =   4.90   TRAVEL TIME(MIN.) =   1.51
  Tc(MIN.) =   38.06
  SUBAREA AREA(ACRES) =    61.66       SUBAREA RUNOFF(CFS) =   66.91
  EFFECTIVE AREA(ACRES) =   3756.98     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     5027.8         PEAK FLOW RATE(CFS) =    4372.34
```

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.88 FLOW VELOCITY(FEET/SEC.) = 13.87
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3059.06	12.05	3.104	0.30(0.25)	0.83	1111.1	30210.00
2	3102.20	12.37	3.053	0.30(0.25)	0.83	1143.8	30200.00
3	3309.89	14.56	2.705	0.30(0.25)	0.83	1365.7	30100.00
4	3405.62	17.18	2.447	0.30(0.25)	0.83	1638.3	30110.00
5	4356.88	36.24	1.553	0.30(0.25)	0.82	3615.0	13210.00
6	4370.10	36.64	1.542	0.30(0.25)	0.82	3653.1	13200.00
7	4372.34	38.06	1.505	0.30(0.25)	0.82	3757.0	13100.00
8	4165.91	62.77	1.166	0.30(0.24)	0.82	5008.1	13000.00
9	4115.37	65.01	1.150	0.30(0.24)	0.82	5027.8	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 4372.34 Tc(MIN.) = 38.06
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 3756.98

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610303X.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	282.37	20.28	0.30(0.30)	1.00	166.2	30300.00

TOTAL AREA(ACRES) = 166.2

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3059.06	12.05	3.104	0.30(0.25)	0.83	1111.1	30210.00
2	3102.20	12.37	3.053	0.30(0.25)	0.83	1143.8	30200.00
3	3309.89	14.56	2.705	0.30(0.25)	0.83	1365.7	30100.00
4	3405.62	17.18	2.447	0.30(0.25)	0.83	1638.3	30110.00
5	4356.88	36.24	1.553	0.30(0.25)	0.82	3615.0	13210.00
6	4370.10	36.64	1.542	0.30(0.25)	0.82	3653.1	13200.00
7	4372.34	38.06	1.505	0.30(0.25)	0.82	3757.0	13100.00
8	4165.91	62.77	1.166	0.30(0.24)	0.82	5008.1	13000.00
9	4115.37	65.01	1.150	0.30(0.24)	0.82	5027.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	282.37	20.28	2.188	0.30(0.30)	1.00	166.2	30300.00

LONGEST FLOWPATH FROM NODE 30300.00 TO NODE 13301.00 = 6391.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3308.25	12.05	3.104	0.30(0.25)	0.85	1209.8	30210.00
2	3353.35	12.37	3.053	0.30(0.25)	0.84	1245.2	30200.00
3	3568.10	14.56	2.705	0.30(0.25)	0.84	1485.0	30100.00
4	3677.68	17.18	2.447	0.30(0.25)	0.84	1779.2	30110.00
5	3842.70	20.28	2.188	0.30(0.25)	0.84	2126.1	30300.00
6	4544.29	36.24	1.553	0.30(0.25)	0.83	3781.2	13210.00
7	4555.97	36.64	1.542	0.30(0.25)	0.83	3819.3	13200.00
8	4552.60	38.06	1.505	0.30(0.25)	0.83	3923.2	13100.00
9	4295.40	62.77	1.166	0.30(0.25)	0.82	5174.3	13000.00
10	4242.60	65.01	1.150	0.30(0.25)	0.82	5194.0	13010.00

TOTAL AREA(ACRES) = 5194.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4555.97 Tc(MIN.) = 36.636
EFFECTIVE AREA(ACRES) = 3819.31 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5194.0
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 382.00 DOWNSTREAM(FEET) = 375.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1141.09 CHANNEL SLOPE = 0.0061
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.15
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.487
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.42	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4561.00
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.92
AVERAGE FLOW DEPTH(FEET) = 7.15 TRAVEL TIME(MIN.) = 2.13
Tc(MIN.) = 38.77
SUBAREA AREA(ACRES) = 9.42 SUBAREA RUNOFF(CFS) = 10.06
EFFECTIVE AREA(ACRES) = 3828.73 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5203.4 PEAK FLOW RATE(CFS) = 4555.97
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.15 FLOW VELOCITY(FEET/SEC.) = 8.92
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3308.25	14.40	2.731	0.30(0.25)	0.85	1219.2	30210.00
2	3353.35	14.71	2.681	0.30(0.25)	0.85	1254.6	30200.00
3	3568.10	16.85	2.476	0.30(0.25)	0.84	1494.4	30100.00
4	3677.68	19.46	2.251	0.30(0.25)	0.84	1788.6	30110.00
5	3842.70	22.53	2.055	0.30(0.25)	0.84	2135.5	30300.00
6	4544.29	38.38	1.497	0.30(0.25)	0.83	3790.6	13210.00
7	4555.97	38.77	1.487	0.30(0.25)	0.83	3828.7	13200.00
8	4552.60	40.19	1.451	0.30(0.25)	0.83	3932.6	13100.00
9	4295.40	64.94	1.151	0.30(0.25)	0.82	5183.7	13000.00
10	4242.60	67.19	1.136	0.30(0.25)	0.82	5203.4	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 4555.97 Tc(MIN.) = 38.77
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 3828.73

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610214X.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	344.94	23.74	0.30(0.30)	1.00	227.7	21400.00

TOTAL AREA(ACRES) = 227.7

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3308.25	14.40	2.731	0.30(0.25)	0.85	1219.2	30210.00
2	3353.35	14.71	2.681	0.30(0.25)	0.85	1254.6	30200.00
3	3568.10	16.85	2.476	0.30(0.25)	0.84	1494.4	30100.00
4	3677.68	19.46	2.251	0.30(0.25)	0.84	1788.6	30110.00
5	3842.70	22.53	2.055	0.30(0.25)	0.84	2135.5	30300.00
6	4544.29	38.38	1.497	0.30(0.25)	0.83	3790.6	13210.00
7	4555.97	38.77	1.487	0.30(0.25)	0.83	3828.7	13200.00
8	4552.60	40.19	1.451	0.30(0.25)	0.83	3932.6	13100.00

9	4295.40	64.94	1.151	0.30(0.25)	0.82	5183.7	13000.00
10	4242.60	67.19	1.136	0.30(0.25)	0.82	5203.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	344.94	23.74	1.983	0.30(0.30)	1.00	227.7	21400.00

LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 13302.00 = 6708.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3610.31	14.40	2.731	0.30(0.26)	0.86	1357.3	30210.00
2	3655.66	14.71	2.681	0.30(0.26)	0.86	1395.6	30200.00
3	3884.53	16.85	2.476	0.30(0.26)	0.86	1656.0	30100.00
4	4005.37	19.46	2.251	0.30(0.26)	0.86	1975.2	30110.00
5	4183.96	22.53	2.055	0.30(0.26)	0.85	2351.5	30300.00
6	4241.28	23.74	1.983	0.30(0.26)	0.85	2489.7	21400.00
7	4789.54	38.38	1.497	0.30(0.25)	0.84	4018.3	13210.00
8	4799.12	38.77	1.487	0.30(0.25)	0.84	4056.4	13200.00
9	4788.49	40.19	1.451	0.30(0.25)	0.84	4160.3	13100.00
10	4469.79	64.94	1.151	0.30(0.25)	0.83	5411.3	13000.00
11	4413.88	67.19	1.136	0.30(0.25)	0.83	5431.1	13010.00

TOTAL AREA(ACRES) = 5431.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4799.12 Tc(MIN.) = 38.767
EFFECTIVE AREA(ACRES) = 4056.38 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 5431.1
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13303.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 375.00 DOWNSTREAM(FEET) = 355.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2193.96 CHANNEL SLOPE = 0.0091
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.60
CHANNEL FLOW THRU SUBAREA(CFS) = 4799.12
FLOW VELOCITY(FEET/SEC.) = 10.41 FLOW DEPTH(FEET) = 6.60
TRAVEL TIME(MIN.) = 3.51 Tc(MIN.) = 42.28
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3610.31	18.23	2.357	0.30(0.26)	0.86	1357.3	30210.00
2	3655.66	18.52	2.332	0.30(0.26)	0.86	1395.6	30200.00
3	3884.53	20.60	2.169	0.30(0.26)	0.86	1656.0	30100.00
4	4005.37	23.17	2.017	0.30(0.26)	0.86	1975.2	30110.00
5	4183.96	26.19	1.863	0.30(0.26)	0.85	2351.5	30300.00
6	4241.28	27.39	1.817	0.30(0.26)	0.85	2489.7	21400.00

```
      7     4789.54   41.89    1.424  0.30( 0.25) 0.84    4018.3   13210.00
      8     4799.12   42.28    1.417  0.30( 0.25) 0.84    4056.4   13200.00
      9     4788.49   43.71    1.394  0.30( 0.25) 0.84    4160.3   13100.00
     10     4469.79   68.53    1.127  0.30( 0.25) 0.83    5411.3   13000.00
     11     4413.88   70.80    1.111  0.30( 0.25) 0.83    5431.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    4799.12  Tc(MIN.) =   42.28
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =    4056.38

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610213X.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      203.30   15.41  0.30( 0.30) 1.00      98.2   21300.00
    TOTAL AREA(ACRES) =       98.2

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3610.31   18.23    2.357  0.30( 0.26) 0.86    1357.3   30210.00
      2     3655.66   18.52    2.332  0.30( 0.26) 0.86    1395.6   30200.00
      3     3884.53   20.60    2.169  0.30( 0.26) 0.86    1656.0   30100.00
      4     4005.37   23.17    2.017  0.30( 0.26) 0.86    1975.2   30110.00
      5     4183.96   26.19    1.863  0.30( 0.26) 0.85    2351.5   30300.00
      6     4241.28   27.39    1.817  0.30( 0.26) 0.85    2489.7   21400.00
      7     4789.54   41.89    1.424  0.30( 0.25) 0.84    4018.3   13210.00
      8     4799.12   42.28    1.417  0.30( 0.25) 0.84    4056.4   13200.00
      9     4788.49   43.71    1.394  0.30( 0.25) 0.84    4160.3   13100.00
     10     4469.79   68.53    1.127  0.30( 0.25) 0.83    5411.3   13000.00
     11     4413.88   70.80    1.111  0.30( 0.25) 0.83    5431.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      203.30   15.41    2.600  0.30( 0.30) 1.00      98.2   21300.00
  LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  13303.00 =    2988.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3607.90   15.41    2.600  0.30( 0.26) 0.87    1245.3   21300.00
      2     3792.12   18.23    2.357  0.30( 0.26) 0.87    1455.5   30210.00
      3     3835.23   18.52    2.332  0.30( 0.26) 0.87    1493.8   30200.00
      4     4049.74   20.60    2.169  0.30( 0.26) 0.87    1754.3   30100.00
      5     4157.15   23.17    2.017  0.30( 0.26) 0.86    2073.4   30110.00
      6     4322.13   26.19    1.863  0.30( 0.26) 0.86    2449.7   30300.00
      7     4375.38   27.39    1.817  0.30( 0.26) 0.86    2587.9   21400.00
      8     4888.87   41.89    1.424  0.30( 0.25) 0.84    4116.5   13210.00
      9     4897.88   42.28    1.417  0.30( 0.25) 0.84    4154.6   13200.00
     10     4885.21   43.71    1.394  0.30( 0.25) 0.84    4258.5   13100.00
     11     4542.87   68.53    1.127  0.30( 0.25) 0.83    5509.6   13000.00
     12     4485.60   70.80    1.111  0.30( 0.25) 0.83    5529.3   13010.00
    TOTAL AREA(ACRES) =      5529.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4897.88  Tc(MIN.) =   42.280
  EFFECTIVE AREA(ACRES) =   4154.60  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5529.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13304.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    355.00  DOWNSTREAM(FEET) =    350.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.40   CHANNEL SLOPE =  0.0054
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.70
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.389
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4904.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.71
  AVERAGE FLOW DEPTH(FEET) =   7.70   TRAVEL TIME(MIN.) =   1.77
  Tc(MIN.) =   44.05
  SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =   13.56
  EFFECTIVE AREA(ACRES) =   4168.44     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     5543.1          PEAK FLOW RATE(CFS) =    4897.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.69   FLOW VELOCITY(FEET/SEC.) =   8.71
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3607.90	17.34	2.433	0.30(0.26)	0.87	1259.1	21300.00
2	3792.12	20.14	2.196	0.30(0.26)	0.87	1469.4	30210.00
3	3835.23	20.43	2.179	0.30(0.26)	0.87	1507.7	30200.00
4	4049.74	22.47	2.058	0.30(0.26)	0.87	1768.1	30100.00
5	4157.15	25.03	1.908	0.30(0.26)	0.86	2087.2	30110.00
6	4322.13	28.03	1.792	0.30(0.26)	0.86	2463.6	30300.00
7	4375.38	29.22	1.747	0.30(0.26)	0.86	2601.7	21400.00
8	4888.87	43.66	1.395	0.30(0.25)	0.84	4130.3	13210.00
9	4897.88	44.05	1.389	0.30(0.25)	0.84	4168.4	13200.00
10	4885.21	45.48	1.366	0.30(0.25)	0.84	4272.3	13100.00
11	4542.87	70.34	1.115	0.30(0.25)	0.83	5523.4	13000.00
12	4485.60	72.61	1.099	0.30(0.25)	0.83	5543.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 4897.88 Tc(MIN.) = 44.05
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 4168.44

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610304X.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	303.87	18.31	0.30(0.30)	1.00	164.7	30410.00
2	283.49	23.05	0.30(0.30)	1.00	182.7	30400.00

TOTAL AREA(ACRES) = 182.7

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3607.90	17.34	2.433	0.30(0.26)	0.87	1259.1	21300.00
2	3792.12	20.14	2.196	0.30(0.26)	0.87	1469.4	30210.00
3	3835.23	20.43	2.179	0.30(0.26)	0.87	1507.7	30200.00
4	4049.74	22.47	2.058	0.30(0.26)	0.87	1768.1	30100.00
5	4157.15	25.03	1.908	0.30(0.26)	0.86	2087.2	30110.00
6	4322.13	28.03	1.792	0.30(0.26)	0.86	2463.6	30300.00
7	4375.38	29.22	1.747	0.30(0.26)	0.86	2601.7	21400.00
8	4888.87	43.66	1.395	0.30(0.25)	0.84	4130.3	13210.00
9	4897.88	44.05	1.389	0.30(0.25)	0.84	4168.4	13200.00
10	4885.21	45.48	1.366	0.30(0.25)	0.84	4272.3	13100.00
11	4542.87	70.34	1.115	0.30(0.25)	0.83	5523.4	13000.00

12	4485.60	72.61	1.099	0.30(0.25)	0.83	5543.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	303.87	18.31	2.350	0.30(0.30)	1.00	164.7	30410.00
2	283.49	23.05	2.024	0.30(0.30)	1.00	182.7	30400.00

LONGEST FLOWPATH FROM NODE 30400.00 TO NODE 13304.00 = 5899.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3907.41	17.34	2.433	0.30(0.27)	0.89	1415.2	21300.00
2	3975.57	18.31	2.350	0.30(0.27)	0.89	1496.7	30410.00
3	4088.13	20.14	2.196	0.30(0.27)	0.89	1641.0	30210.00
4	4130.01	20.43	2.179	0.30(0.27)	0.89	1680.4	30200.00
5	4335.73	22.47	2.058	0.30(0.26)	0.88	1948.6	30100.00
6	4357.65	23.05	2.024	0.30(0.26)	0.88	2023.4	30400.00
7	4421.52	25.03	1.908	0.30(0.26)	0.88	2270.0	30110.00
8	4567.53	28.03	1.792	0.30(0.26)	0.87	2646.3	30300.00
9	4613.26	29.22	1.747	0.30(0.26)	0.87	2784.4	21400.00
10	5068.92	43.66	1.395	0.30(0.25)	0.85	4313.0	13210.00
11	5076.89	44.05	1.389	0.30(0.25)	0.85	4351.2	13200.00
12	5060.41	45.48	1.366	0.30(0.25)	0.85	4455.0	13100.00
13	4676.81	70.34	1.115	0.30(0.25)	0.84	5706.1	13000.00
14	4617.02	72.61	1.099	0.30(0.25)	0.84	5725.8	13010.00

TOTAL AREA(ACRES) = 5725.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5076.89 Tc(MIN.) = 44.051
EFFECTIVE AREA(ACRES) = 4351.15 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87
TOTAL AREA(ACRES) = 5725.8
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13305.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 350.00 DOWNSTREAM(FEET) = 315.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.27 CHANNEL SLOPE = 0.0118
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.36
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.320
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5089.46
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.59
AVERAGE FLOW DEPTH(FEET) = 6.36 TRAVEL TIME(MIN.) = 4.27
Tc(MIN.) = 48.32

SUBAREA AREA(ACRES) = 27.39 SUBAREA RUNOFF(CFS) = 25.14
EFFECTIVE AREA(ACRES) = 4378.54 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 5753.2 PEAK FLOW RATE(CFS) = 5076.89
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.35 FLOW VELOCITY(FEET/SEC.) = 11.58
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3907.41	21.96	2.089	0.30(0.27)	0.89	1442.5	21300.00
2	3975.57	22.90	2.033	0.30(0.27)	0.89	1524.1	30410.00
3	4088.13	24.69	1.927	0.30(0.27)	0.89	1668.4	30210.00
4	4130.01	24.96	1.911	0.30(0.27)	0.89	1707.8	30200.00
5	4335.73	26.94	1.834	0.30(0.26)	0.88	1976.0	30100.00
6	4357.65	27.52	1.812	0.30(0.26)	0.88	2050.7	30400.00
7	4421.52	29.48	1.737	0.30(0.26)	0.88	2297.3	30110.00
8	4567.53	32.43	1.653	0.30(0.26)	0.87	2673.7	30300.00
9	4613.26	33.61	1.622	0.30(0.26)	0.87	2811.8	21400.00
10	5068.92	47.93	1.326	0.30(0.26)	0.85	4340.4	13210.00
11	5076.89	48.32	1.320	0.30(0.26)	0.85	4378.5	13200.00
12	5060.41	49.75	1.296	0.30(0.25)	0.85	4482.4	13100.00
13	4676.81	74.71	1.085	0.30(0.25)	0.84	5733.5	13000.00
14	4617.02	77.00	1.070	0.30(0.25)	0.84	5753.2	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 5076.89 Tc(MIN.) = 48.32
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.85 EFFECTIVE AREA(ACRES) = 4378.54

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610305X.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	868.29	22.05	0.30(0.30)	1.00	541.0	30520.00
2	864.45	23.46	0.30(0.30)	1.00	565.1	30540.00
3	839.73	24.82	0.30(0.30)	1.00	576.1	30510.00
4	818.41	26.26	0.30(0.30)	1.00	582.8	30500.00
TOTAL AREA(ACRES) =		582.8				

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3907.41	21.96	2.089	0.30(0.27)	0.89	1442.5	21300.00
2	3975.57	22.90	2.033	0.30(0.27)	0.89	1524.1	30410.00
3	4088.13	24.69	1.927	0.30(0.27)	0.89	1668.4	30210.00
4	4130.01	24.96	1.911	0.30(0.27)	0.89	1707.8	30200.00
5	4335.73	26.94	1.834	0.30(0.26)	0.88	1976.0	30100.00
6	4357.65	27.52	1.812	0.30(0.26)	0.88	2050.7	30400.00
7	4421.52	29.48	1.737	0.30(0.26)	0.88	2297.3	30110.00
8	4567.53	32.43	1.653	0.30(0.26)	0.87	2673.7	30300.00
9	4613.26	33.61	1.622	0.30(0.26)	0.87	2811.8	21400.00
10	5068.92	47.93	1.326	0.30(0.26)	0.85	4340.4	13210.00
11	5076.89	48.32	1.320	0.30(0.26)	0.85	4378.5	13200.00
12	5060.41	49.75	1.296	0.30(0.25)	0.85	4482.4	13100.00
13	4676.81	74.71	1.085	0.30(0.25)	0.84	5733.5	13000.00
14	4617.02	77.00	1.070	0.30(0.25)	0.84	5753.2	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	868.29	22.05	2.083	0.30(0.30)	1.00	541.0	30520.00
2	864.45	23.46	2.000	0.30(0.30)	1.00	565.1	30540.00
3	839.73	24.82	1.920	0.30(0.30)	1.00	576.1	30510.00
4	818.41	26.26	1.860	0.30(0.30)	1.00	582.8	30500.00

LONGEST FLOWPATH FROM NODE 30500.00 TO NODE 13305.00 = 9458.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4774.75	21.96	2.089	0.30(0.28)	0.92	1981.4	21300.00
2	4782.11	22.05	2.083	0.30(0.28)	0.92	1991.2	30520.00
3	4841.54	22.90	2.033	0.30(0.28)	0.92	2079.7	30410.00
4	4875.04	23.46	2.000	0.30(0.28)	0.92	2134.0	30540.00
5	4930.16	24.69	1.927	0.30(0.27)	0.92	2243.5	30210.00
6	4947.27	24.82	1.920	0.30(0.27)	0.92	2262.8	30510.00
7	4967.58	24.96	1.911	0.30(0.27)	0.92	2284.6	30200.00
8	5083.74	26.26	1.860	0.30(0.27)	0.91	2467.1	30500.00
9	5140.50	26.94	1.834	0.30(0.27)	0.91	2558.8	30100.00
10	5150.72	27.52	1.812	0.30(0.27)	0.91	2633.6	30400.00
11	5175.12	29.48	1.737	0.30(0.27)	0.90	2880.2	30110.00
12	5277.17	32.43	1.653	0.30(0.27)	0.90	3256.5	30300.00
13	5306.67	33.61	1.622	0.30(0.27)	0.89	3394.7	21400.00
14	5607.04	47.93	1.326	0.30(0.26)	0.87	4923.3	13210.00
15	5611.72	48.32	1.320	0.30(0.26)	0.87	4961.4	13200.00
16	5583.07	49.75	1.296	0.30(0.26)	0.87	5065.3	13100.00
17	5088.60	74.71	1.085	0.30(0.26)	0.85	6316.3	13000.00
18	5020.70	77.00	1.070	0.30(0.26)	0.85	6336.1	13010.00
TOTAL AREA(ACRES) =		6336.1					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5611.72 Tc(MIN.) = 48.317
EFFECTIVE AREA(ACRES) = 4961.38 AREA-AVERAGED Fm(INCH/HR) = 0.26

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90
TOTAL AREA(ACRES) = 6336.1
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.20 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 315.00 DOWNSTREAM(FEET) = 284.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1317.91 CHANNEL SLOPE = 0.0235
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.55
CHANNEL FLOW THRU SUBAREA(CFS) = 5611.72
FLOW VELOCITY(FEET/SEC.) = 15.17 FLOW DEPTH(FEET) = 5.55
TRAVEL TIME(MIN.) = 1.45 Tc(MIN.) = 49.76
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4774.75	23.48	1.999	0.30(0.28)	0.92	1981.4	21300.00
2	4782.11	23.57	1.993	0.30(0.28)	0.92	1991.2	30520.00
3	4841.54	24.42	1.943	0.30(0.28)	0.92	2079.7	30410.00
4	4875.04	24.97	1.911	0.30(0.28)	0.92	2134.0	30540.00
5	4930.16	26.20	1.863	0.30(0.27)	0.92	2243.5	30210.00
6	4947.27	26.32	1.858	0.30(0.27)	0.92	2262.8	30510.00
7	4967.58	26.47	1.852	0.30(0.27)	0.92	2284.6	30200.00
8	5083.74	27.76	1.803	0.30(0.27)	0.91	2467.1	30500.00
9	5140.50	28.43	1.777	0.30(0.27)	0.91	2558.8	30100.00
10	5150.72	29.01	1.755	0.30(0.27)	0.91	2633.6	30400.00
11	5175.12	30.96	1.691	0.30(0.27)	0.90	2880.2	30110.00
12	5277.17	33.90	1.614	0.30(0.27)	0.90	3256.5	30300.00
13	5306.67	35.08	1.583	0.30(0.27)	0.89	3394.7	21400.00
14	5607.04	49.38	1.302	0.30(0.26)	0.87	4923.3	13210.00
15	5611.72	49.76	1.296	0.30(0.26)	0.87	4961.4	13200.00
16	5583.07	51.20	1.279	0.30(0.26)	0.87	5065.3	13100.00
17	5088.60	76.20	1.075	0.30(0.26)	0.85	6316.3	13000.00
18	5020.70	78.50	1.059	0.30(0.26)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 5611.72 Tc(MIN.) = 49.76
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 4961.38

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: 0610306X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	74.53	18.28	0.30(0.30)	1.00	40.4	30600.00

TOTAL AREA(ACRES) = 40.4

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4774.75	23.48	1.999	0.30(0.28)	0.92	1981.4	21300.00
2	4782.11	23.57	1.993	0.30(0.28)	0.92	1991.2	30520.00
3	4841.54	24.42	1.943	0.30(0.28)	0.92	2079.7	30410.00
4	4875.04	24.97	1.911	0.30(0.28)	0.92	2134.0	30540.00
5	4930.16	26.20	1.863	0.30(0.27)	0.92	2243.5	30210.00
6	4947.27	26.32	1.858	0.30(0.27)	0.92	2262.8	30510.00
7	4967.58	26.47	1.852	0.30(0.27)	0.92	2284.6	30200.00
8	5083.74	27.76	1.803	0.30(0.27)	0.91	2467.1	30500.00
9	5140.50	28.43	1.777	0.30(0.27)	0.91	2558.8	30100.00
10	5150.72	29.01	1.755	0.30(0.27)	0.91	2633.6	30400.00
11	5175.12	30.96	1.691	0.30(0.27)	0.90	2880.2	30110.00
12	5277.17	33.90	1.614	0.30(0.27)	0.90	3256.5	30300.00
13	5306.67	35.08	1.583	0.30(0.27)	0.89	3394.7	21400.00
14	5607.04	49.38	1.302	0.30(0.26)	0.87	4923.3	13210.00
15	5611.72	49.76	1.296	0.30(0.26)	0.87	4961.4	13200.00
16	5583.07	51.20	1.279	0.30(0.26)	0.87	5065.3	13100.00
17	5088.60	76.20	1.075	0.30(0.26)	0.85	6316.3	13000.00
18	5020.70	78.50	1.059	0.30(0.26)	0.85	6336.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	74.53	18.28	2.352	0.30(0.30)	1.00	40.4	30600.00

LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 = 2948.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4555.42	18.28	2.352	0.30(0.28)	0.92	1583.1	30600.00
2	4836.44	23.48	1.999	0.30(0.28)	0.92	2021.7	21300.00
3	4843.61	23.57	1.993	0.30(0.28)	0.92	2031.6	30520.00
4	4901.20	24.42	1.943	0.30(0.28)	0.92	2120.0	30410.00
5	4933.52	24.97	1.911	0.30(0.28)	0.92	2174.4	30540.00
6	4986.91	26.20	1.863	0.30(0.28)	0.92	2283.9	30210.00
7	5003.85	26.32	1.858	0.30(0.28)	0.92	2303.1	30510.00
8	5023.95	26.47	1.852	0.30(0.28)	0.92	2324.9	30200.00
9	5138.31	27.76	1.803	0.30(0.27)	0.91	2507.4	30500.00
10	5194.13	28.43	1.777	0.30(0.27)	0.91	2599.2	30100.00
11	5203.55	29.01	1.755	0.30(0.27)	0.91	2673.9	30400.00
12	5225.64	30.96	1.691	0.30(0.27)	0.90	2920.5	30110.00
13	5324.89	33.90	1.614	0.30(0.27)	0.90	3296.9	30300.00
14	5353.27	35.08	1.583	0.30(0.27)	0.89	3435.0	21400.00

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     15     5643.44   49.38    1.302  0.30( 0.26) 0.87    4963.6   13210.00
     16     5647.89   49.76    1.296  0.30( 0.26) 0.87    5001.7   13200.00
     17     5618.63   51.20    1.279  0.30( 0.26) 0.87    5105.6   13100.00
     18     5116.75   76.20    1.075  0.30( 0.26) 0.86    6356.7   13000.00
     19     5048.28   78.50    1.059  0.30( 0.26) 0.85    6376.4   13010.00
    TOTAL AREA(ACRES) =      6376.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5647.89  Tc(MIN.) =   49.764
  EFFECTIVE AREA(ACRES) =   5001.74  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =     6376.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.20 =   43204.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.20 TO NODE  13305.40 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    284.00  DOWNSTREAM(FEET) =    274.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   826.37   CHANNEL SLOPE =  0.0121
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.68
  CHANNEL FLOW THRU SUBAREA(CFS) =    5647.89
  FLOW VELOCITY(FEET/SEC.) =  12.07   FLOW DEPTH(FEET) =   6.68
  TRAVEL TIME(MIN.) =   1.14   Tc(MIN.) =   50.91
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4555.42   19.50    2.248  0.30( 0.28) 0.92    1583.1   30600.00
      2     4836.44   24.68    1.928  0.30( 0.28) 0.92    2021.7   21300.00
      3     4843.61   24.76    1.923  0.30( 0.28) 0.92    2031.6   30520.00
      4     4901.20   25.61    1.885  0.30( 0.28) 0.92    2120.0   30410.00
      5     4933.52   26.16    1.864  0.30( 0.28) 0.92    2174.4   30540.00
      6     4986.91   27.38    1.817  0.30( 0.28) 0.92    2283.9   30210.00
      7     5003.85   27.51    1.812  0.30( 0.28) 0.92    2303.1   30510.00
      8     5023.95   27.65    1.807  0.30( 0.28) 0.92    2324.9   30200.00
      9     5138.31   28.93    1.758  0.30( 0.27) 0.91    2507.4   30500.00
     10     5194.13   29.60    1.732  0.30( 0.27) 0.91    2599.2   30100.00
     11     5203.55   30.18    1.712  0.30( 0.27) 0.91    2673.9   30400.00
     12     5225.64   32.13    1.661  0.30( 0.27) 0.90    2920.5   30110.00
     13     5324.89   35.06    1.584  0.30( 0.27) 0.90    3296.9   30300.00
     14     5353.27   36.24    1.553  0.30( 0.27) 0.89    3435.0   21400.00
     15     5643.44   50.52    1.287  0.30( 0.26) 0.87    4963.6   13210.00
     16     5647.89   50.91    1.283  0.30( 0.26) 0.87    5001.7   13200.00
     17     5618.63   52.34    1.267  0.30( 0.26) 0.87    5105.6   13100.00
     18     5116.75   77.38    1.067  0.30( 0.26) 0.86    6356.7   13000.00
     19     5048.28   79.68    1.051  0.30( 0.26) 0.85    6376.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5647.89  Tc(MIN.) =   50.91
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    5001.74

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  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610307X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      185.62   17.68  0.30( 0.30) 1.00      98.0   30700.00
    TOTAL AREA(ACRES) =       98.0

****************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4555.42   19.50    2.248  0.30( 0.28) 0.92    1583.1   30600.00
      2     4836.44   24.68    1.928  0.30( 0.28) 0.92    2021.7   21300.00
      3     4843.61   24.76    1.923  0.30( 0.28) 0.92    2031.6   30520.00
      4     4901.20   25.61    1.885  0.30( 0.28) 0.92    2120.0   30410.00
      5     4933.52   26.16    1.864  0.30( 0.28) 0.92    2174.4   30540.00
      6     4986.91   27.38    1.817  0.30( 0.28) 0.92    2283.9   30210.00
      7     5003.85   27.51    1.812  0.30( 0.28) 0.92    2303.1   30510.00
      8     5023.95   27.65    1.807  0.30( 0.28) 0.92    2324.9   30200.00
      9     5138.31   28.93    1.758  0.30( 0.27) 0.91    2507.4   30500.00
     10     5194.13   29.60    1.732  0.30( 0.27) 0.91    2599.2   30100.00
     11     5203.55   30.18    1.712  0.30( 0.27) 0.91    2673.9   30400.00
     12     5225.64   32.13    1.661  0.30( 0.27) 0.90    2920.5   30110.00
     13     5324.89   35.06    1.584  0.30( 0.27) 0.90    3296.9   30300.00
     14     5353.27   36.24    1.553  0.30( 0.27) 0.89    3435.0   21400.00
     15     5643.44   50.52    1.287  0.30( 0.26) 0.87    4963.6   13210.00
     16     5647.89   50.91    1.283  0.30( 0.26) 0.87    5001.7   13200.00
     17     5618.63   52.34    1.267  0.30( 0.26) 0.87    5105.6   13100.00
     18     5116.75   77.38    1.067  0.30( 0.26) 0.86    6356.7   13000.00
     19     5048.28   79.68    1.051  0.30( 0.26) 0.85    6376.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      185.62   17.68    2.405  0.30( 0.30) 1.00      98.0   30700.00
  LONGEST FLOWPATH FROM NODE  30700.00 TO NODE  13305.40 =    5192.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4643.92   17.68    2.405  0.30( 0.28) 0.93    1533.0   30700.00
      2     4727.19   19.50    2.248  0.30( 0.28) 0.93    1681.1   30600.00
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      3     4980.02   24.68    1.928  0.30( 0.28) 0.93    2119.7   21300.00
      4     4986.73   24.76    1.923  0.30( 0.28) 0.93    2129.6   30520.00
      5     5041.03   25.61    1.885  0.30( 0.28) 0.92    2218.0   30410.00
      6     5071.48   26.16    1.864  0.30( 0.28) 0.92    2272.4   30540.00
      7     5120.72   27.38    1.817  0.30( 0.28) 0.92    2381.9   30210.00
      8     5137.24   27.51    1.812  0.30( 0.28) 0.92    2401.1   30510.00
      9     5156.86   27.65    1.807  0.30( 0.28) 0.92    2423.0   30200.00
     10     5266.88   28.93    1.758  0.30( 0.27) 0.92    2605.4   30500.00
     11     5320.44   29.60    1.732  0.30( 0.27) 0.91    2697.2   30100.00
     12     5328.07   30.18    1.712  0.30( 0.27) 0.91    2771.9   30400.00
     13     5345.65   32.13    1.661  0.30( 0.27) 0.91    3018.5   30110.00
     14     5438.11   35.06    1.584  0.30( 0.27) 0.90    3394.9   30300.00
     15     5463.77   36.24    1.553  0.30( 0.27) 0.90    3533.0   21400.00
     16     5730.47   50.52    1.287  0.30( 0.26) 0.87    5061.6   13210.00
     17     5734.55   50.91    1.283  0.30( 0.26) 0.87    5099.7   13200.00
     18     5703.92   52.34    1.267  0.30( 0.26) 0.87    5203.6   13100.00
     19     5184.40   77.38    1.067  0.30( 0.26) 0.86    6454.7   13000.00
     20     5114.56   79.68    1.051  0.30( 0.26) 0.86    6474.4   13010.00
   TOTAL AREA(ACRES) =      6474.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5734.55  Tc(MIN.) =   50.905
  EFFECTIVE AREA(ACRES) =   5099.74  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =     6474.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.60 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    274.00  DOWNSTREAM(FEET) =    258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   733.85   CHANNEL SLOPE =  0.0218
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.73
  CHANNEL FLOW THRU SUBAREA(CFS) =    5734.55
  FLOW VELOCITY(FEET/SEC.) =  14.88   FLOW DEPTH(FEET) =   5.73
  TRAVEL TIME(MIN.) =   0.82   Tc(MIN.) =   51.73
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4643.92   18.55    2.329  0.30( 0.28) 0.93    1533.0   30700.00
      2     4727.19   20.37    2.182  0.30( 0.28) 0.93    1681.1   30600.00
      3     4980.02   25.53    1.888  0.30( 0.28) 0.93    2119.7   21300.00
      4     4986.73   25.62    1.885  0.30( 0.28) 0.93    2129.6   30520.00
      5     5041.03   26.47    1.852  0.30( 0.28) 0.92    2218.0   30410.00
      6     5071.48   27.02    1.831  0.30( 0.28) 0.92    2272.4   30540.00
      7     5120.72   28.23    1.784  0.30( 0.28) 0.92    2381.9   30210.00
      8     5137.24   28.36    1.780  0.30( 0.28) 0.92    2401.1   30510.00
      9     5156.86   28.50    1.774  0.30( 0.28) 0.92    2423.0   30200.00
     10     5266.88   29.77    1.725  0.30( 0.27) 0.92    2605.4   30500.00
     11     5320.44   30.44    1.705  0.30( 0.27) 0.91    2697.2   30100.00
     12     5328.07   31.02    1.690  0.30( 0.27) 0.91    2771.9   30400.00
```



```
     13     5345.65   32.97    1.639  0.30( 0.27) 0.91    3018.5   30110.00
     14     5438.11   35.90    1.562  0.30( 0.27) 0.90    3394.9   30300.00
     15     5463.77   37.07    1.531  0.30( 0.27) 0.90    3533.0   21400.00
     16     5730.47   51.34    1.278  0.30( 0.26) 0.87    5061.6   13210.00
     17     5734.55   51.73    1.274  0.30( 0.26) 0.87    5099.7   13200.00
     18     5703.92   53.17    1.258  0.30( 0.26) 0.87    5203.6   13100.00
     19     5184.40   78.23    1.061  0.30( 0.26) 0.86    6454.7   13000.00
     20     5114.56   80.53    1.046  0.30( 0.26) 0.86    6474.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5734.55  Tc(MIN.) =   51.73
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    5099.74

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.60 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.60 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610308X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      125.11   17.21  0.30( 0.30) 1.00      64.8   30800.00
    TOTAL AREA(ACRES) =       64.8

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.60 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4643.92   18.55    2.329  0.30( 0.28) 0.93    1533.0   30700.00
      2     4727.19   20.37    2.182  0.30( 0.28) 0.93    1681.1   30600.00
      3     4980.02   25.53    1.888  0.30( 0.28) 0.93    2119.7   21300.00
      4     4986.73   25.62    1.885  0.30( 0.28) 0.93    2129.6   30520.00
      5     5041.03   26.47    1.852  0.30( 0.28) 0.92    2218.0   30410.00
      6     5071.48   27.02    1.831  0.30( 0.28) 0.92    2272.4   30540.00
      7     5120.72   28.23    1.784  0.30( 0.28) 0.92    2381.9   30210.00
      8     5137.24   28.36    1.780  0.30( 0.28) 0.92    2401.1   30510.00
      9     5156.86   28.50    1.774  0.30( 0.28) 0.92    2423.0   30200.00
     10     5266.88   29.77    1.725  0.30( 0.27) 0.92    2605.4   30500.00
     11     5320.44   30.44    1.705  0.30( 0.27) 0.91    2697.2   30100.00
     12     5328.07   31.02    1.690  0.30( 0.27) 0.91    2771.9   30400.00
     13     5345.65   32.97    1.639  0.30( 0.27) 0.91    3018.5   30110.00
     14     5438.11   35.90    1.562  0.30( 0.27) 0.90    3394.9   30300.00
     15     5463.77   37.07    1.531  0.30( 0.27) 0.90    3533.0   21400.00
     16     5730.47   51.34    1.278  0.30( 0.26) 0.87    5061.6   13210.00
     17     5734.55   51.73    1.274  0.30( 0.26) 0.87    5099.7   13200.00
     18     5703.92   53.17    1.258  0.30( 0.26) 0.87    5203.6   13100.00
```

```
    19     5184.40   78.23    1.061  0.30( 0.26) 0.86    6454.7   13000.00
    20     5114.56   80.53    1.046  0.30( 0.26) 0.86    6474.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      125.11   17.21    2.445  0.30( 0.30) 1.00      64.8   30800.00
  LONGEST FLOWPATH FROM NODE  30800.00 TO NODE  13305.60 =    4165.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4675.88   17.21    2.445  0.30( 0.28) 0.93    1487.0   30800.00
      2     4762.29   18.55    2.329  0.30( 0.28) 0.93    1597.8   30700.00
      3     4837.00   20.37    2.182  0.30( 0.28) 0.93    1745.9   30600.00
      4     5072.68   25.53    1.888  0.30( 0.28) 0.93    2184.5   21300.00
      5     5079.19   25.62    1.885  0.30( 0.28) 0.93    2194.4   30520.00
      6     5131.59   26.47    1.852  0.30( 0.28) 0.93    2282.8   30410.00
      7     5160.82   27.02    1.831  0.30( 0.28) 0.93    2337.2   30540.00
      8     5207.32   28.23    1.784  0.30( 0.28) 0.92    2446.7   30210.00
      9     5223.57   28.36    1.780  0.30( 0.28) 0.92    2466.0   30510.00
     10     5242.87   28.50    1.774  0.30( 0.28) 0.92    2487.8   30200.00
     11     5350.02   29.77    1.725  0.30( 0.28) 0.92    2670.2   30500.00
     12     5402.40   30.44    1.705  0.30( 0.27) 0.92    2762.0   30100.00
     13     5409.16   31.02    1.690  0.30( 0.27) 0.91    2836.8   30400.00
     14     5423.75   32.97    1.639  0.30( 0.27) 0.91    3083.4   30110.00
     15     5511.72   35.90    1.562  0.30( 0.27) 0.90    3459.7   30300.00
     16     5535.58   37.07    1.531  0.30( 0.27) 0.90    3597.8   21400.00
     17     5787.52   51.34    1.278  0.30( 0.26) 0.87    5126.4   13210.00
     18     5791.36   51.73    1.274  0.30( 0.26) 0.87    5164.6   13200.00
     19     5759.82   53.17    1.258  0.30( 0.26) 0.87    5268.4   13100.00
     20     5228.82   78.23    1.061  0.30( 0.26) 0.86    6519.5   13000.00
     21     5158.07   80.53    1.046  0.30( 0.26) 0.86    6539.3   13010.00
    TOTAL AREA(ACRES) =      6539.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5791.36  Tc(MIN.) =   51.727
  EFFECTIVE AREA(ACRES) =   5164.56  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =     6539.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.80 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    254.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.16   CHANNEL SLOPE =  0.0042
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.98
  CHANNEL FLOW THRU SUBAREA(CFS) =    5791.36
  FLOW VELOCITY(FEET/SEC.) =   8.39   FLOW DEPTH(FEET) =   8.98
  TRAVEL TIME(MIN.) =   1.88   Tc(MIN.) =   53.61
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.80 =   45711.71 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4675.88   19.22    2.272  0.30( 0.28) 0.93    1487.0   30800.00
      2     4762.29   20.55    2.172  0.30( 0.28) 0.93    1597.8   30700.00
      3     4837.00   22.36    2.065  0.30( 0.28) 0.93    1745.9   30600.00
      4     5072.68   27.49    1.813  0.30( 0.28) 0.93    2184.5   21300.00
      5     5079.19   27.58    1.810  0.30( 0.28) 0.93    2194.4   30520.00
      6     5131.59   28.42    1.777  0.30( 0.28) 0.93    2282.8   30410.00
      7     5160.82   28.96    1.756  0.30( 0.28) 0.93    2337.2   30540.00
      8     5207.32   30.18    1.712  0.30( 0.28) 0.92    2446.7   30210.00
      9     5223.57   30.30    1.709  0.30( 0.28) 0.92    2466.0   30510.00
     10     5242.87   30.44    1.705  0.30( 0.28) 0.92    2487.8   30200.00
     11     5350.02   31.70    1.672  0.30( 0.28) 0.92    2670.2   30500.00
     12     5402.40   32.36    1.655  0.30( 0.27) 0.92    2762.0   30100.00
     13     5409.16   32.94    1.639  0.30( 0.27) 0.91    2836.8   30400.00
     14     5423.75   34.89    1.588  0.30( 0.27) 0.91    3083.4   30110.00
     15     5511.72   37.81    1.512  0.30( 0.27) 0.90    3459.7   30300.00
     16     5535.58   38.98    1.481  0.30( 0.27) 0.90    3597.8   21400.00
     17     5787.52   53.22    1.258  0.30( 0.26) 0.87    5126.4   13210.00
     18     5791.36   53.61    1.253  0.30( 0.26) 0.87    5164.6   13200.00
     19     5759.82   55.05    1.238  0.30( 0.26) 0.87    5268.4   13100.00
     20     5228.82   80.17    1.048  0.30( 0.26) 0.86    6519.5   13000.00
     21     5158.07   82.48    1.033  0.30( 0.26) 0.86    6539.3   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5791.36  Tc(MIN.) =   53.61
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    5164.56

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610309X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      128.75   16.90  0.30( 0.30) 1.00      65.9   30900.00
      2      128.64   16.93  0.30( 0.30) 1.00      65.9   30910.00
    TOTAL AREA(ACRES) =       65.9

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	4675.88	19.22	2.272	0.30(0.28)	0.93	1487.0	30800.00
2	4762.29	20.55	2.172	0.30(0.28)	0.93	1597.8	30700.00
3	4837.00	22.36	2.065	0.30(0.28)	0.93	1745.9	30600.00
4	5072.68	27.49	1.813	0.30(0.28)	0.93	2184.5	21300.00
5	5079.19	27.58	1.810	0.30(0.28)	0.93	2194.4	30520.00
6	5131.59	28.42	1.777	0.30(0.28)	0.93	2282.8	30410.00
7	5160.82	28.96	1.756	0.30(0.28)	0.93	2337.2	30540.00
8	5207.32	30.18	1.712	0.30(0.28)	0.92	2446.7	30210.00
9	5223.57	30.30	1.709	0.30(0.28)	0.92	2466.0	30510.00
10	5242.87	30.44	1.705	0.30(0.28)	0.92	2487.8	30200.00
11	5350.02	31.70	1.672	0.30(0.28)	0.92	2670.2	30500.00
12	5402.40	32.36	1.655	0.30(0.27)	0.92	2762.0	30100.00
13	5409.16	32.94	1.639	0.30(0.27)	0.91	2836.8	30400.00
14	5423.75	34.89	1.588	0.30(0.27)	0.91	3083.4	30110.00
15	5511.72	37.81	1.512	0.30(0.27)	0.90	3459.7	30300.00
16	5535.58	38.98	1.481	0.30(0.27)	0.90	3597.8	21400.00
17	5787.52	53.22	1.258	0.30(0.26)	0.87	5126.4	13210.00
18	5791.36	53.61	1.253	0.30(0.26)	0.87	5164.6	13200.00
19	5759.82	55.05	1.238	0.30(0.26)	0.87	5268.4	13100.00
20	5228.82	80.17	1.048	0.30(0.26)	0.86	6519.5	13000.00
21	5158.07	82.48	1.033	0.30(0.26)	0.86	6539.3	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.75	16.90	2.472	0.30(0.30)	1.00	65.9	30900.00
2	128.64	16.93	2.469	0.30(0.30)	1.00	65.9	30910.00

LONGEST FLOWPATH FROM NODE 30900.00 TO NODE 13305.80 = 3403.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4652.25	16.90	2.472	0.30(0.28)	0.93	1373.4	30900.00
2	4655.29	16.93	2.469	0.30(0.28)	0.93	1376.2	30910.00
3	4792.86	19.22	2.272	0.30(0.28)	0.93	1552.9	30800.00
4	4873.35	20.55	2.172	0.30(0.28)	0.93	1663.7	30700.00
5	4941.71	22.36	2.065	0.30(0.28)	0.93	1811.8	30600.00
6	5162.43	27.49	1.813	0.30(0.28)	0.93	2250.5	21300.00
7	5168.74	27.58	1.810	0.30(0.28)	0.93	2260.3	30520.00
8	5219.24	28.42	1.777	0.30(0.28)	0.93	2348.7	30410.00
9	5247.22	28.96	1.756	0.30(0.28)	0.93	2403.1	30540.00
10	5291.08	30.18	1.712	0.30(0.28)	0.93	2512.6	30210.00
11	5307.13	30.30	1.709	0.30(0.28)	0.92	2531.9	30510.00
12	5326.22	30.44	1.705	0.30(0.28)	0.92	2553.7	30200.00
13	5431.40	31.70	1.672	0.30(0.28)	0.92	2736.2	30500.00
14	5482.76	32.36	1.655	0.30(0.28)	0.92	2827.9	30100.00
15	5488.61	32.94	1.639	0.30(0.27)	0.92	2902.7	30400.00
16	5500.17	34.89	1.588	0.30(0.27)	0.91	3149.3	30110.00
17	5583.60	37.81	1.512	0.30(0.27)	0.90	3525.6	30300.00
18	5605.64	38.98	1.481	0.30(0.27)	0.90	3663.8	21400.00
19	5844.32	53.22	1.258	0.30(0.26)	0.88	5192.4	13210.00
20	5847.91	53.61	1.253	0.30(0.26)	0.87	5230.5	13200.00
21	5815.45	55.05	1.238	0.30(0.26)	0.87	5334.4	13100.00
22	5273.20	80.17	1.048	0.30(0.26)	0.86	6585.4	13000.00
23	5201.53	82.48	1.033	0.30(0.26)	0.86	6605.2	13010.00

TOTAL AREA(ACRES) = 6605.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5847.91 Tc(MIN.) = 53.610
EFFECTIVE AREA(ACRES) = 5230.48 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90
TOTAL AREA(ACRES) = 6605.2
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

****
FLOW PROCESS FROM NODE 13305.80 TO NODE 13306.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 254.00 DOWNSTREAM(FEET) = 245.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 583.12 CHANNEL SLOPE = 0.0146
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.50
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.245
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.77	0.30	0.998	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5877.18
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.04
AVERAGE FLOW DEPTH(FEET) = 6.49 TRAVEL TIME(MIN.) = 0.75
Tc(MIN.) = 54.36
SUBAREA AREA(ACRES) = 68.77 SUBAREA RUNOFF(CFS) = 58.55
EFFECTIVE AREA(ACRES) = 5299.25 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88
TOTAL AREA(ACRES) = 6673.9 PEAK FLOW RATE(CFS) = 5847.91
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.47 FLOW VELOCITY(FEET/SEC.) = 13.02
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13306.00 = 46294.83 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4652.25	17.69	2.403	0.30(0.28)	0.94	1442.2	30900.00
2	4655.29	17.73	2.400	0.30(0.28)	0.94	1444.9	30910.00
3	4792.86	20.01	2.204	0.30(0.28)	0.94	1621.6	30800.00
4	4873.35	21.33	2.126	0.30(0.28)	0.94	1732.5	30700.00
5	4941.71	23.14	2.019	0.30(0.28)	0.93	1880.6	30600.00
6	5162.43	28.27	1.783	0.30(0.28)	0.93	2319.2	21300.00
7	5168.74	28.35	1.780	0.30(0.28)	0.93	2329.1	30520.00
8	5219.24	29.19	1.748	0.30(0.28)	0.93	2417.5	30410.00
9	5247.22	29.73	1.727	0.30(0.28)	0.93	2471.9	30540.00
10	5291.08	30.94	1.692	0.30(0.28)	0.93	2581.4	30210.00
11	5307.13	31.06	1.689	0.30(0.28)	0.93	2600.7	30510.00
12	5326.22	31.20	1.685	0.30(0.28)	0.93	2622.5	30200.00
13	5431.40	32.46	1.652	0.30(0.28)	0.92	2804.9	30500.00

14	5482.76	33.12	1.635	0.30(0.28)	0.92	2896.7	30100.00
15	5488.61	33.70	1.620	0.30(0.28)	0.92	2971.4	30400.00
16	5500.17	35.65	1.568	0.30(0.27)	0.91	3218.1	30110.00
17	5583.60	38.57	1.492	0.30(0.27)	0.91	3594.4	30300.00
18	5605.64	39.74	1.461	0.30(0.27)	0.90	3732.5	21400.00
19	5844.32	53.97	1.249	0.30(0.26)	0.88	5261.1	13210.00
20	5847.91	54.36	1.245	0.30(0.26)	0.88	5299.2	13200.00
21	5815.45	55.80	1.230	0.30(0.26)	0.88	5403.1	13100.00
22	5273.20	80.94	1.043	0.30(0.26)	0.86	6654.2	13000.00
23	5201.53	83.25	1.027	0.30(0.26)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 5847.91 Tc(MIN.) = 54.36
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.88 EFFECTIVE AREA(ACRES) = 5299.25

****
FLOW PROCESS FROM NODE 13306.00 TO NODE 13307.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 245.50 DOWNSTREAM(FEET) = 220.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1543.21 CHANNEL SLOPE = 0.0165
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.25
CHANNEL FLOW THRU SUBAREA(CFS) = 5847.91
FLOW VELOCITY(FEET/SEC.) = 13.60 FLOW DEPTH(FEET) = 6.25
TRAVEL TIME(MIN.) = 1.89 Tc(MIN.) = 56.25
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4652.25	19.72	2.228	0.30(0.28)	0.94	1442.2	30900.00
2	4655.29	19.76	2.225	0.30(0.28)	0.94	1444.9	30910.00
3	4792.86	22.02	2.085	0.30(0.28)	0.94	1621.6	30800.00
4	4873.35	23.33	2.007	0.30(0.28)	0.94	1732.5	30700.00
5	4941.71	25.13	1.904	0.30(0.28)	0.93	1880.6	30600.00
6	5162.43	30.23	1.710	0.30(0.28)	0.93	2319.2	21300.00
7	5168.74	30.32	1.708	0.30(0.28)	0.93	2329.1	30520.00
8	5219.24	31.15	1.686	0.30(0.28)	0.93	2417.5	30410.00
9	5247.22	31.69	1.672	0.30(0.28)	0.93	2471.9	30540.00
10	5291.08	32.90	1.641	0.30(0.28)	0.93	2581.4	30210.00
11	5307.13	33.01	1.637	0.30(0.28)	0.93	2600.7	30510.00
12	5326.22	33.15	1.634	0.30(0.28)	0.93	2622.5	30200.00
13	5431.40	34.40	1.601	0.30(0.28)	0.92	2804.9	30500.00
14	5482.76	35.05	1.584	0.30(0.28)	0.92	2896.7	30100.00
15	5488.61	35.62	1.569	0.30(0.28)	0.92	2971.4	30400.00
16	5500.17	37.57	1.518	0.30(0.27)	0.91	3218.1	30110.00
17	5583.60	40.48	1.446	0.30(0.27)	0.91	3594.4	30300.00
18	5605.64	41.65	1.427	0.30(0.27)	0.90	3732.5	21400.00
19	5844.32	55.86	1.229	0.30(0.26)	0.88	5261.1	13210.00
20	5847.91	56.25	1.225	0.30(0.26)	0.88	5299.2	13200.00
21	5815.45	57.69	1.209	0.30(0.26)	0.88	5403.1	13100.00
22	5273.20	82.89	1.030	0.30(0.26)	0.86	6654.2	13000.00
23	5201.53	85.21	1.014	0.30(0.26)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 5847.91 Tc(MIN.) = 56.25
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.88 EFFECTIVE AREA(ACRES) = 5299.25

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610310X.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	161.90	21.14	0.30(0.30)	1.00	97.9	31000.00

TOTAL AREA(ACRES) = 97.9

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4652.25	19.72	2.228	0.30(0.28)	0.94	1442.2	30900.00
2	4655.29	19.76	2.225	0.30(0.28)	0.94	1444.9	30910.00
3	4792.86	22.02	2.085	0.30(0.28)	0.94	1621.6	30800.00
4	4873.35	23.33	2.007	0.30(0.28)	0.94	1732.5	30700.00
5	4941.71	25.13	1.904	0.30(0.28)	0.93	1880.6	30600.00
6	5162.43	30.23	1.710	0.30(0.28)	0.93	2319.2	21300.00
7	5168.74	30.32	1.708	0.30(0.28)	0.93	2329.1	30520.00
8	5219.24	31.15	1.686	0.30(0.28)	0.93	2417.5	30410.00
9	5247.22	31.69	1.672	0.30(0.28)	0.93	2471.9	30540.00
10	5291.08	32.90	1.641	0.30(0.28)	0.93	2581.4	30210.00
11	5307.13	33.01	1.637	0.30(0.28)	0.93	2600.7	30510.00
12	5326.22	33.15	1.634	0.30(0.28)	0.93	2622.5	30200.00
13	5431.40	34.40	1.601	0.30(0.28)	0.92	2804.9	30500.00
14	5482.76	35.05	1.584	0.30(0.28)	0.92	2896.7	30100.00
15	5488.61	35.62	1.569	0.30(0.28)	0.92	2971.4	30400.00
16	5500.17	37.57	1.518	0.30(0.27)	0.91	3218.1	30110.00
17	5583.60	40.48	1.446	0.30(0.27)	0.91	3594.4	30300.00
18	5605.64	41.65	1.427	0.30(0.27)	0.90	3732.5	21400.00
19	5844.32	55.86	1.229	0.30(0.26)	0.88	5261.1	13210.00
20	5847.91	56.25	1.225	0.30(0.26)	0.88	5299.2	13200.00
21	5815.45	57.69	1.209	0.30(0.26)	0.88	5403.1	13100.00
22	5273.20	82.89	1.030	0.30(0.26)	0.86	6654.2	13000.00
23	5201.53	85.21	1.014	0.30(0.26)	0.86	6673.9	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      161.90   21.14    2.137  0.30( 0.30) 1.00      97.9   31000.00
LONGEST FLOWPATH FROM NODE  31000.00 TO NODE  13307.00 =    5162.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     4810.80   19.72    2.228  0.30( 0.28) 0.94    1533.5   30900.00
    2     4813.88   19.76    2.225  0.30( 0.28) 0.94    1536.4   30910.00
    3     4901.31   21.14    2.137  0.30( 0.28) 0.94    1650.9   31000.00
    4     4950.19   22.02    2.085  0.30( 0.28) 0.94    1719.5   30800.00
    5     5023.83   23.33    2.007  0.30( 0.28) 0.94    1830.3   30700.00
    6     5083.06   25.13    1.904  0.30( 0.28) 0.94    1978.5   30600.00
    7     5286.75   30.23    1.710  0.30( 0.28) 0.93    2417.1   21300.00
    8     5292.87   30.32    1.708  0.30( 0.28) 0.93    2427.0   30520.00
    9     5341.44   31.15    1.686  0.30( 0.28) 0.93    2515.4   30410.00
   10     5368.17   31.69    1.672  0.30( 0.28) 0.93    2569.8   30540.00
   11     5409.24   32.90    1.641  0.30( 0.28) 0.93    2679.3   30210.00
   12     5425.02   33.01    1.637  0.30( 0.28) 0.93    2698.5   30510.00
   13     5443.80   33.15    1.634  0.30( 0.28) 0.93    2720.3   30200.00
   14     5546.09   34.40    1.601  0.30( 0.28) 0.92    2902.8   30500.00
   15     5595.94   35.05    1.584  0.30( 0.28) 0.92    2994.6   30100.00
   16     5600.47   35.62    1.569  0.30( 0.28) 0.92    3069.3   30400.00
   17     5607.52   37.57    1.518  0.30( 0.27) 0.91    3315.9   30110.00
   18     5684.66   40.48    1.446  0.30( 0.27) 0.91    3692.3   30300.00
   19     5705.03   41.65    1.427  0.30( 0.27) 0.91    3830.4   21400.00
   20     5926.23   55.86    1.229  0.30( 0.26) 0.88    5359.0   13210.00
   21     5929.45   56.25    1.225  0.30( 0.26) 0.88    5397.1   13200.00
   22     5895.61   57.69    1.209  0.30( 0.26) 0.88    5501.0   13100.00
   23     5337.57   82.89    1.030  0.30( 0.26) 0.86    6752.1   13000.00
   24     5264.51   85.21    1.014  0.30( 0.26) 0.86    6771.8   13010.00
  TOTAL AREA(ACRES) =      6771.8

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     5929.45  Tc(MIN.) =   56.246
 EFFECTIVE AREA(ACRES) =   5397.13  AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
 TOTAL AREA(ACRES) =     6771.8
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    220.00  DOWNSTREAM(FEET) =    212.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.0086
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.51
 CHANNEL FLOW THRU SUBAREA(CFS) =    5929.45
 FLOW VELOCITY(FEET/SEC.) =  10.88   FLOW DEPTH(FEET) =   7.51
 TRAVEL TIME(MIN.) =   1.42   Tc(MIN.) =   57.66
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     4810.80   21.23    2.132  0.30( 0.28) 0.94    1533.5   30900.00
    2     4813.88   21.27    2.130  0.30( 0.28) 0.94    1536.4   30910.00
    3     4901.31   22.64    2.048  0.30( 0.28) 0.94    1650.9   31000.00
    4     4950.19   23.51    1.997  0.30( 0.28) 0.94    1719.5   30800.00
    5     5023.83   24.82    1.919  0.30( 0.28) 0.94    1830.3   30700.00
    6     5083.06   26.62    1.847  0.30( 0.28) 0.94    1978.5   30600.00
    7     5286.75   31.70    1.672  0.30( 0.28) 0.93    2417.1   21300.00
    8     5292.87   31.78    1.670  0.30( 0.28) 0.93    2427.0   30520.00
    9     5341.44   32.61    1.648  0.30( 0.28) 0.93    2515.4   30410.00
   10     5368.17   33.15    1.634  0.30( 0.28) 0.93    2569.8   30540.00
   11     5409.24   34.35    1.602  0.30( 0.28) 0.93    2679.3   30210.00
   12     5425.02   34.47    1.599  0.30( 0.28) 0.93    2698.5   30510.00
   13     5443.80   34.60    1.596  0.30( 0.28) 0.93    2720.3   30200.00
   14     5546.09   35.85    1.563  0.30( 0.28) 0.92    2902.8   30500.00
   15     5595.94   36.49    1.546  0.30( 0.28) 0.92    2994.6   30100.00
   16     5600.47   37.07    1.531  0.30( 0.28) 0.92    3069.3   30400.00
   17     5607.52   39.02    1.480  0.30( 0.27) 0.91    3315.9   30110.00
   18     5684.66   41.92    1.423  0.30( 0.27) 0.91    3692.3   30300.00
   19     5705.03   43.09    1.404  0.30( 0.27) 0.91    3830.4   21400.00
   20     5926.23   57.28    1.214  0.30( 0.26) 0.88    5359.0   13210.00
   21     5929.45   57.66    1.210  0.30( 0.26) 0.88    5397.1   13200.00
   22     5895.61   59.11    1.194  0.30( 0.26) 0.88    5501.0   13100.00
   23     5337.57   84.35    1.020  0.30( 0.26) 0.86    6752.1   13000.00
   24     5264.51   86.68    1.004  0.30( 0.26) 0.86    6771.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    5929.45  Tc(MIN.) =   57.66
 AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5397.13

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610212X.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      406.83   33.73  0.30( 0.30) 1.00     342.8   21200.00
   TOTAL AREA(ACRES) =      342.8

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4810.80   21.23    2.132  0.30( 0.28) 0.94    1533.5   30900.00
```

```
     2     4813.88   21.27    2.130  0.30( 0.28) 0.94    1536.4   30910.00
     3     4901.31   22.64    2.048  0.30( 0.28) 0.94    1650.9   31000.00
     4     4950.19   23.51    1.997  0.30( 0.28) 0.94    1719.5   30800.00
     5     5023.83   24.82    1.919  0.30( 0.28) 0.94    1830.3   30700.00
     6     5083.06   26.62    1.847  0.30( 0.28) 0.94    1978.5   30600.00
     7     5286.75   31.70    1.672  0.30( 0.28) 0.93    2417.1   21300.00
     8     5292.87   31.78    1.670  0.30( 0.28) 0.93    2427.0   30520.00
     9     5341.44   32.61    1.648  0.30( 0.28) 0.93    2515.4   30410.00
    10     5368.17   33.15    1.634  0.30( 0.28) 0.93    2569.8   30540.00
    11     5409.24   34.35    1.602  0.30( 0.28) 0.93    2679.3   30210.00
    12     5425.02   34.47    1.599  0.30( 0.28) 0.93    2698.5   30510.00
    13     5443.80   34.60    1.596  0.30( 0.28) 0.93    2720.3   30200.00
    14     5546.09   35.85    1.563  0.30( 0.28) 0.92    2902.8   30500.00
    15     5595.94   36.49    1.546  0.30( 0.28) 0.92    2994.6   30100.00
    16     5600.47   37.07    1.531  0.30( 0.28) 0.92    3069.3   30400.00
    17     5607.52   39.02    1.480  0.30( 0.27) 0.91    3315.9   30110.00
    18     5684.66   41.92    1.423  0.30( 0.27) 0.91    3692.3   30300.00
    19     5705.03   43.09    1.404  0.30( 0.27) 0.91    3830.4   21400.00
    20     5926.23   57.28    1.214  0.30( 0.26) 0.88    5359.0   13210.00
    21     5929.45   57.66    1.210  0.30( 0.26) 0.88    5397.1   13200.00
    22     5895.61   59.11    1.194  0.30( 0.26) 0.88    5501.0   13100.00
    23     5337.57   84.35    1.020  0.30( 0.26) 0.86    6752.1   13000.00
    24     5264.51   86.68    1.004  0.30( 0.26) 0.86    6771.8   13010.00
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      406.83   33.73    1.619  0.30( 0.30) 1.00     342.8   21200.00
LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  13308.00 =   11049.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     5166.50   21.23    2.132  0.30( 0.28) 0.95    1749.3   30900.00
    2     5169.76   21.27    2.130  0.30( 0.28) 0.95    1752.6   30910.00
    3     5263.36   22.64    2.048  0.30( 0.28) 0.95    1881.0   31000.00
    4     5315.10   23.51    1.997  0.30( 0.28) 0.95    1958.5   30800.00
    5     5391.49   24.82    1.919  0.30( 0.28) 0.95    2082.6   30700.00
    6     5459.60   26.62    1.847  0.30( 0.28) 0.95    2249.0   30600.00
    7     5684.53   31.70    1.672  0.30( 0.28) 0.94    2739.3   21300.00
    8     5691.07   31.78    1.670  0.30( 0.28) 0.94    2750.0   30520.00
    9     5743.53   32.61    1.648  0.30( 0.28) 0.94    2846.8   30410.00
   10     5772.62   33.15    1.634  0.30( 0.28) 0.94    2906.7   30540.00
   11     5794.74   33.73    1.619  0.30( 0.28) 0.94    2965.2   21200.00
   12     5811.01   34.35    1.602  0.30( 0.28) 0.94    3022.0   30210.00
   13     5825.85   34.47    1.599  0.30( 0.28) 0.94    3041.3   30510.00
   14     5843.54   34.60    1.596  0.30( 0.28) 0.94    3063.1   30200.00
   15     5935.78   35.85    1.563  0.30( 0.28) 0.93    3245.6   30500.00
   16     5980.40   36.49    1.546  0.30( 0.28) 0.93    3337.4   30100.00
   17     5980.27   37.07    1.531  0.30( 0.28) 0.93    3412.1   30400.00
   18     5971.56   39.02    1.480  0.30( 0.28) 0.92    3658.7   30110.00
   19     6031.15   41.92    1.423  0.30( 0.27) 0.92    4035.0   30300.00
   20     6045.68   43.09    1.404  0.30( 0.27) 0.91    4173.2   21400.00
   21     6208.10   57.28    1.214  0.30( 0.27) 0.89    5701.8   13210.00
   22     6210.04   57.66    1.210  0.30( 0.27) 0.89    5739.9   13200.00
   23     6171.37   59.11    1.194  0.30( 0.27) 0.88    5843.8   13100.00
   24     5559.69   84.35    1.020  0.30( 0.26) 0.87    7094.9   13000.00
```



```
     25     5481.78   86.68    1.004  0.30( 0.26) 0.87    7114.6   13010.00
    TOTAL AREA(ACRES) =      7114.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     6210.04  Tc(MIN.) =   57.664
  EFFECTIVE AREA(ACRES) =   5739.91  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.89
  TOTAL AREA(ACRES) =     7114.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S29.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    20671.71   18.24  0.30( 0.30) 0.99    3594.6   50400.00
      2    23751.62   27.53  0.30( 0.30) 0.99    6309.4   31100.00
      3    25884.18   34.42  0.30( 0.30) 0.99    8254.0   50150.00
      4    27181.63   38.13  0.30( 0.30) 0.99    9710.2   12710.00
      5    28670.75   45.52  0.30( 0.30) 0.99   12609.1   31400.00
      6    30184.93   53.75  0.30( 0.30) 0.99   15785.5   40100.00
      7    31446.76   62.97  0.30( 0.30) 0.99   19097.3   11801.00
      8    33272.70   73.80  0.30( 0.30) 0.99   23677.1   11530.00
      9    34271.04   78.19  0.30( 0.30) 0.99   25995.0   11701.00
     10    35115.75   81.64  0.30( 0.30) 0.99   28064.0   11910.00
     11    37650.64   91.87  0.30( 0.30) 0.99   34783.5   10800.00
     12    38294.63   96.11  0.30( 0.30) 0.99   37726.2   11130.00
     13    38259.52  105.70  0.30( 0.30) 0.99   42765.0   12410.00
     14    37929.23  113.97  0.30( 0.30) 0.99   46507.1   11201.00
     15    37611.12  118.93  0.30( 0.30) 0.99   48236.8   12201.00
     16    36701.56  125.94  0.30( 0.30) 0.99   50092.2   12231.00
     17    35530.55  133.71  0.30( 0.30) 0.99   51728.6   10400.00
     18    34311.67  141.60  0.30( 0.30) 0.99   53023.1   12010.00
     19    33234.81  147.53  0.30( 0.30) 0.99   53371.8   10210.00
     20    29532.04  175.54  0.30( 0.30) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =    54110.0
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    20671.71   18.24  0.30( 0.30) 0.99    3594.6   50400.00
      2    23751.62   27.53  0.30( 0.30) 0.99    6309.4   31100.00
      3    25884.18   34.42  0.30( 0.30) 0.99    8254.0   50150.00
      4    27181.63   38.13  0.30( 0.30) 0.99    9710.2   12710.00
      5    28670.75   45.52  0.30( 0.30) 0.99   12609.1   31400.00
      6    30184.93   53.75  0.30( 0.30) 0.99   15785.5   40100.00
      7    31446.76   62.97  0.30( 0.30) 0.99   19097.3   11801.00
      8    33272.70   73.80  0.30( 0.30) 0.99   23677.1   11530.00
      9    34271.04   78.19  0.30( 0.30) 0.99   25995.0   11701.00
     10    35115.75   81.64  0.30( 0.30) 0.99   28064.0   11910.00
     11    37650.64   91.87  0.30( 0.30) 0.99   34783.5   10800.00
     12    38294.63   96.11  0.30( 0.30) 0.99   37726.2   11130.00
     13    38259.52  105.70  0.30( 0.30) 0.99   42765.0   12410.00
     14    37929.23  113.97  0.30( 0.30) 0.99   46507.1   11201.00
     15    37611.12  118.93  0.30( 0.30) 0.99   48236.8   12201.00
     16    36701.56  125.94  0.30( 0.30) 0.99   50092.2   12231.00
     17    35530.55  133.71  0.30( 0.30) 0.99   51728.6   10400.00
     18    34311.67  141.60  0.30( 0.30) 0.99   53023.1   12010.00
     19    33234.81  147.53  0.30( 0.30) 0.99   53371.8   10210.00
     20    29532.04  175.54  0.30( 0.30) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =     54110.0

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  13308.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    213.00  DOWNSTREAM(FEET) =    212.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1389.52   CHANNEL SLOPE =  0.0007
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  17.70
  CHANNEL FLOW THRU SUBAREA(CFS) =   38294.63
  FLOW VELOCITY(FEET/SEC.) =   7.50   FLOW DEPTH(FEET) =  17.70
  TRAVEL TIME(MIN.) =   3.09   Tc(MIN.) =   99.20
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20671.71   21.96    2.088  0.30( 0.30) 0.99    3594.6   50400.00
      2    23751.62   31.09    1.688  0.30( 0.30) 0.99    6309.4   31100.00
      3    25884.18   37.90    1.509  0.30( 0.30) 0.99    8254.0   50150.00
      4    27181.63   41.56    1.429  0.30( 0.30) 0.99    9710.2   12710.00
      5    28670.75   48.89    1.310  0.30( 0.30) 0.99   12609.1   31400.00
      6    30184.93   57.06    1.216  0.30( 0.30) 0.99   15785.5   40100.00
      7    31446.76   66.24    1.142  0.30( 0.30) 0.99   19097.3   11801.00
```



```
      8    33272.70   77.02    1.069  0.30( 0.30) 0.99   23677.1   11530.00
      9    34271.04   81.38    1.040  0.30( 0.30) 0.99   25995.0   11701.00
     10    35115.75   84.81    1.017  0.30( 0.30) 0.99   28064.0   11910.00
     11    37650.64   94.97    0.960  0.30( 0.30) 0.99   34783.5   10800.00
     12    38294.63   99.20    0.942  0.30( 0.30) 0.99   37726.2   11130.00
     13    38259.52  108.79    0.900  0.30( 0.30) 0.99   42765.0   12410.00
     14    37929.23  117.07    0.864  0.30( 0.30) 0.99   46507.1   11201.00
     15    37611.12  122.03    0.848  0.30( 0.30) 0.99   48236.8   12201.00
     16    36701.56  129.07    0.833  0.30( 0.30) 0.99   50092.2   12231.00
     17    35530.55  136.87    0.817  0.30( 0.30) 0.99   51728.6   10400.00
     18    34311.67  144.79    0.801  0.30( 0.30) 0.99   53023.1   12010.00
     19    33234.81  150.75    0.788  0.30( 0.30) 0.99   53371.8   10210.00
     20    29532.04  178.88    0.730  0.30( 0.30) 0.99   54110.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   38294.63  Tc(MIN.) =   99.20
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   37726.23

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    20671.71   21.96    2.088  0.30( 0.30) 0.99    3594.6   50400.00
      2    23751.62   31.09    1.688  0.30( 0.30) 0.99    6309.4   31100.00
      3    25884.18   37.90    1.509  0.30( 0.30) 0.99    8254.0   50150.00
      4    27181.63   41.56    1.429  0.30( 0.30) 0.99    9710.2   12710.00
      5    28670.75   48.89    1.310  0.30( 0.30) 0.99   12609.1   31400.00
      6    30184.93   57.06    1.216  0.30( 0.30) 0.99   15785.5   40100.00
      7    31446.76   66.24    1.142  0.30( 0.30) 0.99   19097.3   11801.00
      8    33272.70   77.02    1.069  0.30( 0.30) 0.99   23677.1   11530.00
      9    34271.04   81.38    1.040  0.30( 0.30) 0.99   25995.0   11701.00
     10    35115.75   84.81    1.017  0.30( 0.30) 0.99   28064.0   11910.00
     11    37650.64   94.97    0.960  0.30( 0.30) 0.99   34783.5   10800.00
     12    38294.63   99.20    0.942  0.30( 0.30) 0.99   37726.2   11130.00
     13    38259.52  108.79    0.900  0.30( 0.30) 0.99   42765.0   12410.00
     14    37929.23  117.07    0.864  0.30( 0.30) 0.99   46507.1   11201.00
     15    37611.12  122.03    0.848  0.30( 0.30) 0.99   48236.8   12201.00
     16    36701.56  129.07    0.833  0.30( 0.30) 0.99   50092.2   12231.00
     17    35530.55  136.87    0.817  0.30( 0.30) 0.99   51728.6   10400.00
     18    34311.67  144.79    0.801  0.30( 0.30) 0.99   53023.1   12010.00
     19    33234.81  150.75    0.788  0.30( 0.30) 0.99   53371.8   10210.00
     20    29532.04  178.88    0.730  0.30( 0.30) 0.99   54110.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5166.50   21.23    2.132  0.30( 0.28) 0.95    1749.3   30900.00
      2     5169.76   21.27    2.130  0.30( 0.28) 0.95    1752.6   30910.00
      3     5263.36   22.64    2.048  0.30( 0.28) 0.95    1881.0   31000.00
      4     5315.10   23.51    1.997  0.30( 0.28) 0.95    1958.5   30800.00
      5     5391.49   24.82    1.919  0.30( 0.28) 0.95    2082.6   30700.00
      6     5459.60   26.62    1.847  0.30( 0.28) 0.95    2249.0   30600.00
```

7	5684.53	31.70	1.672	0.30(0.28)	0.94	2739.3	21300.00
8	5691.07	31.78	1.670	0.30(0.28)	0.94	2750.0	30520.00
9	5743.53	32.61	1.648	0.30(0.28)	0.94	2846.8	30410.00
10	5772.62	33.15	1.634	0.30(0.28)	0.94	2906.7	30540.00
11	5794.74	33.73	1.619	0.30(0.28)	0.94	2965.2	21200.00
12	5811.01	34.35	1.602	0.30(0.28)	0.94	3022.0	30210.00
13	5825.85	34.47	1.599	0.30(0.28)	0.94	3041.3	30510.00
14	5843.54	34.60	1.596	0.30(0.28)	0.94	3063.1	30200.00
15	5935.78	35.85	1.563	0.30(0.28)	0.93	3245.6	30500.00
16	5980.40	36.49	1.546	0.30(0.28)	0.93	3337.4	30100.00
17	5980.27	37.07	1.531	0.30(0.28)	0.93	3412.1	30400.00
18	5971.56	39.02	1.480	0.30(0.28)	0.92	3658.7	30110.00
19	6031.15	41.92	1.423	0.30(0.27)	0.92	4035.0	30300.00
20	6045.68	43.09	1.404	0.30(0.27)	0.91	4173.2	21400.00
21	6208.10	57.28	1.214	0.30(0.27)	0.89	5701.8	13210.00
22	6210.04	57.66	1.210	0.30(0.27)	0.89	5739.9	13200.00
23	6171.37	59.11	1.194	0.30(0.27)	0.88	5843.8	13100.00
24	5559.69	84.35	1.020	0.30(0.26)	0.87	7094.9	13000.00
25	5481.78	86.68	1.004	0.30(0.26)	0.87	7114.6	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25632.12	21.23	2.132	0.30(0.29)	0.97	5224.3	30900.00
2	25645.98	21.27	2.130	0.30(0.29)	0.97	5233.3	30910.00
3	25888.89	21.96	2.088	0.30(0.29)	0.97	5412.2	50400.00
4	26163.46	22.64	2.048	0.30(0.29)	0.97	5676.9	31000.00
5	26509.36	23.51	1.997	0.30(0.29)	0.97	6013.7	30800.00
6	27027.57	24.82	1.919	0.30(0.29)	0.97	6527.3	30700.00
7	27700.84	26.62	1.847	0.30(0.29)	0.97	7227.0	30600.00
8	29409.46	31.09	1.688	0.30(0.29)	0.97	8990.5	31100.00
9	29625.10	31.70	1.672	0.30(0.29)	0.97	9221.0	21300.00
10	29658.46	31.78	1.670	0.30(0.29)	0.97	9256.2	30520.00
11	29969.61	32.61	1.648	0.30(0.29)	0.97	9588.9	30410.00
12	30167.93	33.15	1.634	0.30(0.29)	0.97	9803.0	30540.00
13	30371.58	33.73	1.619	0.30(0.29)	0.97	10027.1	21200.00
14	30583.91	34.35	1.602	0.30(0.29)	0.97	10262.7	30210.00
15	30635.25	34.47	1.599	0.30(0.29)	0.97	10315.3	30510.00
16	30694.90	34.60	1.596	0.30(0.29)	0.97	10375.3	30200.00
17	31176.65	35.85	1.563	0.30(0.29)	0.97	10913.0	30500.00
18	31423.88	36.49	1.546	0.30(0.29)	0.97	11189.5	30100.00
19	31604.26	37.07	1.531	0.30(0.29)	0.97	11428.8	30400.00
20	31860.74	37.90	1.509	0.30(0.29)	0.97	11771.2	50150.00
21	32252.10	39.02	1.480	0.30(0.29)	0.97	12357.5	30110.00
22	33205.34	41.56	1.429	0.30(0.29)	0.97	13698.2	12710.00
23	33286.43	41.92	1.423	0.30(0.29)	0.97	13888.6	30300.00
24	33538.32	43.09	1.404	0.30(0.29)	0.97	14488.8	21400.00
25	34782.83	48.89	1.310	0.30(0.29)	0.97	17407.2	31400.00
26	36390.55	57.06	1.216	0.30(0.29)	0.96	21464.0	40100.00
27	36422.72	57.28	1.214	0.30(0.29)	0.96	21565.2	13210.00
28	36477.48	57.66	1.210	0.30(0.29)	0.96	21742.0	13200.00
29	36638.21	59.11	1.194	0.30(0.29)	0.96	22369.2	13100.00
30	37445.36	66.24	1.142	0.30(0.29)	0.96	25294.4	11801.00
31	39010.07	77.02	1.069	0.30(0.29)	0.97	30408.5	11530.00
32	39902.78	81.38	1.040	0.30(0.29)	0.97	32942.5	11701.00
33	40562.33	84.35	1.020	0.30(0.29)	0.97	34881.8	13000.00
34	40660.07	84.81	1.017	0.30(0.29)	0.97	35162.8	11910.00

35	41064.37	86.68	1.004	0.30(0.29)	0.97	36416.1	13010.00
36	42808.28	94.97	0.960	0.30(0.29)	0.97	41898.1	10800.00
37	43317.02	99.20	0.942	0.30(0.29)	0.97	44840.8	11130.00
38	42975.27	108.79	0.900	0.30(0.29)	0.98	49879.6	12410.00
39	42380.00	117.07	0.864	0.30(0.29)	0.98	53621.7	11201.00
40	41937.30	122.03	0.848	0.30(0.29)	0.98	55351.4	12201.00
41	40920.70	129.07	0.833	0.30(0.29)	0.98	57206.8	12231.00
42	39631.05	136.87	0.817	0.30(0.29)	0.98	58843.2	10400.00
43	38291.70	144.79	0.801	0.30(0.29)	0.98	60137.7	12010.00
44	37124.16	150.75	0.788	0.30(0.29)	0.98	60486.4	10210.00
45	32993.59	178.88	0.730	0.30(0.29)	0.98	61224.6	10100.00

TOTAL AREA(ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 43317.02 Tc(MIN.) = 99.200
EFFECTIVE AREA(ACRES) = 44840.84 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 61224.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 61224.6 TC(MIN.) = 99.20
EFFECTIVE AREA(ACRES) = 44840.84 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.973
PEAK FLOW RATE(CFS) = 43317.02

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25632.12	21.23	2.132	0.30(0.29)	0.97	5224.3	30900.00
2	25645.98	21.27	2.130	0.30(0.29)	0.97	5233.3	30910.00
3	25888.89	21.96	2.088	0.30(0.29)	0.97	5412.2	50400.00
4	26163.46	22.64	2.048	0.30(0.29)	0.97	5676.9	31000.00
5	26509.36	23.51	1.997	0.30(0.29)	0.97	6013.7	30800.00
6	27027.57	24.82	1.919	0.30(0.29)	0.97	6527.3	30700.00
7	27700.84	26.62	1.847	0.30(0.29)	0.97	7227.0	30600.00
8	29409.46	31.09	1.688	0.30(0.29)	0.97	8990.5	31100.00
9	29625.10	31.70	1.672	0.30(0.29)	0.97	9221.0	21300.00
10	29658.46	31.78	1.670	0.30(0.29)	0.97	9256.2	30520.00
11	29969.61	32.61	1.648	0.30(0.29)	0.97	9588.9	30410.00
12	30167.93	33.15	1.634	0.30(0.29)	0.97	9803.0	30540.00
13	30371.58	33.73	1.619	0.30(0.29)	0.97	10027.1	21200.00
14	30583.91	34.35	1.602	0.30(0.29)	0.97	10262.7	30210.00
15	30635.25	34.47	1.599	0.30(0.29)	0.97	10315.3	30510.00
16	30694.90	34.60	1.596	0.30(0.29)	0.97	10375.3	30200.00
17	31176.65	35.85	1.563	0.30(0.29)	0.97	10913.0	30500.00
18	31423.88	36.49	1.546	0.30(0.29)	0.97	11189.5	30100.00
19	31604.26	37.07	1.531	0.30(0.29)	0.97	11428.8	30400.00
20	31860.74	37.90	1.509	0.30(0.29)	0.97	11771.2	50150.00
21	32252.10	39.02	1.480	0.30(0.29)	0.97	12357.5	30110.00
22	33205.34	41.56	1.429	0.30(0.29)	0.97	13698.2	12710.00
23	33286.43	41.92	1.423	0.30(0.29)	0.97	13888.6	30300.00
24	33538.32	43.09	1.404	0.30(0.29)	0.97	14488.8	21400.00
25	34782.83	48.89	1.310	0.30(0.29)	0.97	17407.2	31400.00
26	36390.55	57.06	1.216	0.30(0.29)	0.96	21464.0	40100.00
27	36422.72	57.28	1.214	0.30(0.29)	0.96	21565.2	13210.00
28	36477.48	57.66	1.210	0.30(0.29)	0.96	21742.0	13200.00
29	36638.21	59.11	1.194	0.30(0.29)	0.96	22369.2	13100.00

30	37445.36	66.24	1.142	0.30(	0.29)	0.96	25294.4	11801.00
31	39010.07	77.02	1.069	0.30(	0.29)	0.97	30408.5	11530.00
32	39902.78	81.38	1.040	0.30(	0.29)	0.97	32942.5	11701.00
33	40562.33	84.35	1.020	0.30(	0.29)	0.97	34881.8	13000.00
34	40660.07	84.81	1.017	0.30(	0.29)	0.97	35162.8	11910.00
35	41064.37	86.68	1.004	0.30(	0.29)	0.97	36416.1	13010.00
36	42808.28	94.97	0.960	0.30(	0.29)	0.97	41898.1	10800.00
37	43317.02	99.20	0.942	0.30(	0.29)	0.97	44840.8	11130.00
38	42975.27	108.79	0.900	0.30(	0.29)	0.98	49879.6	12410.00
39	42380.00	117.07	0.864	0.30(	0.29)	0.98	53621.7	11201.00
40	41937.30	122.03	0.848	0.30(	0.29)	0.98	55351.4	12201.00
41	40920.70	129.07	0.833	0.30(	0.29)	0.98	57206.8	12231.00
42	39631.05	136.87	0.817	0.30(	0.29)	0.98	58843.2	10400.00
43	38291.70	144.79	0.801	0.30(	0.29)	0.98	60137.7	12010.00
44	37124.16	150.75	0.788	0.30(	0.29)	0.98	60486.4	10210.00
45	32993.59	178.88	0.730	0.30(	0.29)	0.98	61224.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S34.DAT
  TIME/DATE OF STUDY: 10:46 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.308
   2)   10.00;  3.422
   3)   15.00;  2.630
   4)   20.00;  2.201
   5)   25.00;  1.906
   6)   30.00;  1.714
   7)   40.00;  1.453
   8)   50.00;  1.291
   9)   60.00;  1.182
  10)   90.00;  0.979
  11)  120.00;  0.849
  12)  180.00;  0.725
  13)  360.00;  0.534
  14) 1200.00;  0.233
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S33.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    27700.84   26.62  0.30( 0.29) 0.97    7227.0   30600.00
      2    30694.90   34.60  0.30( 0.29) 0.97   10375.3   30200.00
      3    32252.10   39.02  0.30( 0.29) 0.97   12357.5   30110.00
      4    33538.32   43.09  0.30( 0.29) 0.97   14488.8   21400.00
      5    34782.83   48.89  0.30( 0.29) 0.97   17407.2   31400.00
      6    36638.21   59.11  0.30( 0.29) 0.96   22369.2   13100.00
      7    37445.36   66.24  0.30( 0.29) 0.96   25294.4   11801.00
      8    39010.07   77.02  0.30( 0.29) 0.97   30408.5   11530.00
      9    39902.78   81.38  0.30( 0.29) 0.97   32942.5   11701.00
     10    41064.37   86.68  0.30( 0.29) 0.97   36416.1   13010.00
     11    42808.28   94.97  0.30( 0.29) 0.97   41898.1   10800.00
     12    43317.02   99.20  0.30( 0.29) 0.97   44840.8   11130.00
     13    42975.27  108.79  0.30( 0.29) 0.98   49879.6   12410.00
     14    42380.00  117.07  0.30( 0.29) 0.98   53621.7   11201.00
     15    41937.30  122.03  0.30( 0.29) 0.98   55351.4   12201.00
     16    40920.70  129.07  0.30( 0.29) 0.98   57206.8   12231.00
     17    39631.05  136.87  0.30( 0.29) 0.98   58843.2   10400.00
     18    38291.70  144.79  0.30( 0.29) 0.98   60137.7   12010.00
     19    37124.16  150.75  0.30( 0.29) 0.98   60486.4   10210.00
     20    32993.59  178.88  0.30( 0.29) 0.98   61224.6   10100.00
   TOTAL AREA(ACRES) =    61224.6

**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    27700.84   26.62  0.30( 0.29) 0.97    7227.0   30600.00
      2    30694.90   34.60  0.30( 0.29) 0.97   10375.3   30200.00
      3    32252.10   39.02  0.30( 0.29) 0.97   12357.5   30110.00
      4    33538.32   43.09  0.30( 0.29) 0.97   14488.8   21400.00
      5    34782.83   48.89  0.30( 0.29) 0.97   17407.2   31400.00
      6    36638.21   59.11  0.30( 0.29) 0.96   22369.2   13100.00
      7    37445.36   66.24  0.30( 0.29) 0.96   25294.4   11801.00
      8    39010.07   77.02  0.30( 0.29) 0.97   30408.5   11530.00
      9    39902.78   81.38  0.30( 0.29) 0.97   32942.5   11701.00
     10    41064.37   86.68  0.30( 0.29) 0.97   36416.1   13010.00
     11    42808.28   94.97  0.30( 0.29) 0.97   41898.1   10800.00
     12    43317.02   99.20  0.30( 0.29) 0.97   44840.8   11130.00
     13    42975.27  108.79  0.30( 0.29) 0.98   49879.6   12410.00
     14    42380.00  117.07  0.30( 0.29) 0.98   53621.7   11201.00
     15    41937.30  122.03  0.30( 0.29) 0.98   55351.4   12201.00
     16    40920.70  129.07  0.30( 0.29) 0.98   57206.8   12231.00
     17    39631.05  136.87  0.30( 0.29) 0.98   58843.2   10400.00
     18    38291.70  144.79  0.30( 0.29) 0.98   60137.7   12010.00
```

```
    19    37124.16  150.75  0.30( 0.29) 0.98   60486.4   10210.00
    20    32993.59  178.88  0.30( 0.29) 0.98   61224.6   10100.00
   TOTAL AREA(ACRES) =     61224.6

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13402.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    212.00  DOWNSTREAM(FEET) =    209.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   623.02   CHANNEL SLOPE =  0.0048
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.24
  CHANNEL FLOW THRU SUBAREA(CFS) =   43317.02
  FLOW VELOCITY(FEET/SEC.) =  15.04   FLOW DEPTH(FEET) =  11.24
  TRAVEL TIME(MIN.) =   0.69   Tc(MIN.) =   99.89
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    27700.84   27.41    1.813  0.30( 0.29) 0.97    7227.0   30600.00
      2    30694.90   35.37    1.574  0.30( 0.29) 0.97   10375.3   30200.00
      3    32252.10   39.77    1.459  0.30( 0.29) 0.97   12357.5   30110.00
      4    33538.32   43.84    1.391  0.30( 0.29) 0.97   14488.8   21400.00
      5    34782.83   49.63    1.297  0.30( 0.29) 0.97   17407.2   31400.00
      6    36638.21   59.84    1.184  0.30( 0.29) 0.96   22369.2   13100.00
      7    37445.36   66.97    1.135  0.30( 0.29) 0.96   25294.4   11801.00
      8    39010.07   77.73    1.062  0.30( 0.29) 0.97   30408.5   11530.00
      9    39902.78   82.09    1.033  0.30( 0.29) 0.97   32942.5   11701.00
     10    41064.37   87.38    0.997  0.30( 0.29) 0.97   36416.1   13010.00
     11    42808.28   95.66    0.954  0.30( 0.29) 0.97   41898.1   10800.00
     12    43317.02   99.89    0.936  0.30( 0.29) 0.97   44840.8   11130.00
     13    42975.27  109.48    0.895  0.30( 0.29) 0.98   49879.6   12410.00
     14    42380.00  117.77    0.859  0.30( 0.29) 0.98   53621.7   11201.00
     15    41937.30  122.73    0.843  0.30( 0.29) 0.98   55351.4   12201.00
     16    40920.70  129.77    0.829  0.30( 0.29) 0.98   57206.8   12231.00
     17    39631.05  137.58    0.813  0.30( 0.29) 0.98   58843.2   10400.00
     18    38291.70  145.51    0.796  0.30( 0.29) 0.98   60137.7   12010.00
     19    37124.16  151.48    0.784  0.30( 0.29) 0.98   60486.4   10210.00
     20    32993.59  179.63    0.726  0.30( 0.29) 0.98   61224.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   43317.02  Tc(MIN.) =   99.89
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   44840.84

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610505X.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)         (ACRES)    NODE
      1      265.16   19.79  0.30( 0.30) 0.99     153.2   50500.00
```



```
    TOTAL AREA(ACRES) =      153.2

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    27700.84   27.41    1.813  0.30( 0.29) 0.97    7227.0   30600.00
      2    30694.90   35.37    1.574  0.30( 0.29) 0.97   10375.3   30200.00
      3    32252.10   39.77    1.459  0.30( 0.29) 0.97   12357.5   30110.00
      4    33538.32   43.84    1.391  0.30( 0.29) 0.97   14488.8   21400.00
      5    34782.83   49.63    1.297  0.30( 0.29) 0.97   17407.2   31400.00
      6    36638.21   59.84    1.184  0.30( 0.29) 0.96   22369.2   13100.00
      7    37445.36   66.97    1.135  0.30( 0.29) 0.96   25294.4   11801.00
      8    39010.07   77.73    1.062  0.30( 0.29) 0.97   30408.5   11530.00
      9    39902.78   82.09    1.033  0.30( 0.29) 0.97   32942.5   11701.00
     10    41064.37   87.38    0.997  0.30( 0.29) 0.97   36416.1   13010.00
     11    42808.28   95.66    0.954  0.30( 0.29) 0.97   41898.1   10800.00
     12    43317.02   99.89    0.936  0.30( 0.29) 0.97   44840.8   11130.00
     13    42975.27  109.48    0.895  0.30( 0.29) 0.98   49879.6   12410.00
     14    42380.00  117.77    0.859  0.30( 0.29) 0.98   53621.7   11201.00
     15    41937.30  122.73    0.843  0.30( 0.29) 0.98   55351.4   12201.00
     16    40920.70  129.77    0.829  0.30( 0.29) 0.98   57206.8   12231.00
     17    39631.05  137.58    0.813  0.30( 0.29) 0.98   58843.2   10400.00
     18    38291.70  145.51    0.796  0.30( 0.29) 0.98   60137.7   12010.00
     19    37124.16  151.48    0.784  0.30( 0.29) 0.98   60486.4   10210.00
     20    32993.59  179.63    0.726  0.30( 0.29) 0.98   61224.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      265.16   19.79    2.219  0.30( 0.30) 0.99     153.2   50500.00
  LONGEST FLOWPATH FROM NODE  50500.00 TO NODE  13402.00 =    6247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    25594.69   19.79    2.219  0.30( 0.29) 0.97    5369.2   50500.00
      2    27910.03   27.41    1.813  0.30( 0.29) 0.97    7380.2   30600.00
      3    30871.06   35.37    1.574  0.30( 0.29) 0.97   10528.5   30200.00
      4    32412.42   39.77    1.459  0.30( 0.29) 0.97   12510.7   30110.00
      5    33689.27   43.84    1.391  0.30( 0.29) 0.97   14642.0   21400.00
      6    34920.84   49.63    1.297  0.30( 0.29) 0.97   17560.4   31400.00
      7    36760.61   59.84    1.184  0.30( 0.29) 0.96   22522.4   13100.00
      8    37561.02   66.97    1.135  0.30( 0.29) 0.96   25447.6   11801.00
      9    39115.69   77.73    1.062  0.30( 0.29) 0.97   30561.7   11530.00
     10    40004.34   82.09    1.033  0.30( 0.29) 0.97   33095.7   11701.00
     11    41160.98   87.38    0.997  0.30( 0.29) 0.97   36569.3   13010.00
     12    42899.07   95.66    0.954  0.30( 0.29) 0.97   42051.3   10800.00
     13    43405.28   99.89    0.936  0.30( 0.29) 0.97   44994.0   11130.00
     14    43057.80  109.48    0.895  0.30( 0.29) 0.98   50032.8   12410.00
     15    42457.59  117.77    0.859  0.30( 0.29) 0.98   53774.9   11201.00
     16    42012.77  122.73    0.843  0.30( 0.29) 0.98   55504.6   12201.00
```

```
    17    40994.18  129.77    0.829  0.30( 0.29) 0.98   57360.0   12231.00
    18    39702.29  137.58    0.813  0.30( 0.29) 0.98   58996.4   10400.00
    19    38360.69  145.51    0.796  0.30( 0.29) 0.98   60290.9   12010.00
    20    37191.45  151.48    0.784  0.30( 0.29) 0.98   60639.6   10210.00
    21    33052.85  179.63    0.726  0.30( 0.29) 0.98   61377.8   10100.00
   TOTAL AREA(ACRES) =     61377.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    43405.28  Tc(MIN.) =   99.891
  EFFECTIVE AREA(ACRES) =  44994.02  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61377.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    209.00  DOWNSTREAM(FEET) =    207.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.35   CHANNEL SLOPE =  0.0051
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.10
  CHANNEL FLOW THRU SUBAREA(CFS) =   43405.28
  FLOW VELOCITY(FEET/SEC.) =  15.31   FLOW DEPTH(FEET) =  11.10
  TRAVEL TIME(MIN.) =   0.43   Tc(MIN.) =  100.32
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25594.69   20.30    2.183  0.30( 0.29) 0.97    5369.2   50500.00
      2    27910.03   27.91    1.794  0.30( 0.29) 0.97    7380.2   30600.00
      3    30871.06   35.86    1.561  0.30( 0.29) 0.97   10528.5   30200.00
      4    32412.42   40.25    1.449  0.30( 0.29) 0.97   12510.7   30110.00
      5    33689.27   44.31    1.383  0.30( 0.29) 0.97   14642.0   21400.00
      6    34920.84   50.09    1.290  0.30( 0.29) 0.97   17560.4   31400.00
      7    36760.61   60.30    1.180  0.30( 0.29) 0.96   22522.4   13100.00
      8    37561.02   67.42    1.132  0.30( 0.29) 0.96   25447.6   11801.00
      9    39115.69   78.18    1.059  0.30( 0.29) 0.97   30561.7   11530.00
     10    40004.34   82.53    1.030  0.30( 0.29) 0.97   33095.7   11701.00
     11    41160.98   87.82    0.994  0.30( 0.29) 0.97   36569.3   13010.00
     12    42899.07   96.10    0.953  0.30( 0.29) 0.97   42051.3   10800.00
     13    43405.28  100.32    0.934  0.30( 0.29) 0.97   44994.0   11130.00
     14    43057.80  109.91    0.893  0.30( 0.29) 0.98   50032.8   12410.00
     15    42457.59  118.20    0.857  0.30( 0.29) 0.98   53774.9   11201.00
     16    42012.77  123.16    0.842  0.30( 0.29) 0.98   55504.6   12201.00
     17    40994.18  130.21    0.828  0.30( 0.29) 0.98   57360.0   12231.00
     18    39702.29  138.02    0.812  0.30( 0.29) 0.98   58996.4   10400.00
     19    38360.69  145.95    0.795  0.30( 0.29) 0.98   60290.9   12010.00
     20    37191.45  151.93    0.783  0.30( 0.29) 0.98   60639.6   10210.00
     21    33052.85  180.10    0.725  0.30( 0.29) 0.98   61377.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   43405.28  Tc(MIN.) =  100.32
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   44994.02
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610506X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       94.69   17.43  0.30( 0.30) 1.00      49.6   50600.00
    TOTAL AREA(ACRES) =       49.6

****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25594.69   20.30    2.183  0.30( 0.29) 0.97    5369.2   50500.00
      2    27910.03   27.91    1.794  0.30( 0.29) 0.97    7380.2   30600.00
      3    30871.06   35.86    1.561  0.30( 0.29) 0.97   10528.5   30200.00
      4    32412.42   40.25    1.449  0.30( 0.29) 0.97   12510.7   30110.00
      5    33689.27   44.31    1.383  0.30( 0.29) 0.97   14642.0   21400.00
      6    34920.84   50.09    1.290  0.30( 0.29) 0.97   17560.4   31400.00
      7    36760.61   60.30    1.180  0.30( 0.29) 0.96   22522.4   13100.00
      8    37561.02   67.42    1.132  0.30( 0.29) 0.96   25447.6   11801.00
      9    39115.69   78.18    1.059  0.30( 0.29) 0.97   30561.7   11530.00
     10    40004.34   82.53    1.030  0.30( 0.29) 0.97   33095.7   11701.00
     11    41160.98   87.82    0.994  0.30( 0.29) 0.97   36569.3   13010.00
     12    42899.07   96.10    0.953  0.30( 0.29) 0.97   42051.3   10800.00
     13    43405.28  100.32    0.934  0.30( 0.29) 0.97   44994.0   11130.00
     14    43057.80  109.91    0.893  0.30( 0.29) 0.98   50032.8   12410.00
     15    42457.59  118.20    0.857  0.30( 0.29) 0.98   53774.9   11201.00
     16    42012.77  123.16    0.842  0.30( 0.29) 0.98   55504.6   12201.00
     17    40994.18  130.21    0.828  0.30( 0.29) 0.98   57360.0   12231.00
     18    39702.29  138.02    0.812  0.30( 0.29) 0.98   58996.4   10400.00
     19    38360.69  145.95    0.795  0.30( 0.29) 0.98   60290.9   12010.00
     20    37191.45  151.93    0.783  0.30( 0.29) 0.98   60639.6   10210.00
     21    33052.85  180.10    0.725  0.30( 0.29) 0.98   61377.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       94.69   17.43    2.421  0.30( 0.30) 1.00      49.6   50600.00
  LONGEST FLOWPATH FROM NODE  50600.00 TO NODE  13404.00 =    4378.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24840.38   17.43    2.421  0.30( 0.29) 0.97    4660.5   50600.00
      2    25678.76   20.30    2.183  0.30( 0.29) 0.97    5418.8   50500.00
      3    27976.72   27.91    1.794  0.30( 0.29) 0.97    7429.8   30600.00
      4    30927.35   35.86    1.561  0.30( 0.29) 0.97   10578.1   30200.00
```

```
      5    32463.71   40.25    1.449  0.30( 0.29) 0.97   12560.3   30110.00
      6    33737.62   44.31    1.383  0.30( 0.29) 0.97   14691.6   21400.00
      7    34965.02   50.09    1.290  0.30( 0.29) 0.97   17610.0   31400.00
      8    36799.88   60.30    1.180  0.30( 0.29) 0.96   22572.0   13100.00
      9    37598.15   67.42    1.132  0.30( 0.29) 0.96   25497.2   11801.00
     10    39149.57   78.18    1.059  0.30( 0.29) 0.97   30611.3   11530.00
     11    40036.90   82.53    1.030  0.30( 0.29) 0.97   33145.3   11701.00
     12    41191.95   87.82    0.994  0.30( 0.29) 0.97   36618.9   13010.00
     13    42928.20   96.10    0.953  0.30( 0.29) 0.97   42100.9   10800.00
     14    43433.59  100.32    0.934  0.30( 0.29) 0.97   45043.6   11130.00
     15    43084.26  109.91    0.893  0.30( 0.29) 0.98   50082.4   12410.00
     16    42482.45  118.20    0.857  0.30( 0.29) 0.98   53824.5   11201.00
     17    42036.99  123.16    0.842  0.30( 0.29) 0.98   55554.2   12201.00
     18    41017.74  130.21    0.828  0.30( 0.29) 0.98   57409.6   12231.00
     19    39725.14  138.02    0.812  0.30( 0.29) 0.98   59046.0   10400.00
     20    38382.80  145.95    0.795  0.30( 0.29) 0.98   60340.5   12010.00
     21    37213.00  151.93    0.783  0.30( 0.29) 0.98   60689.2   10210.00
     22    33071.82  180.10    0.725  0.30( 0.29) 0.98   61427.4   10100.00
   TOTAL AREA(ACRES) =     61427.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    43433.59  Tc(MIN.) =  100.321
  EFFECTIVE AREA(ACRES) =  45043.62  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61427.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13406.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    207.00  DOWNSTREAM(FEET) =    195.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1601.97   CHANNEL SLOPE =  0.0075
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.94
  CHANNEL FLOW THRU SUBAREA(CFS) =   43433.59
  FLOW VELOCITY(FEET/SEC.) =  17.49   FLOW DEPTH(FEET) =   9.94
  TRAVEL TIME(MIN.) =   1.53   Tc(MIN.) =  101.85
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24840.38   19.27    2.264  0.30( 0.29) 0.97    4660.5   50600.00
      2    25678.76   22.11    2.076  0.30( 0.29) 0.97    5418.8   50500.00
      3    27976.72   29.68    1.726  0.30( 0.29) 0.97    7429.8   30600.00
      4    30927.35   37.56    1.517  0.30( 0.29) 0.97   10578.1   30200.00
      5    32463.71   41.93    1.422  0.30( 0.29) 0.97   12560.3   30110.00
      6    33737.62   45.96    1.356  0.30( 0.29) 0.97   14691.6   21400.00
      7    34965.02   51.73    1.272  0.30( 0.29) 0.97   17610.0   31400.00
      8    36799.88   61.91    1.169  0.30( 0.29) 0.96   22572.0   13100.00
      9    37598.15   69.02    1.121  0.30( 0.29) 0.96   25497.2   11801.00
     10    39149.57   79.76    1.048  0.30( 0.29) 0.97   30611.3   11530.00
     11    40036.90   84.10    1.019  0.30( 0.29) 0.97   33145.3   11701.00
     12    41191.95   89.38    0.983  0.30( 0.29) 0.97   36618.9   13010.00
```



```
     13    42928.20   97.63    0.946  0.30( 0.29) 0.97   42100.9   10800.00
     14    43433.59  101.85    0.928  0.30( 0.29) 0.97   45043.6   11130.00
     15    43084.26  111.44    0.886  0.30( 0.29) 0.98   50082.4   12410.00
     16    42482.45  119.74    0.850  0.30( 0.29) 0.98   53824.5   11201.00
     17    42036.99  124.70    0.839  0.30( 0.29) 0.98   55554.2   12201.00
     18    41017.74  131.76    0.825  0.30( 0.29) 0.98   57409.6   12231.00
     19    39725.14  139.59    0.809  0.30( 0.29) 0.98   59046.0   10400.00
     20    38382.80  147.54    0.792  0.30( 0.29) 0.98   60340.5   12010.00
     21    37213.00  153.53    0.780  0.30( 0.29) 0.98   60689.2   10210.00
     22    33071.82  181.77    0.723  0.30( 0.29) 0.98   61427.4   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   43433.59  Tc(MIN.) =  101.85
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   45043.62

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610211X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      209.22   12.84  0.30( 0.30) 1.00      87.0   21100.00
    TOTAL AREA(ACRES) =       87.0

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24840.38   19.27    2.264  0.30( 0.29) 0.97    4660.5   50600.00
      2    25678.76   22.11    2.076  0.30( 0.29) 0.97    5418.8   50500.00
      3    27976.72   29.68    1.726  0.30( 0.29) 0.97    7429.8   30600.00
      4    30927.35   37.56    1.517  0.30( 0.29) 0.97   10578.1   30200.00
      5    32463.71   41.93    1.422  0.30( 0.29) 0.97   12560.3   30110.00
      6    33737.62   45.96    1.356  0.30( 0.29) 0.97   14691.6   21400.00
      7    34965.02   51.73    1.272  0.30( 0.29) 0.97   17610.0   31400.00
      8    36799.88   61.91    1.169  0.30( 0.29) 0.96   22572.0   13100.00
      9    37598.15   69.02    1.121  0.30( 0.29) 0.96   25497.2   11801.00
     10    39149.57   79.76    1.048  0.30( 0.29) 0.97   30611.3   11530.00
     11    40036.90   84.10    1.019  0.30( 0.29) 0.97   33145.3   11701.00
     12    41191.95   89.38    0.983  0.30( 0.29) 0.97   36618.9   13010.00
     13    42928.20   97.63    0.946  0.30( 0.29) 0.97   42100.9   10800.00
     14    43433.59  101.85    0.928  0.30( 0.29) 0.97   45043.6   11130.00
     15    43084.26  111.44    0.886  0.30( 0.29) 0.98   50082.4   12410.00
     16    42482.45  119.74    0.850  0.30( 0.29) 0.98   53824.5   11201.00
```

```
    17    42036.99  124.70    0.839  0.30( 0.29) 0.98   55554.2   12201.00
    18    41017.74  131.76    0.825  0.30( 0.29) 0.98   57409.6   12231.00
    19    39725.14  139.59    0.809  0.30( 0.29) 0.98   59046.0   10400.00
    20    38382.80  147.54    0.792  0.30( 0.29) 0.98   60340.5   12010.00
    21    37213.00  153.53    0.780  0.30( 0.29) 0.98   60689.2   10210.00
    22    33071.82  181.77    0.723  0.30( 0.29) 0.98   61427.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      209.22   12.84    2.972  0.30( 0.30) 1.00      87.0   21100.00
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  13406.00 =    2859.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22709.72   12.84    2.972  0.30( 0.29) 0.98    3192.7   21100.00
      2    24994.14   19.27    2.264  0.30( 0.29) 0.97    4747.5   50600.00
      3    25817.83   22.11    2.076  0.30( 0.29) 0.97    5505.8   50500.00
      4    28088.40   29.68    1.726  0.30( 0.29) 0.97    7516.8   30600.00
      5    31022.61   37.56    1.517  0.30( 0.29) 0.97   10665.1   30200.00
      6    32551.54   41.93    1.422  0.30( 0.29) 0.97   12647.3   30110.00
      7    33820.33   45.96    1.356  0.30( 0.29) 0.97   14778.6   21400.00
      8    35041.14   51.73    1.272  0.30( 0.29) 0.97   17697.0   31400.00
      9    36867.93   61.91    1.169  0.30( 0.29) 0.96   22659.0   13100.00
     10    37662.43   69.02    1.121  0.30( 0.29) 0.96   25584.2   11801.00
     11    39208.16   79.76    1.048  0.30( 0.29) 0.97   30698.3   11530.00
     12    40093.19   84.10    1.019  0.30( 0.29) 0.97   33232.3   11701.00
     13    41245.45   89.38    0.983  0.30( 0.29) 0.97   36705.9   13010.00
     14    42978.78   97.63    0.946  0.30( 0.29) 0.97   42187.9   10800.00
     15    43482.74  101.85    0.928  0.30( 0.29) 0.97   45130.6   11130.00
     16    43130.15  111.44    0.886  0.30( 0.29) 0.98   50169.4   12410.00
     17    42525.52  119.74    0.850  0.30( 0.29) 0.98   53911.5   11201.00
     18    42079.21  124.70    0.839  0.30( 0.29) 0.98   55641.2   12201.00
     19    41058.82  131.76    0.825  0.30( 0.29) 0.98   57496.6   12231.00
     20    39764.95  139.59    0.809  0.30( 0.29) 0.98   59133.0   10400.00
     21    38421.34  147.54    0.792  0.30( 0.29) 0.98   60427.5   12010.00
     22    37250.57  153.53    0.780  0.30( 0.29) 0.98   60776.2   10210.00
     23    33104.95  181.77    0.723  0.30( 0.29) 0.98   61514.4   10100.00
    TOTAL AREA(ACRES) =     61514.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    43482.74  Tc(MIN.) =  101.847
  EFFECTIVE AREA(ACRES) =  45130.62  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61514.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13408.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    195.00  DOWNSTREAM(FEET) =    182.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2458.36   CHANNEL SLOPE =  0.0053
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.97
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.916
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       12.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   43486.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.55
  AVERAGE FLOW DEPTH(FEET) =  10.97   TRAVEL TIME(MIN.) =   2.64
  Tc(MIN.) =  104.48
  SUBAREA AREA(ACRES) =    12.41       SUBAREA RUNOFF(CFS) =    6.88
  EFFECTIVE AREA(ACRES) =  45143.03     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    61526.8         PEAK FLOW RATE(CFS) =   43482.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.97   FLOW VELOCITY(FEET/SEC.) =  15.55
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22709.72   16.10    2.536  0.30( 0.29) 0.98    3205.1   21100.00
      2    24994.14   22.42    2.058  0.30( 0.29) 0.97    4759.9   50600.00
      3    25817.83   25.24    1.897  0.30( 0.29) 0.97    5518.2   50500.00
      4    28088.40   32.71    1.643  0.30( 0.29) 0.97    7529.2   30600.00
      5    31022.61   40.50    1.445  0.30( 0.29) 0.97   10677.5   30200.00
      6    32551.54   44.82    1.375  0.30( 0.29) 0.97   12659.7   30110.00
      7    33820.33   48.82    1.310  0.30( 0.29) 0.97   14791.0   21400.00
      8    35041.14   54.56    1.241  0.30( 0.29) 0.97   17709.4   31400.00
      9    36867.93   64.69    1.150  0.30( 0.29) 0.96   22671.4   13100.00
     10    37662.43   71.78    1.102  0.30( 0.29) 0.96   25596.6   11801.00
     11    39208.16   82.48    1.030  0.30( 0.29) 0.97   30710.7   11530.00
     12    40093.19   86.80    1.001  0.30( 0.29) 0.97   33244.7   11701.00
     13    41245.45   92.06    0.970  0.30( 0.29) 0.97   36718.3   13010.00
     14    42978.78  100.28    0.934  0.30( 0.29) 0.97   42200.3   10800.00
     15    43482.74  104.48    0.916  0.30( 0.29) 0.97   45143.0   11130.00
     16    43130.15  114.08    0.875  0.30( 0.29) 0.98   50181.8   12410.00
     17    42525.52  122.39    0.844  0.30( 0.29) 0.98   53923.9   11201.00
     18    42079.21  127.37    0.834  0.30( 0.29) 0.98   55653.6   12201.00
     19    41058.82  134.45    0.819  0.30( 0.29) 0.98   57509.0   12231.00
     20    39764.95  142.30    0.803  0.30( 0.29) 0.98   59145.4   10400.00
     21    38421.34  150.28    0.786  0.30( 0.29) 0.98   60439.9   12010.00
     22    37250.57  156.30    0.774  0.30( 0.29) 0.98   60788.6   10210.00
     23    33104.95  184.65    0.720  0.30( 0.29) 0.98   61526.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   43482.74  Tc(MIN.) =  104.48
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   45143.03

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 FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610507X.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      406.61   19.94  0.30( 0.30) 0.99     236.8   50700.00
   TOTAL AREA(ACRES) =      236.8

****************************************************************************
 FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    22709.72   16.10    2.536  0.30( 0.29) 0.98    3205.1   21100.00
     2    24994.14   22.42    2.058  0.30( 0.29) 0.97    4759.9   50600.00
     3    25817.83   25.24    1.897  0.30( 0.29) 0.97    5518.2   50500.00
     4    28088.40   32.71    1.643  0.30( 0.29) 0.97    7529.2   30600.00
     5    31022.61   40.50    1.445  0.30( 0.29) 0.97   10677.5   30200.00
     6    32551.54   44.82    1.375  0.30( 0.29) 0.97   12659.7   30110.00
     7    33820.33   48.82    1.310  0.30( 0.29) 0.97   14791.0   21400.00
     8    35041.14   54.56    1.241  0.30( 0.29) 0.97   17709.4   31400.00
     9    36867.93   64.69    1.150  0.30( 0.29) 0.96   22671.4   13100.00
    10    37662.43   71.78    1.102  0.30( 0.29) 0.96   25596.6   11801.00
    11    39208.16   82.48    1.030  0.30( 0.29) 0.97   30710.7   11530.00
    12    40093.19   86.80    1.001  0.30( 0.29) 0.97   33244.7   11701.00
    13    41245.45   92.06    0.970  0.30( 0.29) 0.97   36718.3   13010.00
    14    42978.78  100.28    0.934  0.30( 0.29) 0.97   42200.3   10800.00
    15    43482.74  104.48    0.916  0.30( 0.29) 0.97   45143.0   11130.00
    16    43130.15  114.08    0.875  0.30( 0.29) 0.98   50181.8   12410.00
    17    42525.52  122.39    0.844  0.30( 0.29) 0.98   53923.9   11201.00
    18    42079.21  127.37    0.834  0.30( 0.29) 0.98   55653.6   12201.00
    19    41058.82  134.45    0.819  0.30( 0.29) 0.98   57509.0   12231.00
    20    39764.95  142.30    0.803  0.30( 0.29) 0.98   59145.4   10400.00
    21    38421.34  150.28    0.786  0.30( 0.29) 0.98   60439.9   12010.00
    22    37250.57  156.30    0.774  0.30( 0.29) 0.98   60788.6   10210.00
    23    33104.95  184.65    0.720  0.30( 0.29) 0.98   61526.8   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      406.61   19.94    2.206  0.30( 0.30) 0.99     236.8   50700.00
 LONGEST FLOWPATH FROM NODE  50700.00 TO NODE  13408.00 =    7903.00 FEET.

 ** PEAK FLOW RATE TABLE **
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  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    23094.70   16.10    2.536  0.30( 0.29) 0.98    3396.3   21100.00
     2    24504.60   19.94    2.206  0.30( 0.29) 0.98    4386.8   50700.00
     3    25369.23   22.42    2.058  0.30( 0.29) 0.98    4996.7   50600.00
     4    26158.60   25.24    1.897  0.30( 0.29) 0.98    5755.0   50500.00
     5    28375.10   32.71    1.643  0.30( 0.29) 0.98    7766.0   30600.00
     6    31267.06   40.50    1.445  0.30( 0.29) 0.97   10914.3   30200.00
     7    32781.07   44.82    1.375  0.30( 0.29) 0.97   12896.5   30110.00
     8    34036.06   48.82    1.310  0.30( 0.29) 0.97   15027.8   21400.00
     9    35242.21   54.56    1.241  0.30( 0.29) 0.97   17946.2   31400.00
    10    37049.60   64.69    1.150  0.30( 0.29) 0.96   22908.2   13100.00
    11    37833.88   71.78    1.102  0.30( 0.29) 0.96   25833.4   11801.00
    12    39364.17   82.48    1.030  0.30( 0.29) 0.97   30947.5   11530.00
    13    40242.98   86.80    1.001  0.30( 0.29) 0.97   33481.5   11701.00
    14    41388.72   92.06    0.970  0.30( 0.29) 0.97   36955.1   13010.00
    15    43114.46  100.28    0.934  0.30( 0.29) 0.97   42437.1   10800.00
    16    43614.54  104.48    0.916  0.30( 0.29) 0.97   45379.8   11130.00
    17    43253.09  114.08    0.875  0.30( 0.29) 0.98   50418.6   12410.00
    18    42641.94  122.39    0.844  0.30( 0.29) 0.98   54160.7   11201.00
    19    42193.44  127.37    0.834  0.30( 0.29) 0.98   55890.4   12201.00
    20    41169.93  134.45    0.819  0.30( 0.29) 0.98   57745.8   12231.00
    21    39872.60  142.30    0.803  0.30( 0.29) 0.98   59382.2   10400.00
    22    38525.47  150.28    0.786  0.30( 0.29) 0.98   60676.7   12010.00
    23    37352.05  156.30    0.774  0.30( 0.29) 0.98   61025.4   10210.00
    24    33194.95  184.65    0.720  0.30( 0.29) 0.98   61763.6   10100.00
   TOTAL AREA(ACRES) =     61763.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    43614.54  Tc(MIN.) =  104.483
 EFFECTIVE AREA(ACRES) =  45379.82  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    61763.6
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13408.00 TO NODE  13410.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    182.00  DOWNSTREAM(FEET) =    178.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =   952.73   CHANNEL SLOPE =  0.0034
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  12.39
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.911
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        3.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   43615.45
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.44
 AVERAGE FLOW DEPTH(FEET) =  12.39   TRAVEL TIME(MIN.) =   1.18
 Tc(MIN.) =  105.66
 SUBAREA AREA(ACRES) =     3.31       SUBAREA RUNOFF(CFS) =    1.82
```

EFFECTIVE AREA(ACRES) = 45383.12 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 61766.9 PEAK FLOW RATE(CFS) = 43614.54
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 12.39 FLOW VELOCITY(FEET/SEC.) = 13.44
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23094.70	17.55	2.411	0.30(0.29)	0.98	3399.6	21100.00
2	24504.60	21.36	2.120	0.30(0.29)	0.98	4390.1	50700.00
3	25369.23	23.83	1.975	0.30(0.29)	0.98	5000.0	50600.00
4	26158.60	26.63	1.843	0.30(0.29)	0.98	5758.3	50500.00
5	28375.10	34.07	1.608	0.30(0.29)	0.98	7769.3	30600.00
6	31267.06	41.82	1.424	0.30(0.29)	0.97	10917.6	30200.00
7	32781.07	46.12	1.354	0.30(0.29)	0.97	12899.8	30110.00
8	34036.06	50.10	1.290	0.30(0.29)	0.97	15031.1	21400.00
9	35242.21	55.82	1.228	0.30(0.29)	0.97	17949.5	31400.00
10	37049.60	65.93	1.142	0.30(0.29)	0.96	22911.5	13100.00
11	37833.88	73.01	1.094	0.30(0.29)	0.96	25836.7	11801.00
12	39364.17	83.70	1.022	0.30(0.29)	0.97	30950.8	11530.00
13	40242.98	88.01	0.992	0.30(0.29)	0.97	33484.8	11701.00
14	41388.72	93.26	0.965	0.30(0.29)	0.97	36958.4	13010.00
15	43114.46	101.46	0.929	0.30(0.29)	0.97	42440.4	10800.00
16	43614.54	105.66	0.911	0.30(0.29)	0.97	45383.1	11130.00
17	43253.09	115.27	0.870	0.30(0.29)	0.98	50421.9	12410.00
18	42641.94	123.58	0.842	0.30(0.29)	0.98	54164.0	11201.00
19	42193.44	128.56	0.831	0.30(0.29)	0.98	55893.7	12201.00
20	41169.93	135.65	0.817	0.30(0.29)	0.98	57749.1	12231.00
21	39872.60	143.52	0.800	0.30(0.29)	0.98	59385.5	10400.00
22	38525.47	151.51	0.784	0.30(0.29)	0.98	60680.0	12010.00
23	37352.05	157.54	0.771	0.30(0.29)	0.98	61028.7	10210.00
24	33194.95	185.94	0.719	0.30(0.29)	0.98	61766.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 43614.54 Tc(MIN.) = 105.66
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 45383.12

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S36.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2910.65	20.44	0.30(0.30)	0.99	1260.6	21000.00
2	2989.79	23.10	0.30(0.30)	0.99	1445.3	20810.00
3	3003.85	23.43	0.30(0.30)	0.99	1471.9	20900.00
4	3091.89	25.96	0.30(0.30)	0.99	1661.5	20800.00
5	3097.72	27.72	0.30(0.30)	0.99	1780.4	20700.00
6	3142.81	35.26	0.30(0.30)	0.99	2292.7	20600.00
7	3137.40	40.67	0.30(0.30)	0.99	2620.6	20500.00
8	3096.39	42.97	0.30(0.30)	0.99	2721.6	20400.00
9	3088.42	43.38	0.30(0.30)	0.99	2734.5	20300.00
10	3032.58	45.96	0.30(0.30)	0.99	2812.8	20210.00
11	3031.11	46.05	0.30(0.30)	0.99	2815.9	20200.00
12	2999.88	47.73	0.30(0.30)	0.99	2872.0	20100.00
13	2891.88	52.36	0.30(0.30)	0.98	3016.9	13600.00
14	2658.92	87.63	0.30(0.29)	0.98	4003.4	13510.00
15	2501.00	96.53	0.30(0.29)	0.97	4067.7	13500.00

TOTAL AREA(ACRES) = 4067.7

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23094.70	17.55	2.411	0.30(0.29)	0.98	3399.6	21100.00
2	24504.60	21.36	2.120	0.30(0.29)	0.98	4390.1	50700.00
3	25369.23	23.83	1.975	0.30(0.29)	0.98	5000.0	50600.00
4	26158.60	26.63	1.843	0.30(0.29)	0.98	5758.3	50500.00
5	28375.10	34.07	1.608	0.30(0.29)	0.98	7769.3	30600.00
6	31267.06	41.82	1.424	0.30(0.29)	0.97	10917.6	30200.00
7	32781.07	46.12	1.354	0.30(0.29)	0.97	12899.8	30110.00
8	34036.06	50.10	1.290	0.30(0.29)	0.97	15031.1	21400.00
9	35242.21	55.82	1.228	0.30(0.29)	0.97	17949.5	31400.00
10	37049.60	65.93	1.142	0.30(0.29)	0.96	22911.5	13100.00
11	37833.88	73.01	1.094	0.30(0.29)	0.96	25836.7	11801.00
12	39364.17	83.70	1.022	0.30(0.29)	0.97	30950.8	11530.00
13	40242.98	88.01	0.992	0.30(0.29)	0.97	33484.8	11701.00
14	41388.72	93.26	0.965	0.30(0.29)	0.97	36958.4	13010.00
15	43114.46	101.46	0.929	0.30(0.29)	0.97	42440.4	10800.00
16	43614.54	105.66	0.911	0.30(0.29)	0.97	45383.1	11130.00
17	43253.09	115.27	0.870	0.30(0.29)	0.98	50421.9	12410.00
18	42641.94	123.58	0.842	0.30(0.29)	0.98	54164.0	11201.00
19	42193.44	128.56	0.831	0.30(0.29)	0.98	55893.7	12201.00
20	41169.93	135.65	0.817	0.30(0.29)	0.98	57749.1	12231.00
21	39872.60	143.52	0.800	0.30(0.29)	0.98	59385.5	10400.00
22	38525.47	151.51	0.784	0.30(0.29)	0.98	60680.0	12010.00
23	37352.05	157.54	0.771	0.30(0.29)	0.98	61028.7	10210.00
24	33194.95	185.94	0.719	0.30(0.29)	0.98	61766.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2910.65	20.44	2.175	0.30(0.30)	0.99	1260.6	21000.00
2	2989.79	23.10	2.018	0.30(0.30)	0.99	1445.3	20810.00

3	3003.85	23.43	1.999	0.30(0.30)	0.99	1471.9	20900.00
4	3091.89	25.96	1.869	0.30(0.30)	0.99	1661.5	20800.00
5	3097.72	27.72	1.802	0.30(0.30)	0.99	1780.4	20700.00
6	3142.81	35.26	1.577	0.30(0.30)	0.99	2292.7	20600.00
7	3137.40	40.67	1.442	0.30(0.30)	0.99	2620.6	20500.00
8	3096.39	42.97	1.405	0.30(0.30)	0.99	2721.6	20400.00
9	3088.42	43.38	1.398	0.30(0.30)	0.99	2734.5	20300.00
10	3032.58	45.96	1.356	0.30(0.30)	0.99	2812.8	20210.00
11	3031.11	46.05	1.355	0.30(0.30)	0.99	2815.9	20200.00
12	2999.88	47.73	1.328	0.30(0.30)	0.99	2872.0	20100.00
13	2891.88	52.36	1.265	0.30(0.30)	0.98	3016.9	13600.00
14	2658.92	87.63	0.995	0.30(0.29)	0.98	4003.4	13510.00
15	2501.00	96.53	0.951	0.30(0.29)	0.97	4067.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25907.87	17.55	2.411	0.30(0.29)	0.98	4481.8	21100.00
2	27074.21	20.44	2.175	0.30(0.29)	0.98	5411.1	21000.00
3	27442.71	21.36	2.120	0.30(0.29)	0.98	5714.8	50700.00
4	28103.40	23.10	2.018	0.30(0.29)	0.98	6265.0	20810.00
5	28233.42	23.43	1.999	0.30(0.29)	0.98	6373.4	20900.00
6	28386.95	23.83	1.975	0.30(0.29)	0.98	6501.8	50600.00
7	29061.82	25.96	1.869	0.30(0.29)	0.98	7238.6	20800.00
8	29252.71	26.63	1.843	0.30(0.29)	0.98	7465.1	50500.00
9	29580.77	27.72	1.802	0.30(0.29)	0.98	7833.2	20700.00
10	31510.77	34.07	1.608	0.30(0.29)	0.98	9980.9	30600.00
11	31963.98	35.26	1.577	0.30(0.29)	0.98	10547.6	20600.00
12	33974.88	40.67	1.442	0.30(0.29)	0.98	13070.5	20500.00
13	34383.99	41.82	1.424	0.30(0.29)	0.98	13588.6	30200.00
14	34770.10	42.97	1.405	0.30(0.29)	0.98	14171.7	20400.00
15	34907.20	43.38	1.398	0.30(0.29)	0.97	14374.5	20300.00
16	35758.63	45.96	1.356	0.30(0.29)	0.97	15640.6	20210.00
17	35788.36	46.05	1.355	0.30(0.29)	0.97	15684.6	20200.00
18	35810.93	46.12	1.354	0.30(0.29)	0.97	15718.0	30110.00
19	36289.16	47.73	1.328	0.30(0.29)	0.97	16634.9	20100.00
20	36980.67	50.10	1.290	0.30(0.29)	0.97	17977.3	21400.00
21	37404.68	52.36	1.265	0.30(0.29)	0.97	19201.5	13600.00
22	38111.24	55.82	1.228	0.30(0.29)	0.97	21063.2	31400.00
23	39851.84	65.93	1.142	0.30(0.29)	0.97	26308.0	13100.00
24	40589.35	73.01	1.094	0.30(0.29)	0.97	29431.3	11801.00
25	42049.02	83.70	1.022	0.30(0.29)	0.97	34844.4	11530.00
26	42823.44	87.63	0.995	0.30(0.29)	0.97	37261.9	13510.00
27	42895.08	88.01	0.992	0.30(0.29)	0.97	37491.0	11701.00
28	43947.80	93.26	0.965	0.30(0.29)	0.97	41002.5	13010.00
29	44578.67	96.53	0.951	0.30(0.29)	0.97	43214.6	13500.00
30	45534.35	101.46	0.929	0.30(0.29)	0.97	46508.1	10800.00
31	45965.25	105.66	0.911	0.30(0.29)	0.97	49450.9	11130.00
32	45445.76	115.27	0.870	0.30(0.29)	0.98	54489.6	12410.00
33	44728.61	123.58	0.842	0.30(0.29)	0.98	58231.7	11201.00
34	44241.01	128.56	0.831	0.30(0.29)	0.98	59961.4	12201.00
35	43161.86	135.65	0.817	0.30(0.29)	0.98	61816.8	12231.00
36	41802.77	143.52	0.800	0.30(0.29)	0.98	63453.2	10400.00
37	40392.89	151.51	0.784	0.30(0.29)	0.98	64747.7	12010.00
38	39172.14	157.54	0.771	0.30(0.29)	0.98	65096.4	10210.00
39	34814.85	185.94	0.719	0.30(0.29)	0.98	65834.6	10100.00

TOTAL AREA(ACRES) = 65834.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 45965.25 Tc(MIN.) = 105.664
EFFECTIVE AREA(ACRES) = 49450.86 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 65834.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

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FLOW PROCESS FROM NODE 13410.00 TO NODE 13412.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 178.72 DOWNSTREAM(FEET) = 176.93
CHANNEL LENGTH THRU SUBAREA(FEET) = 169.78 CHANNEL SLOPE = 0.0105
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.33
CHANNEL FLOW THRU SUBAREA(CFS) = 45965.25
FLOW VELOCITY(FEET/SEC.) = 19.98 FLOW DEPTH(FEET) = 9.33
TRAVEL TIME(MIN.) = 0.14 Tc(MIN.) = 105.81
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25907.87	17.72	2.397	0.30(0.29)	0.98	4481.8	21100.00
2	27074.21	20.61	2.165	0.30(0.29)	0.98	5411.1	21000.00
3	27442.71	21.53	2.111	0.30(0.29)	0.98	5714.8	50700.00
4	28103.40	23.27	2.008	0.30(0.29)	0.98	6265.0	20810.00
5	28233.42	23.60	1.989	0.30(0.29)	0.98	6373.4	20900.00
6	28386.95	24.00	1.965	0.30(0.29)	0.98	6501.8	50600.00
7	29061.82	26.13	1.863	0.30(0.29)	0.98	7238.6	20800.00
8	29252.71	26.79	1.837	0.30(0.29)	0.98	7465.1	50500.00
9	29580.77	27.88	1.795	0.30(0.29)	0.98	7833.2	20700.00
10	31510.77	34.23	1.604	0.30(0.29)	0.98	9980.9	30600.00
11	31963.98	35.42	1.572	0.30(0.29)	0.98	10547.6	20600.00
12	33974.88	40.82	1.440	0.30(0.29)	0.98	13070.5	20500.00
13	34383.99	41.97	1.421	0.30(0.29)	0.98	13588.6	30200.00
14	34770.10	43.13	1.402	0.30(0.29)	0.98	14171.7	20400.00
15	34907.20	43.54	1.396	0.30(0.29)	0.97	14374.5	20300.00
16	35758.63	46.11	1.354	0.30(0.29)	0.97	15640.6	20210.00
17	35788.36	46.20	1.353	0.30(0.29)	0.97	15684.6	20200.00
18	35810.93	46.27	1.351	0.30(0.29)	0.97	15718.0	30110.00
19	36289.16	47.88	1.325	0.30(0.29)	0.97	16634.9	20100.00
20	36980.67	50.25	1.288	0.30(0.29)	0.97	17977.3	21400.00
21	37404.68	52.51	1.264	0.30(0.29)	0.97	19201.5	13600.00
22	38111.24	55.97	1.226	0.30(0.29)	0.97	21063.2	31400.00
23	39851.84	66.08	1.141	0.30(0.29)	0.97	26308.0	13100.00
24	40589.35	73.16	1.093	0.30(0.29)	0.97	29431.3	11801.00
25	42049.02	83.85	1.021	0.30(0.29)	0.97	34844.4	11530.00
26	42823.44	87.77	0.994	0.30(0.29)	0.97	37261.9	13510.00
27	42895.08	88.16	0.991	0.30(0.29)	0.97	37491.0	11701.00
28	43947.80	93.40	0.964	0.30(0.29)	0.97	41002.5	13010.00
29	44578.67	96.67	0.950	0.30(0.29)	0.97	43214.6	13500.00
30	45534.35	101.60	0.929	0.30(0.29)	0.97	46508.1	10800.00
31	45965.25	105.81	0.911	0.30(0.29)	0.97	49450.9	11130.00

32	45445.76	115.41	0.869	0.30(0.29)	0.98	54489.6	12410.00
33	44728.61	123.72	0.841	0.30(0.29)	0.98	58231.7	11201.00
34	44241.01	128.71	0.831	0.30(0.29)	0.98	59961.4	12201.00
35	43161.86	135.80	0.816	0.30(0.29)	0.98	61816.8	12231.00
36	41802.77	143.67	0.800	0.30(0.29)	0.98	63453.2	10400.00
37	40392.89	151.66	0.784	0.30(0.29)	0.98	64747.7	12010.00
38	39172.14	157.69	0.771	0.30(0.29)	0.98	65096.4	10210.00
39	34814.85	186.09	0.719	0.30(0.29)	0.98	65834.6	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 45965.25 Tc(MIN.) = 105.81
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 49450.86

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
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****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
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PEAK FLOWRATE TABLE FILE NAME: 0509101X.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	657.43	36.39	0.30(0.30)	1.00	585.7	10100.00

TOTAL AREA(ACRES) = 585.7

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25907.87	17.72	2.397	0.30(0.29)	0.98	4481.8	21100.00
2	27074.21	20.61	2.165	0.30(0.29)	0.98	5411.1	21000.00
3	27442.71	21.53	2.111	0.30(0.29)	0.98	5714.8	50700.00
4	28103.40	23.27	2.008	0.30(0.29)	0.98	6265.0	20810.00
5	28233.42	23.60	1.989	0.30(0.29)	0.98	6373.4	20900.00
6	28386.95	24.00	1.965	0.30(0.29)	0.98	6501.8	50600.00
7	29061.82	26.13	1.863	0.30(0.29)	0.98	7238.6	20800.00
8	29252.71	26.79	1.837	0.30(0.29)	0.98	7465.1	50500.00
9	29580.77	27.88	1.795	0.30(0.29)	0.98	7833.2	20700.00
10	31510.77	34.23	1.604	0.30(0.29)	0.98	9980.9	30600.00
11	31963.98	35.42	1.572	0.30(0.29)	0.98	10547.6	20600.00
12	33974.88	40.82	1.440	0.30(0.29)	0.98	13070.5	20500.00
13	34383.99	41.97	1.421	0.30(0.29)	0.98	13588.6	30200.00
14	34770.10	43.13	1.402	0.30(0.29)	0.98	14171.7	20400.00
15	34907.20	43.54	1.396	0.30(0.29)	0.97	14374.5	20300.00
16	35758.63	46.11	1.354	0.30(0.29)	0.97	15640.6	20210.00
17	35788.36	46.20	1.353	0.30(0.29)	0.97	15684.6	20200.00
18	35810.93	46.27	1.351	0.30(0.29)	0.97	15718.0	30110.00

19	36289.16	47.88	1.325	0.30(0.29)	0.97	16634.9	20100.00
20	36980.67	50.25	1.288	0.30(0.29)	0.97	17977.3	21400.00
21	37404.68	52.51	1.264	0.30(0.29)	0.97	19201.5	13600.00
22	38111.24	55.97	1.226	0.30(0.29)	0.97	21063.2	31400.00
23	39851.84	66.08	1.141	0.30(0.29)	0.97	26308.0	13100.00
24	40589.35	73.16	1.093	0.30(0.29)	0.97	29431.3	11801.00
25	42049.02	83.85	1.021	0.30(0.29)	0.97	34844.4	11530.00
26	42823.44	87.77	0.994	0.30(0.29)	0.97	37261.9	13510.00
27	42895.08	88.16	0.991	0.30(0.29)	0.97	37491.0	11701.00
28	43947.80	93.40	0.964	0.30(0.29)	0.97	41002.5	13010.00
29	44578.67	96.67	0.950	0.30(0.29)	0.97	43214.6	13500.00
30	45534.35	101.60	0.929	0.30(0.29)	0.97	46508.1	10800.00
31	45965.25	105.81	0.911	0.30(0.29)	0.97	49450.9	11130.00
32	45445.76	115.41	0.869	0.30(0.29)	0.98	54489.6	12410.00
33	44728.61	123.72	0.841	0.30(0.29)	0.98	58231.7	11201.00
34	44241.01	128.71	0.831	0.30(0.29)	0.98	59961.4	12201.00
35	43161.86	135.80	0.816	0.30(0.29)	0.98	61816.8	12231.00
36	41802.77	143.67	0.800	0.30(0.29)	0.98	63453.2	10400.00
37	40392.89	151.66	0.784	0.30(0.29)	0.98	64747.7	12010.00
38	39172.14	157.69	0.771	0.30(0.29)	0.98	65096.4	10210.00
39	34814.85	186.09	0.719	0.30(0.29)	0.98	65834.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	657.43	36.39	1.547	0.30(0.30)	1.00	585.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 14724.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26446.04	17.72	2.397	0.30(0.29)	0.98	4767.1	21100.00
2	27631.00	20.61	2.165	0.30(0.29)	0.98	5742.9	21000.00
3	28007.44	21.53	2.111	0.30(0.29)	0.98	6061.4	50700.00
4	28679.13	23.27	2.008	0.30(0.29)	0.98	6639.6	20810.00
5	28810.67	23.60	1.989	0.30(0.29)	0.98	6753.3	20900.00
6	28965.77	24.00	1.965	0.30(0.29)	0.98	6888.1	50600.00
7	29653.23	26.13	1.863	0.30(0.29)	0.98	7659.2	20800.00
8	29849.29	26.79	1.837	0.30(0.29)	0.98	7896.4	50500.00
9	30184.71	27.88	1.795	0.30(0.29)	0.98	8282.0	20700.00
10	32157.15	34.23	1.604	0.30(0.29)	0.98	10531.9	30600.00
11	32616.91	35.42	1.572	0.30(0.29)	0.98	11117.8	20600.00
12	32979.48	36.39	1.547	0.30(0.29)	0.98	11582.6	10100.00
13	34575.57	40.82	1.440	0.30(0.29)	0.98	13656.2	20500.00
14	34974.87	41.97	1.421	0.30(0.29)	0.98	14174.3	30200.00
15	35351.12	43.13	1.402	0.30(0.29)	0.98	14757.4	20400.00
16	35484.70	43.54	1.396	0.30(0.29)	0.98	14960.2	20300.00
17	36314.14	46.11	1.354	0.30(0.29)	0.97	16226.3	20210.00
18	36343.12	46.20	1.353	0.30(0.29)	0.97	16270.3	20200.00
19	36365.11	46.27	1.351	0.30(0.29)	0.97	16303.7	30110.00
20	36829.58	47.88	1.325	0.30(0.29)	0.97	17220.6	20100.00
21	37501.56	50.25	1.288	0.30(0.29)	0.97	18563.0	21400.00
22	37912.58	52.51	1.264	0.30(0.29)	0.97	19787.3	13600.00
23	38599.27	55.97	1.226	0.30(0.29)	0.97	21648.9	31400.00
24	40295.04	66.08	1.141	0.30(0.29)	0.97	26893.7	13100.00
25	41007.30	73.16	1.093	0.30(0.29)	0.97	30017.0	11801.00
26	42428.84	83.85	1.021	0.30(0.29)	0.97	35430.2	11530.00

27	43189.27	87.77	0.994	0.30(0.29)	0.97	37847.7	13510.00
28	43259.54	88.16	0.991	0.30(0.29)	0.97	38076.7	11701.00
29	44297.93	93.40	0.964	0.30(0.29)	0.97	41588.2	13010.00
30	44921.32	96.67	0.950	0.30(0.29)	0.97	43800.4	13500.00
31	45865.75	101.60	0.929	0.30(0.29)	0.97	47093.9	10800.00
32	46287.05	105.81	0.911	0.30(0.29)	0.97	50036.6	11130.00
33	45745.62	115.41	0.869	0.30(0.29)	0.98	55075.3	12410.00
34	45013.94	123.72	0.841	0.30(0.29)	0.98	58817.5	11201.00
35	44520.91	128.71	0.831	0.30(0.29)	0.98	60547.2	12201.00
36	43434.04	135.80	0.816	0.30(0.29)	0.98	62402.5	12231.00
37	42066.37	143.67	0.800	0.30(0.29)	0.98	64038.9	10400.00
38	40647.79	151.66	0.784	0.30(0.29)	0.98	65333.5	12010.00
39	39420.47	157.69	0.771	0.30(0.29)	0.98	65682.2	10210.00
40	35035.47	186.09	0.719	0.30(0.29)	0.98	66420.4	10100.00

TOTAL AREA(ACRES) = 66420.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 46287.05 Tc(MIN.) = 105.806
EFFECTIVE AREA(ACRES) = 50036.59 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 66420.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13700.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 176.93 DOWNSTREAM(FEET) = 173.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 260.10 CHANNEL SLOPE = 0.0151
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.45
CHANNEL FLOW THRU SUBAREA(CFS) = 46287.05
FLOW VELOCITY(FEET/SEC.) = 22.61 FLOW DEPTH(FEET) = 8.45
TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 106.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26446.04	17.95	2.377	0.30(0.29)	0.98	4767.1	21100.00
2	27631.00	20.84	2.152	0.30(0.29)	0.98	5742.9	21000.00
3	28007.44	21.76	2.097	0.30(0.29)	0.98	6061.4	50700.00
4	28679.13	23.49	1.995	0.30(0.29)	0.98	6639.6	20810.00
5	28810.67	23.82	1.975	0.30(0.29)	0.98	6753.3	20900.00
6	28965.77	24.22	1.952	0.30(0.29)	0.98	6888.1	50600.00
7	29653.23	26.35	1.854	0.30(0.29)	0.98	7659.2	20800.00
8	29849.29	27.02	1.829	0.30(0.29)	0.98	7896.4	50500.00
9	30184.71	28.10	1.787	0.30(0.29)	0.98	8282.0	20700.00
10	32157.15	34.45	1.598	0.30(0.29)	0.98	10531.9	30600.00
11	32616.91	35.64	1.567	0.30(0.29)	0.98	11117.8	20600.00
12	32979.48	36.60	1.542	0.30(0.29)	0.98	11582.6	10100.00
13	34575.57	41.03	1.436	0.30(0.29)	0.98	13656.2	20500.00
14	34974.87	42.18	1.418	0.30(0.29)	0.98	14174.3	30200.00
15	35351.12	43.34	1.399	0.30(0.29)	0.98	14757.4	20400.00
16	35484.70	43.75	1.392	0.30(0.29)	0.98	14960.2	20300.00

17	36314.14	46.32	1.351	0.30(0.29)	0.97	16226.3	20210.00
18	36343.12	46.41	1.349	0.30(0.29)	0.97	16270.3	20200.00
19	36365.11	46.48	1.348	0.30(0.29)	0.97	16303.7	30110.00
20	36829.58	48.09	1.322	0.30(0.29)	0.97	17220.6	20100.00
21	37501.56	50.46	1.286	0.30(0.29)	0.97	18563.0	21400.00
22	37912.58	52.72	1.261	0.30(0.29)	0.97	19787.3	13600.00
23	38599.27	56.17	1.224	0.30(0.29)	0.97	21648.9	31400.00
24	40295.04	66.28	1.140	0.30(0.29)	0.97	26893.7	13100.00
25	41007.30	73.36	1.092	0.30(0.29)	0.97	30017.0	11801.00
26	42428.84	84.05	1.019	0.30(0.29)	0.97	35430.2	11530.00
27	43189.27	87.97	0.993	0.30(0.29)	0.97	37847.7	13510.00
28	43259.54	88.35	0.990	0.30(0.29)	0.97	38076.7	11701.00
29	44297.93	93.60	0.963	0.30(0.29)	0.97	41588.2	13010.00
30	44921.32	96.87	0.949	0.30(0.29)	0.97	43800.4	13500.00
31	45865.75	101.79	0.928	0.30(0.29)	0.97	47093.9	10800.00
32	46287.05	106.00	0.910	0.30(0.29)	0.97	50036.6	11130.00
33	45745.62	115.60	0.868	0.30(0.29)	0.98	55075.3	12410.00
34	45013.94	123.92	0.841	0.30(0.29)	0.98	58817.5	11201.00
35	44520.91	128.90	0.831	0.30(0.29)	0.98	60547.2	12201.00
36	43434.04	135.99	0.816	0.30(0.29)	0.98	62402.5	12231.00
37	42066.37	143.86	0.800	0.30(0.29)	0.98	64038.9	10400.00
38	40647.79	151.86	0.783	0.30(0.29)	0.98	65333.5	12010.00
39	39420.47	157.89	0.771	0.30(0.29)	0.98	65682.2	10210.00
40	35035.47	186.30	0.718	0.30(0.29)	0.98	66420.4	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 46287.05 Tc(MIN.) = 106.00
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 50036.59

****
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610508X.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	219.66	20.77	0.30(0.30)	0.99	131.3	50800.00

TOTAL AREA(ACRES) = 131.3

****
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26446.04	17.95	2.377	0.30(0.29)	0.98	4767.1	21100.00
2	27631.00	20.84	2.152	0.30(0.29)	0.98	5742.9	21000.00

```
     3    28007.44   21.76    2.097  0.30( 0.29) 0.98    6061.4   50700.00
     4    28679.13   23.49    1.995  0.30( 0.29) 0.98    6639.6   20810.00
     5    28810.67   23.82    1.975  0.30( 0.29) 0.98    6753.3   20900.00
     6    28965.77   24.22    1.952  0.30( 0.29) 0.98    6888.1   50600.00
     7    29653.23   26.35    1.854  0.30( 0.29) 0.98    7659.2   20800.00
     8    29849.29   27.02    1.829  0.30( 0.29) 0.98    7896.4   50500.00
     9    30184.71   28.10    1.787  0.30( 0.29) 0.98    8282.0   20700.00
    10    32157.15   34.45    1.598  0.30( 0.29) 0.98   10531.9   30600.00
    11    32616.91   35.64    1.567  0.30( 0.29) 0.98   11117.8   20600.00
    12    32979.48   36.60    1.542  0.30( 0.29) 0.98   11582.6   10100.00
    13    34575.57   41.03    1.436  0.30( 0.29) 0.98   13656.2   20500.00
    14    34974.87   42.18    1.418  0.30( 0.29) 0.98   14174.3   30200.00
    15    35351.12   43.34    1.399  0.30( 0.29) 0.98   14757.4   20400.00
    16    35484.70   43.75    1.392  0.30( 0.29) 0.98   14960.2   20300.00
    17    36314.14   46.32    1.351  0.30( 0.29) 0.97   16226.3   20210.00
    18    36343.12   46.41    1.349  0.30( 0.29) 0.97   16270.3   20200.00
    19    36365.11   46.48    1.348  0.30( 0.29) 0.97   16303.7   30110.00
    20    36829.58   48.09    1.322  0.30( 0.29) 0.97   17220.6   20100.00
    21    37501.56   50.46    1.286  0.30( 0.29) 0.97   18563.0   21400.00
    22    37912.58   52.72    1.261  0.30( 0.29) 0.97   19787.3   13600.00
    23    38599.27   56.17    1.224  0.30( 0.29) 0.97   21648.9   31400.00
    24    40295.04   66.28    1.140  0.30( 0.29) 0.97   26893.7   13100.00
    25    41007.30   73.36    1.092  0.30( 0.29) 0.97   30017.0   11801.00
    26    42428.84   84.05    1.019  0.30( 0.29) 0.97   35430.2   11530.00
    27    43189.27   87.97    0.993  0.30( 0.29) 0.97   37847.7   13510.00
    28    43259.54   88.35    0.990  0.30( 0.29) 0.97   38076.7   11701.00
    29    44297.93   93.60    0.963  0.30( 0.29) 0.97   41588.2   13010.00
    30    44921.32   96.87    0.949  0.30( 0.29) 0.97   43800.4   13500.00
    31    45865.75  101.79    0.928  0.30( 0.29) 0.97   47093.9   10800.00
    32    46287.05  106.00    0.910  0.30( 0.29) 0.97   50036.6   11130.00
    33    45745.62  115.60    0.868  0.30( 0.29) 0.98   55075.3   12410.00
    34    45013.94  123.92    0.841  0.30( 0.29) 0.98   58817.5   11201.00
    35    44520.91  128.90    0.831  0.30( 0.29) 0.98   60547.2   12201.00
    36    43434.04  135.99    0.816  0.30( 0.29) 0.98   62402.5   12231.00
    37    42066.37  143.86    0.800  0.30( 0.29) 0.98   64038.9   10400.00
    38    40647.79  151.86    0.783  0.30( 0.29) 0.98   65333.5   12010.00
    39    39420.47  157.89    0.771  0.30( 0.29) 0.98   65682.2   10210.00
    40    35035.47  186.30    0.718  0.30( 0.29) 0.98   66420.4   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13700.00 =  124551.97 FEET.

** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      219.66   20.77    2.156  0.30( 0.30) 0.99     131.3   50800.00
LONGEST FLOWPATH FROM NODE  50800.00 TO NODE  13700.00 =    5946.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    26658.49   17.95    2.377  0.30( 0.29) 0.98    4880.6   21100.00
    2    27820.78   20.77    2.156  0.30( 0.29) 0.98    5849.6   50800.00
    3    27850.15   20.84    2.152  0.30( 0.29) 0.98    5874.2   21000.00
    4    28220.17   21.76    2.097  0.30( 0.29) 0.98    6192.7   50700.00
    5    28879.78   23.49    1.995  0.30( 0.29) 0.98    6770.8   20810.00
    6    29009.01   23.82    1.975  0.30( 0.29) 0.98    6884.5   20900.00
    7    29161.35   24.22    1.952  0.30( 0.29) 0.98    7019.4   50600.00
    8    29837.27   26.35    1.854  0.30( 0.29) 0.98    7790.5   20800.00
    9    30030.29   27.02    1.829  0.30( 0.29) 0.98    8027.7   50500.00
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    10    30360.77   28.10    1.787  0.30( 0.29) 0.98    8413.3   20700.00
    11    32310.90   34.45    1.598  0.30( 0.29) 0.98   10663.2   30600.00
    12    32766.98   35.64    1.567  0.30( 0.29) 0.98   11249.1   20600.00
    13    33126.59   36.60    1.542  0.30( 0.29) 0.98   11713.8   10100.00
    14    34710.22   41.03    1.436  0.30( 0.29) 0.98   13787.5   20500.00
    15    35107.32   42.18    1.418  0.30( 0.29) 0.98   14305.6   30200.00
    16    35481.37   43.34    1.399  0.30( 0.29) 0.98   14888.7   20400.00
    17    35614.16   43.75    1.392  0.30( 0.29) 0.98   15091.5   20300.00
    18    36438.68   46.32    1.351  0.30( 0.29) 0.97   16357.6   20210.00
    19    36467.48   46.41    1.349  0.30( 0.29) 0.97   16401.6   20200.00
    20    36489.34   46.48    1.348  0.30( 0.29) 0.97   16435.0   30110.00
    21    36950.73   48.09    1.322  0.30( 0.29) 0.97   17351.9   20100.00
    22    37618.46   50.46    1.286  0.30( 0.29) 0.97   18694.3   21400.00
    23    38026.57   52.72    1.261  0.30( 0.29) 0.97   19918.5   13600.00
    24    38708.80   56.17    1.224  0.30( 0.29) 0.97   21780.2   31400.00
    25    40394.63   66.28    1.140  0.30( 0.29) 0.97   27025.0   13100.00
    26    41101.24   73.36    1.092  0.30( 0.29) 0.97   30148.3   11801.00
    27    42514.23   84.05    1.019  0.30( 0.29) 0.97   35561.4   11530.00
    28    43271.53   87.97    0.993  0.30( 0.29) 0.97   37978.9   13510.00
    29    43341.49   88.35    0.990  0.30( 0.29) 0.97   38208.0   11701.00
    30    44376.72   93.60    0.963  0.30( 0.29) 0.97   41719.5   13010.00
    31    44998.43   96.87    0.949  0.30( 0.29) 0.97   43931.6   13500.00
    32    45940.34  101.79    0.928  0.30( 0.29) 0.97   47225.1   10800.00
    33    46359.49  106.00    0.910  0.30( 0.29) 0.97   50167.9   11130.00
    34    45813.15  115.60    0.868  0.30( 0.29) 0.98   55206.6   12410.00
    35    45078.25  123.92    0.841  0.30( 0.29) 0.98   58948.7   11201.00
    36    44584.01  128.90    0.831  0.30( 0.29) 0.98   60678.4   12201.00
    37    43495.41  135.99    0.816  0.30( 0.29) 0.98   62533.8   12231.00
    38    42125.82  143.86    0.800  0.30( 0.29) 0.98   64170.2   10400.00
    39    40705.29  151.86    0.783  0.30( 0.29) 0.98   65464.7   12010.00
    40    39476.49  157.89    0.771  0.30( 0.29) 0.98   65813.4   10210.00
    41    35085.31  186.30    0.718  0.30( 0.29) 0.98   66551.6   10100.00
  TOTAL AREA(ACRES) =     66551.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    46359.49  Tc(MIN.) =  105.997
 EFFECTIVE AREA(ACRES) =  50167.86  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    66551.6
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13700.00 =  124551.97 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =    66551.6  TC(MIN.) =    106.00
 EFFECTIVE AREA(ACRES) =  50167.86  AREA-AVERAGED Fm(INCH/HR)=  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.974
 PEAK FLOW RATE(CFS)   =   46359.49

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    26658.49   17.95    2.377  0.30( 0.29) 0.98    4880.6   21100.00
     2    27820.78   20.77    2.156  0.30( 0.29) 0.98    5849.6   50800.00
     3    27850.15   20.84    2.152  0.30( 0.29) 0.98    5874.2   21000.00
     4    28220.17   21.76    2.097  0.30( 0.29) 0.98    6192.7   50700.00
     5    28879.78   23.49    1.995  0.30( 0.29) 0.98    6770.8   20810.00
     6    29009.01   23.82    1.975  0.30( 0.29) 0.98    6884.5   20900.00
     7    29161.35   24.22    1.952  0.30( 0.29) 0.98    7019.4   50600.00
     8    29837.27   26.35    1.854  0.30( 0.29) 0.98    7790.5   20800.00
```

9	30030.29	27.02	1.829	0.30(0.29)	0.98	8027.7	50500.00
10	30360.77	28.10	1.787	0.30(0.29)	0.98	8413.3	20700.00
11	32310.90	34.45	1.598	0.30(0.29)	0.98	10663.2	30600.00
12	32766.98	35.64	1.567	0.30(0.29)	0.98	11249.1	20600.00
13	33126.59	36.60	1.542	0.30(0.29)	0.98	11713.8	10100.00
14	34710.22	41.03	1.436	0.30(0.29)	0.98	13787.5	20500.00
15	35107.32	42.18	1.418	0.30(0.29)	0.98	14305.6	30200.00
16	35481.37	43.34	1.399	0.30(0.29)	0.98	14888.7	20400.00
17	35614.16	43.75	1.392	0.30(0.29)	0.98	15091.5	20300.00
18	36438.68	46.32	1.351	0.30(0.29)	0.97	16357.6	20210.00
19	36467.48	46.41	1.349	0.30(0.29)	0.97	16401.6	20200.00
20	36489.34	46.48	1.348	0.30(0.29)	0.97	16435.0	30110.00
21	36950.73	48.09	1.322	0.30(0.29)	0.97	17351.9	20100.00
22	37618.46	50.46	1.286	0.30(0.29)	0.97	18694.3	21400.00
23	38026.57	52.72	1.261	0.30(0.29)	0.97	19918.5	13600.00
24	38708.80	56.17	1.224	0.30(0.29)	0.97	21780.2	31400.00
25	40394.63	66.28	1.140	0.30(0.29)	0.97	27025.0	13100.00
26	41101.24	73.36	1.092	0.30(0.29)	0.97	30148.3	11801.00
27	42514.23	84.05	1.019	0.30(0.29)	0.97	35561.4	11530.00
28	43271.53	87.97	0.993	0.30(0.29)	0.97	37978.9	13510.00
29	43341.49	88.35	0.990	0.30(0.29)	0.97	38208.0	11701.00
30	44376.72	93.60	0.963	0.30(0.29)	0.97	41719.5	13010.00
31	44998.43	96.87	0.949	0.30(0.29)	0.97	43931.6	13500.00
32	45940.34	101.79	0.928	0.30(0.29)	0.97	47225.1	10800.00
33	46359.49	106.00	0.910	0.30(0.29)	0.97	50167.9	11130.00
34	45813.15	115.60	0.868	0.30(0.29)	0.98	55206.6	12410.00
35	45078.25	123.92	0.841	0.30(0.29)	0.98	58948.7	11201.00
36	44584.01	128.90	0.831	0.30(0.29)	0.98	60678.4	12201.00
37	43495.41	135.99	0.816	0.30(0.29)	0.98	62533.8	12231.00
38	42125.82	143.86	0.800	0.30(0.29)	0.98	64170.2	10400.00
39	40705.29	151.86	0.783	0.30(0.29)	0.98	65464.7	12010.00
40	39476.49	157.89	0.771	0.30(0.29)	0.98	65813.4	10210.00
41	35085.31	186.30	0.718	0.30(0.29)	0.98	66551.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S35.DAT
  TIME/DATE OF STUDY: 11:59 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.440
   2)   10.00;  3.011
   3)   15.00;  2.390
   4)   20.00;  2.029
   5)   25.00;  1.787
   6)   30.00;  1.600
   7)   40.00;  1.368
   8)   50.00;  1.205
   9)   60.00;  1.060
  10)   90.00;  0.862
  11)  120.00;  0.732
  12)  180.00;  0.593
  13)  360.00;  0.412
  14) 1440.00;  0.172
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13500.00 TO NODE  13500.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   548.43
  ELEVATION DATA: UPSTREAM(FEET) =   1183.47  DOWNSTREAM(FEET) =   1065.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.955
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.768
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        5.11      0.30     1.000     0   11.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.35
  TOTAL AREA(ACRES) =      5.11   PEAK FLOW RATE(CFS) =     11.35

**************************************************************************
  FLOW PROCESS FROM NODE  13500.50 TO NODE  13501.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1065.00  DOWNSTREAM(FEET) =   1033.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =   431.71   CHANNEL SLOPE =  0.0738
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.538
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.88
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   1.86
  Tc(MIN.) =   13.81
  SUBAREA AREA(ACRES) =     8.87       SUBAREA RUNOFF(CFS) =   17.86
  EFFECTIVE AREA(ACRES) =     13.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.0          PEAK FLOW RATE(CFS) =      28.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   4.33
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13501.00 =     980.14 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13501.00 TO NODE  13502.00 IS CODE =  56
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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1033.15  DOWNSTREAM(FEET) =    990.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.63   CHANNEL SLOPE =  0.0452
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.88
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.207
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.25
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   3.72
  Tc(MIN.) =   17.54
  SUBAREA AREA(ACRES) =    16.82       SUBAREA RUNOFF(CFS) =   28.87
  EFFECTIVE AREA(ACRES) =     30.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       30.8         PEAK FLOW RATE(CFS) =      52.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   4.55
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13502.00 =    1928.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13502.00 TO NODE  13503.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.26  DOWNSTREAM(FEET) =    956.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.98   CHANNEL SLOPE =  0.0363
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.997
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      88.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.01
  AVERAGE FLOW DEPTH(FEET) =   1.38   TRAVEL TIME(MIN.) =   3.13
  Tc(MIN.) =   20.67
  SUBAREA AREA(ACRES) =    46.02       SUBAREA RUNOFF(CFS) =   70.28
  EFFECTIVE AREA(ACRES) =     76.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.8         PEAK FLOW RATE(CFS) =     117.31
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.62   FLOW VELOCITY(FEET/SEC.) =   5.46
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13503.00 =    2869.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13503.00 TO NODE  13504.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    956.06  DOWNSTREAM(FEET) =    889.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2131.31   CHANNEL SLOPE =  0.0312
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.02
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.713
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.62
  AVERAGE FLOW DEPTH(FEET) =   1.97   TRAVEL TIME(MIN.) =   6.32
  Tc(MIN.) =   26.98
  SUBAREA AREA(ACRES) =    58.46       SUBAREA RUNOFF(CFS) =   74.34
  EFFECTIVE AREA(ACRES) =    135.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      135.3         PEAK FLOW RATE(CFS) =     172.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.09   FLOW VELOCITY(FEET/SEC.) =   5.81
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13504.00 =    5001.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13504.00 TO NODE  13505.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    889.48  DOWNSTREAM(FEET) =    848.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1661.97   CHANNEL SLOPE =  0.0249
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.43
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.555
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       49.30      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     199.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.60
  AVERAGE FLOW DEPTH(FEET) =   2.41   TRAVEL TIME(MIN.) =   4.94
  Tc(MIN.) =   31.93
  SUBAREA AREA(ACRES) =    49.30       SUBAREA RUNOFF(CFS) =   55.70
  EFFECTIVE AREA(ACRES) =    184.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      184.6         PEAK FLOW RATE(CFS) =     208.55
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.46   FLOW VELOCITY(FEET/SEC.) =   5.68
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.00 =    6663.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.00 TO NODE  13505.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    848.10  DOWNSTREAM(FEET) =    811.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1234.61   CHANNEL SLOPE =  0.0300
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.479
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.35      0.30     0.811     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.811
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     230.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.23
  AVERAGE FLOW DEPTH(FEET) =   2.47   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   35.23
  SUBAREA AREA(ACRES) =    39.35       SUBAREA RUNOFF(CFS) =   43.75
  EFFECTIVE AREA(ACRES) =    223.93     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      223.9         PEAK FLOW RATE(CFS) =     239.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.52   FLOW VELOCITY(FEET/SEC.) =   6.31
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.50 =    7897.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.50 TO NODE  13506.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    811.10  DOWNSTREAM(FEET) =    781.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1415.98   CHANNEL SLOPE =  0.0213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.93
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.384
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.33      0.30     0.738     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.738
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     267.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.76
  AVERAGE FLOW DEPTH(FEET) =   2.93   TRAVEL TIME(MIN.) =   4.10
  Tc(MIN.) =   39.33
  SUBAREA AREA(ACRES) =    54.33       SUBAREA RUNOFF(CFS) =   56.83
  EFFECTIVE AREA(ACRES) =    278.26     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =      278.3         PEAK FLOW RATE(CFS) =     277.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.99   FLOW VELOCITY(FEET/SEC.) =   5.81
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.00 =    9313.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13506.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    781.00  DOWNSTREAM(FEET) =    743.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1542.62   CHANNEL SLOPE =  0.0245
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.04
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.312
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.33      0.30     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     306.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.30
  AVERAGE FLOW DEPTH(FEET) =   3.03   TRAVEL TIME(MIN.) =   4.08
  Tc(MIN.) =   43.41
  SUBAREA AREA(ACRES) =    61.33       SUBAREA RUNOFF(CFS) =   59.48
  EFFECTIVE AREA(ACRES) =    339.59     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =      339.6         PEAK FLOW RATE(CFS) =     318.89
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.09
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.09   FLOW VELOCITY(FEET/SEC.) =   6.36
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.50 =   10856.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.50 TO NODE  13520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    743.17  DOWNSTREAM(FEET) =    717.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1370.93   CHANNEL SLOPE =  0.0191
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.41
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.249
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.86      0.30     0.848     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.848
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     336.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.90
  AVERAGE FLOW DEPTH(FEET) =   3.40   TRAVEL TIME(MIN.) =   3.87
  Tc(MIN.) =   47.28
  SUBAREA AREA(ACRES) =    39.86       SUBAREA RUNOFF(CFS) =   35.69
  EFFECTIVE AREA(ACRES) =    379.45     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =      379.5         PEAK FLOW RATE(CFS) =     335.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.39   FLOW VELOCITY(FEET/SEC.) =   5.89
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   47.28
  RAINFALL INTENSITY(INCH/HR) =   1.25
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     379.45
  TOTAL STREAM AREA(ACRES) =     379.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     335.29

****************************************************************************
  FLOW PROCESS FROM NODE  13510.00 TO NODE  13511.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```



```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   903.68
  ELEVATION DATA: UPSTREAM(FEET) =   1216.90  DOWNSTREAM(FEET) =   1022.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.615
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.438
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.30     1.000     0   14.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.81
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =     12.81

****************************************************************************
  FLOW PROCESS FROM NODE  13511.00 TO NODE  13512.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1022.78  DOWNSTREAM(FEET) =    954.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1027.63   CHANNEL SLOPE =  0.0667
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.142
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       25.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.48
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   18.44
  SUBAREA AREA(ACRES) =    25.40       SUBAREA RUNOFF(CFS) =   42.11
  EFFECTIVE AREA(ACRES) =     32.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       32.1         PEAK FLOW RATE(CFS) =      53.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   5.22
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13512.00 =    1931.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13512.00 TO NODE  13513.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    954.27  DOWNSTREAM(FEET) =    872.45
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.42   CHANNEL SLOPE =  0.0425
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.835
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       90.23      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     115.76
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.76
 AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   5.58
 Tc(MIN.) =   24.02
 SUBAREA AREA(ACRES) =    90.23       SUBAREA RUNOFF(CFS) =  124.63
 EFFECTIVE AREA(ACRES) =    122.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      122.3         PEAK FLOW RATE(CFS) =     168.91
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.90   FLOW VELOCITY(FEET/SEC.) =   6.43
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13513.00 =    3857.73 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13513.00 TO NODE  13514.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    872.45  DOWNSTREAM(FEET) =    813.12
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1895.66   CHANNEL SLOPE =  0.0313
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.62
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.642
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      135.65      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     250.96
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.49
 AVERAGE FLOW DEPTH(FEET) =   2.56   TRAVEL TIME(MIN.) =   4.87
 Tc(MIN.) =   28.89
 SUBAREA AREA(ACRES) =   135.65       SUBAREA RUNOFF(CFS) =  163.81
 EFFECTIVE AREA(ACRES) =    257.94     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      257.9         PEAK FLOW RATE(CFS) =     311.48
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.87
```



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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.87   FLOW VELOCITY(FEET/SEC.) =   6.91
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13514.00 =    5753.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13514.00 TO NODE  13515.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    813.12  DOWNSTREAM(FEET) =    773.74
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.15   CHANNEL SLOPE =  0.0204
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.54
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.506
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      109.30      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     370.83
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.22
 AVERAGE FLOW DEPTH(FEET) =   3.51   TRAVEL TIME(MIN.) =   5.16
 Tc(MIN.) =   34.05
 SUBAREA AREA(ACRES) =   109.30       SUBAREA RUNOFF(CFS) =  118.64
 EFFECTIVE AREA(ACRES) =    367.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      367.2         PEAK FLOW RATE(CFS) =     398.63
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.64

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.64   FLOW VELOCITY(FEET/SEC.) =   6.33
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13515.00 =    7679.54 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    773.74  DOWNSTREAM(FEET) =    717.04
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2279.49   CHANNEL SLOPE =  0.0249
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.98
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.385
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      231.44      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     511.73
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.29
```

```
  AVERAGE FLOW DEPTH(FEET) =   3.93   TRAVEL TIME(MIN.) =   5.21
  Tc(MIN.) =   39.27
  SUBAREA AREA(ACRES) =   231.44       SUBAREA RUNOFF(CFS) =  226.02
  EFFECTIVE AREA(ACRES) =    598.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      598.7         PEAK FLOW RATE(CFS) =     584.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.21   FLOW VELOCITY(FEET/SEC.) =   7.55
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13520.00 =    9959.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   39.27
  RAINFALL INTENSITY(INCH/HR) =   1.39
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     598.68
  TOTAL STREAM AREA(ACRES) =     598.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     584.67

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      335.29   47.28    1.249  0.30( 0.27) 0.89     379.5   13500.00
      2      584.67   39.27    1.385  0.30( 0.30) 1.00     598.7   13510.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      901.61   39.27    1.385  0.30( 0.29) 0.96     913.8   13510.00
      2      846.82   47.28    1.249  0.30( 0.29) 0.96     978.1   13500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     901.61    Tc(MIN.) =    39.27
  EFFECTIVE AREA(ACRES) =     913.79   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =      978.1
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13520.00 TO NODE  13520.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    717.04  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.22   CHANNEL SLOPE =  0.0084
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.61
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.299
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.31      0.30     0.965     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.965
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     989.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.74
  AVERAGE FLOW DEPTH(FEET) =   3.60   TRAVEL TIME(MIN.) =   4.99
  Tc(MIN.) =   44.25
  SUBAREA AREA(ACRES) =   193.31       SUBAREA RUNOFF(CFS) =  175.58
  EFFECTIVE AREA(ACRES) =   1107.10     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     1171.4         PEAK FLOW RATE(CFS) =    1006.14
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.63   FLOW VELOCITY(FEET/SEC.) =   6.78
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.50 =   14246.39 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1006.14   44.25    1.299  0.30( 0.29) 0.96    1107.1   13510.00
      2      930.80   52.38    1.171  0.30( 0.29) 0.96    1171.4   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1006.14  Tc(MIN.) =   44.25
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1107.10

****************************************************************************
  FLOW PROCESS FROM NODE  13520.50 TO NODE  13521.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    661.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1622.36   CHANNEL SLOPE =  0.0235
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.82
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.254
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.79      0.30     0.897     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.897
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1063.65
```

```
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.82
 AVERAGE FLOW DEPTH(FEET) =   2.82   TRAVEL TIME(MIN.) =   2.75
 Tc(MIN.) =   47.01
 SUBAREA AREA(ACRES) =   129.79       SUBAREA RUNOFF(CFS) =  115.02
 EFFECTIVE AREA(ACRES) =   1236.89     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     1301.2         PEAK FLOW RATE(CFS) =    1076.42
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.84   FLOW VELOCITY(FEET/SEC.) =   9.86
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13521.00 =   15868.75 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1076.42   47.01    1.254  0.30( 0.29) 0.96    1236.9   13510.00
     2      988.17   55.20    1.130  0.30( 0.29) 0.95    1301.2   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1076.42  Tc(MIN.) =   47.01
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1236.89

****************************************************************************
 FLOW PROCESS FROM NODE  13521.00 TO NODE  13522.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    661.95  DOWNSTREAM(FEET) =    632.19
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2746.01   CHANNEL SLOPE =  0.0108
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.73
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.163
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      278.60      0.30     0.905     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.905
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1188.23
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.78
 AVERAGE FLOW DEPTH(FEET) =   3.71   TRAVEL TIME(MIN.) =   5.88
 Tc(MIN.) =   52.89
 SUBAREA AREA(ACRES) =   278.60       SUBAREA RUNOFF(CFS) =  223.58
 EFFECTIVE AREA(ACRES) =   1515.49     AREA-AVERAGED Fm(INCH/HR) =   0.28
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
 TOTAL AREA(ACRES) =     1579.8         PEAK FLOW RATE(CFS) =    1199.12
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.73

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.73   FLOW VELOCITY(FEET/SEC.) =   7.81
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13522.00 =   18614.76 FEET.
```



```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1199.12   52.89    1.163  0.30( 0.28) 0.95    1515.5   13510.00
     2     1092.65   61.25    1.052  0.30( 0.28) 0.94    1579.8   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1199.12  Tc(MIN.) =   52.89
 AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1515.49
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     1579.8  TC(MIN.) =     52.89
 EFFECTIVE AREA(ACRES) =   1515.49  AREA-AVERAGED Fm(INCH/HR)=  0.28
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.947
 PEAK FLOW RATE(CFS)   =    1199.12

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1199.12   52.89    1.163  0.30( 0.28) 0.95    1515.5   13510.00
     2     1092.65   61.25    1.052  0.30( 0.28) 0.94    1579.8   13500.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S36.DAT
  TIME/DATE OF STUDY: 09:52 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.255
   2)   10.00;  3.396
   3)   15.00;  2.615
   4)   20.00;  2.190
   5)   25.00;  1.899
   6)   30.00;  1.707
   7)   40.00;  1.447
   8)   50.00;  1.285
   9)   60.00;  1.174
  10)   90.00;  0.972
  11)  120.00;  0.842
  12)  180.00;  0.717
  13)  360.00;  0.527
  14) 1200.00;  0.230
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13600.00 TO NODE  13600.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   488.61
  ELEVATION DATA: UPSTREAM(FEET) =    872.12  DOWNSTREAM(FEET) =    744.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.995
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.241
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        3.39      0.30     1.000     0   11.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.97
  TOTAL AREA(ACRES) =      3.39   PEAK FLOW RATE(CFS) =      8.97

**************************************************************************
  FLOW PROCESS FROM NODE  13600.50 TO NODE  13601.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    744.80  DOWNSTREAM(FEET) =    707.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =   418.30   CHANNEL SLOPE =  0.0896
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.43
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.962
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.91
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   1.78
  Tc(MIN.) =   12.78
  SUBAREA AREA(ACRES) =     7.45       SUBAREA RUNOFF(CFS) =   17.85
  EFFECTIVE AREA(ACRES) =     10.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       10.8          PEAK FLOW RATE(CFS) =      25.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   4.49
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13601.00 =     906.91 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13601.00 TO NODE  13602.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    707.32  DOWNSTREAM(FEET) =    657.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   777.60   CHANNEL SLOPE =  0.0646
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.596
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.29
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   2.45
  Tc(MIN.) =   15.23
  SUBAREA AREA(ACRES) =    30.96       SUBAREA RUNOFF(CFS) =   63.97
  EFFECTIVE AREA(ACRES) =     41.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.8         PEAK FLOW RATE(CFS) =      86.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.16   FLOW VELOCITY(FEET/SEC.) =   6.03
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13602.00 =    1684.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13602.00 TO NODE  13603.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.12  DOWNSTREAM(FEET) =    584.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1186.54   CHANNEL SLOPE =  0.0611
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.36
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.331
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     107.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.35
  AVERAGE FLOW DEPTH(FEET) =   1.34   TRAVEL TIME(MIN.) =   3.11
  Tc(MIN.) =   18.34
  SUBAREA AREA(ACRES) =    23.36       SUBAREA RUNOFF(CFS) =   42.70
  EFFECTIVE AREA(ACRES) =     65.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       65.2         PEAK FLOW RATE(CFS) =     119.11
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =   6.56
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13603.00 =    2871.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.58  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   860.98   CHANNEL SLOPE =  0.0461
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.67
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.152
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     136.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.22
  AVERAGE FLOW DEPTH(FEET) =   1.65   TRAVEL TIME(MIN.) =   2.31
  Tc(MIN.) =   20.65
  SUBAREA AREA(ACRES) =    21.24       SUBAREA RUNOFF(CFS) =   35.41
  EFFECTIVE AREA(ACRES) =     86.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       86.4         PEAK FLOW RATE(CFS) =     144.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.70   FLOW VELOCITY(FEET/SEC.) =   6.30
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S35.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1199.12   52.89  0.30( 0.28) 0.95    1515.5   13510.00
```

```
      2     1092.65   61.25  0.30( 0.28) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =     1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1199.12   52.89  0.30( 0.28) 0.95    1515.5   13510.00
      2     1092.65   61.25  0.30( 0.28) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =      1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13523.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    632.19  DOWNSTREAM(FEET) =    561.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1151.68   CHANNEL SLOPE =  0.0618
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.29
  CHANNEL FLOW THRU SUBAREA(CFS) =    1199.12
  FLOW VELOCITY(FEET/SEC.) =  14.18   FLOW DEPTH(FEET) =   2.29
  TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =   54.24
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1301.13   54.24    1.238  0.30( 0.28) 0.95    1515.5   13510.00
      2     1241.13   62.65    1.156  0.30( 0.28) 0.94    1579.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1301.13  Tc(MIN.) =   54.24
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1515.49

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610201X.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       82.13   14.42  0.30( 0.30) 1.00      37.9   20100.00
```



```
    TOTAL AREA(ACRES) =       37.9

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1301.13   54.24    1.238  0.30( 0.28) 0.95    1515.5   13510.00
      2     1241.13   62.65    1.156  0.30( 0.28) 0.94    1579.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       82.13   14.42    2.705  0.30( 0.30) 1.00      37.9   20100.00
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  13523.00 =    2767.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      960.21   14.42    2.705  0.30( 0.29) 0.95     440.9   20100.00
      2     1333.15   54.24    1.238  0.30( 0.28) 0.95    1553.4   13510.00
      3     1270.36   62.65    1.156  0.30( 0.28) 0.95    1617.8   13500.00
    TOTAL AREA(ACRES) =      1617.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1333.15  Tc(MIN.) =   54.242
  EFFECTIVE AREA(ACRES) =   1553.43  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1617.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13524.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    561.00  DOWNSTREAM(FEET) =    556.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   238.34   CHANNEL SLOPE =  0.0210
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.30
  CHANNEL FLOW THRU SUBAREA(CFS) =    1333.15
  FLOW VELOCITY(FEET/SEC.) =  10.13   FLOW DEPTH(FEET) =   3.30
  TRAVEL TIME(MIN.) =   0.39   Tc(MIN.) =   54.63
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      960.21   14.86    2.638  0.30( 0.29) 0.95     440.9   20100.00
      2     1333.15   54.63    1.234  0.30( 0.28) 0.95    1553.4   13510.00
      3     1270.36   63.04    1.154  0.30( 0.28) 0.95    1617.8   13500.00
```

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1333.15  Tc(MIN.) =   54.63
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1553.43

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610202X.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       68.24   13.11  0.30( 0.30) 1.00      29.0   20210.00
      2       68.04   13.20  0.30( 0.30) 1.00      29.1   20200.00
    TOTAL AREA(ACRES) =       29.1

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      960.21   14.86    2.638  0.30( 0.29) 0.95     440.9   20100.00
      2     1333.15   54.63    1.234  0.30( 0.28) 0.95    1553.4   13510.00
      3     1270.36   63.04    1.154  0.30( 0.28) 0.95    1617.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       68.24   13.11    2.910  0.30( 0.30) 1.00      29.0   20210.00
      2       68.04   13.20    2.896  0.30( 0.30) 1.00      29.1   20200.00
  LONGEST FLOWPATH FROM NODE  20210.00 TO NODE  13524.00 =    2247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1013.84   13.11    2.910  0.30( 0.29) 0.95     418.1   20210.00
      2     1015.03   13.20    2.896  0.30( 0.29) 0.95     420.8   20200.00
      3     1021.47   14.86    2.638  0.30( 0.29) 0.95     470.0   20100.00
      4     1357.62   54.63    1.234  0.30( 0.28) 0.95    1582.5   13510.00
      5     1292.73   63.04    1.154  0.30( 0.28) 0.95    1646.9   13500.00
    TOTAL AREA(ACRES) =      1646.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1357.62  Tc(MIN.) =   54.635
  EFFECTIVE AREA(ACRES) =   1582.54  AREA-AVERAGED Fm(INCH/HR) =  0.28
```



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  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1646.9
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.00  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   672.93   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.58
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.220
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.94      0.30     0.884     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.884
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1369.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.41
  AVERAGE FLOW DEPTH(FEET) =   3.58   TRAVEL TIME(MIN.) =   1.19
  Tc(MIN.) =   55.83
  SUBAREA AREA(ACRES) =    27.94       SUBAREA RUNOFF(CFS) =   24.02
  EFFECTIVE AREA(ACRES) =   1610.48     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =     1674.8          PEAK FLOW RATE(CFS) =    1357.62
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.56   FLOW VELOCITY(FEET/SEC.) =   9.38
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1013.84   14.41    2.708  0.30( 0.29) 0.95     446.0   20210.00
      2     1015.03   14.50    2.694  0.30( 0.29) 0.95     448.8   20200.00
      3     1021.47   16.15    2.517  0.30( 0.29) 0.95     497.9   20100.00
      4     1357.62   55.83    1.220  0.30( 0.28) 0.95    1610.5   13510.00
      5     1298.87   64.25    1.145  0.30( 0.28) 0.95    1674.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1357.62  Tc(MIN.) =   55.83
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1610.48

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1013.84   14.41    2.708  0.30( 0.29) 0.95     446.0   20210.00
     2     1015.03   14.50    2.694  0.30( 0.29) 0.95     448.8   20200.00
     3     1021.47   16.15    2.517  0.30( 0.29) 0.95     497.9   20100.00
     4     1357.62   55.83    1.220  0.30( 0.28) 0.95    1610.5   13510.00
     5     1298.87   64.25    1.145  0.30( 0.28) 0.95    1674.8   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      144.04   20.65    2.152  0.30( 0.30) 1.00      86.4   13600.00
 LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1144.48   14.41    2.708  0.30( 0.29) 0.96     506.3   20210.00
     2     1145.72   14.50    2.694  0.30( 0.29) 0.96     509.4   20200.00
     3     1156.33   16.15    2.517  0.30( 0.29) 0.96     565.5   20100.00
     4     1203.61   20.65    2.152  0.30( 0.29) 0.96     710.4   13600.00
     5     1429.19   55.83    1.220  0.30( 0.29) 0.95    1696.9   13510.00
     6     1364.61   64.25    1.145  0.30( 0.28) 0.95    1761.2   13500.00
   TOTAL AREA(ACRES) =      1761.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1429.19  Tc(MIN.) =   55.827
 EFFECTIVE AREA(ACRES) =   1696.88  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     1761.2
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13620.00 TO NODE  13621.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    544.91  DOWNSTREAM(FEET) =    527.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   868.57   CHANNEL SLOPE =  0.0206
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.44
 CHANNEL FLOW THRU SUBAREA(CFS) =    1429.19
 FLOW VELOCITY(FEET/SEC.) =  10.29   FLOW DEPTH(FEET) =   3.44
 TRAVEL TIME(MIN.) =   1.41   Tc(MIN.) =   57.23
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1144.48   15.91    2.538  0.30( 0.29) 0.96     506.3   20210.00
     2     1145.72   16.00    2.530  0.30( 0.29) 0.96     509.4   20200.00
     3     1156.33   17.65    2.390  0.30( 0.29) 0.96     565.5   20100.00
     4     1203.61   22.13    2.066  0.30( 0.29) 0.96     710.4   13600.00
     5     1429.19   57.23    1.205  0.30( 0.29) 0.95    1696.9   13510.00
```



```
     6     1364.61   65.68    1.136  0.30( 0.28) 0.95    1761.2   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1429.19  Tc(MIN.) =   57.23
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1696.88

****************************************************************************
 FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610203X.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM        Q      Tc      Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       63.11   13.45  0.30( 0.30) 1.00      27.4   20300.00
   TOTAL AREA(ACRES) =       27.4

****************************************************************************
 FLOW PROCESS FROM NODE  13621.00 TO NODE  13621.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1144.48   15.91    2.538  0.30( 0.29) 0.96     506.3   20210.00
     2     1145.72   16.00    2.530  0.30( 0.29) 0.96     509.4   20200.00
     3     1156.33   17.65    2.390  0.30( 0.29) 0.96     565.5   20100.00
     4     1203.61   22.13    2.066  0.30( 0.29) 0.96     710.4   13600.00
     5     1429.19   57.23    1.205  0.30( 0.29) 0.95    1696.9   13510.00
     6     1364.61   65.68    1.136  0.30( 0.28) 0.95    1761.2   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       63.11   13.45    2.857  0.30( 0.30) 1.00      27.4   20300.00
 LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  13621.00 =    2609.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1167.92   13.45    2.857  0.30( 0.29) 0.96     455.4   20300.00
     2     1199.70   15.91    2.538  0.30( 0.29) 0.96     533.7   20210.00
     3     1200.75   16.00    2.530  0.30( 0.29) 0.96     536.8   20200.00
     4     1207.91   17.65    2.390  0.30( 0.29) 0.96     592.9   20100.00
     5     1247.20   22.13    2.066  0.30( 0.29) 0.96     737.8   13600.00
     6     1451.52   57.23    1.205  0.30( 0.29) 0.95    1724.3   13510.00
     7     1385.24   65.68    1.136  0.30( 0.28) 0.95    1788.6   13500.00
   TOTAL AREA(ACRES) =      1788.6
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1451.52  Tc(MIN.) =   57.234
  EFFECTIVE AREA(ACRES) =   1724.30  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1788.6
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13622.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    527.00  DOWNSTREAM(FEET) =    512.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    56.08   CHANNEL SLOPE =  0.2675
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68
  CHANNEL FLOW THRU SUBAREA(CFS) =    1451.52
  FLOW VELOCITY(FEET/SEC.) =  24.64   FLOW DEPTH(FEET) =   1.68
  TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =   57.27
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1167.92   13.49    2.851  0.30( 0.29) 0.96     455.4   20300.00
      2     1199.70   15.95    2.534  0.30( 0.29) 0.96     533.7   20210.00
      3     1200.75   16.04    2.526  0.30( 0.29) 0.96     536.8   20200.00
      4     1207.91   17.69    2.386  0.30( 0.29) 0.96     592.9   20100.00
      5     1247.20   22.17    2.064  0.30( 0.29) 0.96     737.8   13600.00
      6     1451.52   57.27    1.204  0.30( 0.29) 0.95    1724.3   13510.00
      7     1385.24   65.72    1.135  0.30( 0.28) 0.95    1788.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1451.52  Tc(MIN.) =   57.27
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1724.30

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610204X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       75.55   13.11  0.30( 0.30) 1.00      32.2   20400.00
    TOTAL AREA(ACRES) =       32.2

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1167.92   13.49    2.851  0.30( 0.29) 0.96     455.4   20300.00
      2     1199.70   15.95    2.534  0.30( 0.29) 0.96     533.7   20210.00
      3     1200.75   16.04    2.526  0.30( 0.29) 0.96     536.8   20200.00
      4     1207.91   17.69    2.386  0.30( 0.29) 0.96     592.9   20100.00
      5     1247.20   22.17    2.064  0.30( 0.29) 0.96     737.8   13600.00
      6     1451.52   57.27    1.204  0.30( 0.29) 0.95    1724.3   13510.00
      7     1385.24   65.72    1.135  0.30( 0.28) 0.95    1788.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       75.55   13.11    2.910  0.30( 0.30) 1.00      32.2   20400.00
  LONGEST FLOWPATH FROM NODE  20400.00 TO NODE  13622.00 =    2281.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1236.83   13.11    2.910  0.30( 0.29) 0.96     474.7   20400.00
      2     1241.74   13.49    2.851  0.30( 0.29) 0.96     487.6   20300.00
      3     1264.36   15.95    2.534  0.30( 0.29) 0.96     565.9   20210.00
      4     1265.19   16.04    2.526  0.30( 0.29) 0.96     569.0   20200.00
      5     1268.29   17.69    2.386  0.30( 0.29) 0.96     625.1   20100.00
      6     1298.25   22.17    2.064  0.30( 0.29) 0.96     770.0   13600.00
      7     1477.69   57.27    1.204  0.30( 0.29) 0.95    1756.5   13510.00
      8     1409.42   65.72    1.135  0.30( 0.28) 0.95    1820.8   13500.00
    TOTAL AREA(ACRES) =      1820.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1477.69  Tc(MIN.) =   57.272
  EFFECTIVE AREA(ACRES) =   1756.46  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1820.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13640.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    512.00  DOWNSTREAM(FEET) =    489.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.72   CHANNEL SLOPE =  0.0500
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.79
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.198
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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 USER-DEFINED               -      112.88      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1523.33
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.24
 AVERAGE FLOW DEPTH(FEET) =   2.79   TRAVEL TIME(MIN.) =   0.54
 Tc(MIN.) =   57.81
 SUBAREA AREA(ACRES) =   112.88       SUBAREA RUNOFF(CFS) =   91.27
 EFFECTIVE AREA(ACRES) =   1869.34     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     1933.7          PEAK FLOW RATE(CFS) =    1534.10
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.80

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.80   FLOW VELOCITY(FEET/SEC.) =  14.29
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1339.31   13.67    2.823  0.30( 0.29) 0.97     587.6   20400.00
     2     1336.51   14.05    2.764  0.30( 0.29) 0.97     600.5   20300.00
     3     1341.98   16.51    2.487  0.30( 0.29) 0.97     678.8   20210.00
     4     1343.35   16.60    2.479  0.30( 0.29) 0.97     681.9   20200.00
     5     1360.83   18.25    2.339  0.30( 0.29) 0.97     737.9   20100.00
     6     1384.23   22.72    2.031  0.30( 0.29) 0.96     882.9   13600.00
     7     1534.10   57.81    1.198  0.30( 0.29) 0.96    1869.3   13510.00
     8     1472.28   66.26    1.132  0.30( 0.29) 0.95    1933.7   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1534.10  Tc(MIN.) =   57.81
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1869.34

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610205X.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       20.96   11.32  0.30( 0.30) 1.00       8.1   20500.00
   TOTAL AREA(ACRES) =        8.1

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1339.31   13.67    2.823  0.30( 0.29) 0.97     587.6   20400.00
     2     1336.51   14.05    2.764  0.30( 0.29) 0.97     600.5   20300.00
```



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     3     1341.98   16.51    2.487  0.30( 0.29) 0.97     678.8   20210.00
     4     1343.35   16.60    2.479  0.30( 0.29) 0.97     681.9   20200.00
     5     1360.83   18.25    2.339  0.30( 0.29) 0.97     737.9   20100.00
     6     1384.23   22.72    2.031  0.30( 0.29) 0.96     882.9   13600.00
     7     1534.10   57.81    1.198  0.30( 0.29) 0.96    1869.3   13510.00
     8     1472.28   66.26    1.132  0.30( 0.29) 0.95    1933.7   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       20.96   11.32    3.191  0.30( 0.30) 1.00       8.1   20500.00
 LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  13640.00 =    1025.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1290.67   11.32    3.191  0.30( 0.29) 0.97     494.6   20500.00
     2     1357.61   13.67    2.823  0.30( 0.29) 0.97     595.6   20400.00
     3     1354.38   14.05    2.764  0.30( 0.29) 0.97     608.5   20300.00
     4     1357.84   16.51    2.487  0.30( 0.29) 0.97     686.8   20210.00
     5     1359.16   16.60    2.479  0.30( 0.29) 0.97     689.9   20200.00
     6     1375.61   18.25    2.339  0.30( 0.29) 0.97     746.0   20100.00
     7     1396.78   22.72    2.031  0.30( 0.29) 0.97     890.9   13600.00
     8     1540.61   57.81    1.198  0.30( 0.29) 0.96    1877.4   13510.00
     9     1478.31   66.26    1.132  0.30( 0.29) 0.95    1941.7   13500.00
   TOTAL AREA(ACRES) =      1941.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1540.61  Tc(MIN.) =   57.810
 EFFECTIVE AREA(ACRES) =   1877.40  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =     1941.7
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13641.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    489.00  DOWNSTREAM(FEET) =    436.89
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2992.90   CHANNEL SLOPE =  0.0174
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.155
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      180.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1610.03
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.06
 AVERAGE FLOW DEPTH(FEET) =   3.85   TRAVEL TIME(MIN.) =   4.96
 Tc(MIN.) =   62.77
 SUBAREA AREA(ACRES) =   180.31       SUBAREA RUNOFF(CFS) =  138.82
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 EFFECTIVE AREA(ACRES) =   2057.71     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     2122.0         PEAK FLOW RATE(CFS) =    1606.89
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.84   FLOW VELOCITY(FEET/SEC.) =  10.07
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13641.00 =   25054.98 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1337.58   16.41    2.495  0.30( 0.29) 0.98     674.9   20500.00
     2     1401.75   18.70    2.300  0.30( 0.29) 0.98     775.9   20400.00
     3     1401.67   19.09    2.267  0.30( 0.29) 0.98     788.8   20300.00
     4     1409.75   21.57    2.099  0.30( 0.29) 0.97     867.1   20210.00
     5     1410.78   21.66    2.093  0.30( 0.29) 0.97     870.2   20200.00
     6     1422.49   23.30    1.998  0.30( 0.29) 0.97     926.3   20100.00
     7     1447.55   27.77    1.793  0.30( 0.29) 0.97    1071.2   13600.00
     8     1606.89   62.77    1.155  0.30( 0.29) 0.96    2057.7   13510.00
     9     1548.82   71.28    1.098  0.30( 0.29) 0.96    2122.0   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1606.89  Tc(MIN.) =   62.77
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    2057.71

****************************************************************************
 FLOW PROCESS FROM NODE  13641.00 TO NODE  13642.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    436.89  DOWNSTREAM(FEET) =    394.80
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2814.16   CHANNEL SLOPE =  0.0150
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.24
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.123
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      451.39      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1774.14
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.83
 AVERAGE FLOW DEPTH(FEET) =   4.23   TRAVEL TIME(MIN.) =   4.77
 Tc(MIN.) =   67.54
 SUBAREA AREA(ACRES) =   451.39       SUBAREA RUNOFF(CFS) =  334.47
 EFFECTIVE AREA(ACRES) =   2509.10     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     2573.4         PEAK FLOW RATE(CFS) =    1881.84
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.37
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.37   FLOW VELOCITY(FEET/SEC.) =  10.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13642.00 =   27869.14 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1847.33   21.23    2.118  0.30( 0.30) 0.99    1126.3   20500.00
     2     1867.61   23.50    1.986  0.30( 0.30) 0.99    1227.3   20400.00
     3     1861.79   23.89    1.963  0.30( 0.30) 0.98    1240.2   20300.00
     4     1840.63   26.38    1.846  0.30( 0.29) 0.98    1318.5   20210.00
     5     1840.98   26.47    1.843  0.30( 0.29) 0.98    1321.6   20200.00
     6     1841.37   28.11    1.780  0.30( 0.29) 0.98    1377.7   20100.00
     7     1844.31   32.59    1.640  0.30( 0.29) 0.98    1522.6   13600.00
     8     1881.84   67.54    1.123  0.30( 0.29) 0.97    2509.1   13510.00
     9     1797.74   76.11    1.066  0.30( 0.29) 0.96    2573.4   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1881.84  Tc(MIN.) =   67.54
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =    2509.10

****************************************************************************
 FLOW PROCESS FROM NODE  13642.00 TO NODE  13643.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    394.80  DOWNSTREAM(FEET) =    342.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2913.57   CHANNEL SLOPE =  0.0180
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.34
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.093
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      434.58      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2037.00
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.92
 AVERAGE FLOW DEPTH(FEET) =   4.34   TRAVEL TIME(MIN.) =   4.45
 Tc(MIN.) =   71.98
 SUBAREA AREA(ACRES) =   434.58       SUBAREA RUNOFF(CFS) =  310.30
 EFFECTIVE AREA(ACRES) =   2943.68     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     3008.0         PEAK FLOW RATE(CFS) =    2124.54
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.44

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.44   FLOW VELOCITY(FEET/SEC.) =  11.06
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13643.00 =   30782.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
      1     2218.09   25.60    1.876  0.30( 0.30) 0.99    1560.8   20500.00
      2     2231.82   27.87    1.789  0.30( 0.30) 0.99    1661.9   20400.00
      3     2226.03   28.27    1.773  0.30( 0.30) 0.99    1674.8   20300.00
      4     2194.15   30.78    1.687  0.30( 0.30) 0.99    1753.1   20210.00
      5     2194.44   30.87    1.684  0.30( 0.30) 0.99    1756.2   20200.00
      6     2195.11   32.51    1.642  0.30( 0.30) 0.99    1812.3   20100.00
      7     2166.07   37.01    1.525  0.30( 0.30) 0.98    1957.2   13600.00
      8     2124.54   71.98    1.093  0.30( 0.29) 0.97    2943.7   13510.00
      9     2015.01   80.62    1.035  0.30( 0.29) 0.97    3008.0   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2231.82  Tc(MIN.) =   27.87
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1661.92

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    342.39  DOWNSTREAM(FEET) =    300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1591.23   CHANNEL SLOPE =  0.0266
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.17
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.711
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      109.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2301.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.01
  AVERAGE FLOW DEPTH(FEET) =   4.16   TRAVEL TIME(MIN.) =   2.04
  Tc(MIN.) =   29.91
  SUBAREA AREA(ACRES) =   109.24       SUBAREA RUNOFF(CFS) =  138.68
  EFFECTIVE AREA(ACRES) =   1771.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3117.3         PEAK FLOW RATE(CFS) =    2253.42
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.12   FLOW VELOCITY(FEET/SEC.) =  12.92
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2255.19   27.64    1.798  0.30( 0.30) 0.99    1670.1   20500.00
      2     2253.42   29.91    1.711  0.30( 0.30) 0.99    1771.2   20400.00
      3     2251.35   30.31    1.699  0.30( 0.30) 0.99    1784.0   20300.00
      4     2241.16   32.83    1.633  0.30( 0.30) 0.99    1862.3   20210.00
      5     2241.09   32.92    1.631  0.30( 0.30) 0.99    1865.5   20200.00
      6     2234.80   34.56    1.588  0.30( 0.30) 0.99    1921.5   20100.00
      7     2186.90   39.07    1.471  0.30( 0.30) 0.98    2066.4   13600.00
```



```
      8     2164.12   74.06    1.079  0.30( 0.29) 0.97    3052.9   13510.00
      9     2047.41   82.73    1.021  0.30( 0.29) 0.97    3117.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2255.19  Tc(MIN.) =   27.64
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1670.07

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610206X.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      294.91   22.21  0.30( 0.30) 1.00     186.0   20600.00
    TOTAL AREA(ACRES) =      186.0

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2255.19   27.64    1.798  0.30( 0.30) 0.99    1670.1   20500.00
      2     2253.42   29.91    1.711  0.30( 0.30) 0.99    1771.2   20400.00
      3     2251.35   30.31    1.699  0.30( 0.30) 0.99    1784.0   20300.00
      4     2241.16   32.83    1.633  0.30( 0.30) 0.99    1862.3   20210.00
      5     2241.09   32.92    1.631  0.30( 0.30) 0.99    1865.5   20200.00
      6     2234.80   34.56    1.588  0.30( 0.30) 0.99    1921.5   20100.00
      7     2186.90   39.07    1.471  0.30( 0.30) 0.98    2066.4   13600.00
      8     2164.12   74.06    1.079  0.30( 0.29) 0.97    3052.9   13510.00
      9     2047.41   82.73    1.021  0.30( 0.29) 0.97    3117.3   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      294.91   22.21    2.061  0.30( 0.30) 1.00     186.0   20600.00
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  13660.00 =    6967.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2425.69   22.21    2.061  0.30( 0.30) 0.99    1528.2   20600.00
      2     2505.97   27.64    1.798  0.30( 0.30) 0.99    1856.1   20500.00
      3     2489.61   29.91    1.711  0.30( 0.30) 0.99    1957.2   20400.00
      4     2485.60   30.31    1.699  0.30( 0.30) 0.99    1970.1   20300.00
```

```
      5     2464.45   32.83    1.633  0.30( 0.30) 0.99    2048.4   20210.00
      6     2464.00   32.92    1.631  0.30( 0.30) 0.99    2051.5   20200.00
      7     2450.54   34.56    1.588  0.30( 0.30) 0.99    2107.6   20100.00
      8     2383.04   39.07    1.471  0.30( 0.30) 0.99    2252.5   13600.00
      9     2294.62   74.06    1.079  0.30( 0.29) 0.97    3238.9   13510.00
     10     2168.15   82.73    1.021  0.30( 0.29) 0.97    3303.3   13500.00
    TOTAL AREA(ACRES) =      3303.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2505.97  Tc(MIN.) =   27.640
  EFFECTIVE AREA(ACRES) =   1856.10  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3303.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    300.00  DOWNSTREAM(FEET) =    288.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   933.89   CHANNEL SLOPE =  0.0128
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.34
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.740
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2545.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.35
  AVERAGE FLOW DEPTH(FEET) =   5.34   TRAVEL TIME(MIN.) =   1.50
  Tc(MIN.) =   29.14
  SUBAREA AREA(ACRES) =    61.43       SUBAREA RUNOFF(CFS) =   79.61
  EFFECTIVE AREA(ACRES) =   1917.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3364.7         PEAK FLOW RATE(CFS) =    2505.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.30   FLOW VELOCITY(FEET/SEC.) =  10.31
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2425.69   23.73    1.973  0.30( 0.30) 0.99    1589.6   20600.00
      2     2505.97   29.14    1.740  0.30( 0.30) 0.99    1917.5   20500.00
      3     2494.35   31.42    1.670  0.30( 0.30) 0.99    2018.6   20400.00
      4     2491.31   31.82    1.660  0.30( 0.30) 0.99    2031.5   20300.00
      5     2464.45   34.34    1.594  0.30( 0.30) 0.99    2109.8   20210.00
```



```
      6     2464.00   34.43    1.592  0.30( 0.30) 0.99    2112.9   20200.00
      7     2450.54   36.08    1.549  0.30( 0.30) 0.99    2169.0   20100.00
      8     2383.04   40.59    1.437  0.30( 0.30) 0.99    2313.9   13600.00
      9     2306.82   75.61    1.069  0.30( 0.29) 0.97    3300.4   13510.00
     10     2175.95   84.30    1.010  0.30( 0.29) 0.97    3364.7   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2505.97  Tc(MIN.) =   29.14
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1917.53

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610207X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      352.76   16.08  0.30( 0.28) 0.92     174.5   20700.00
    TOTAL AREA(ACRES) =      174.5

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2425.69   23.73    1.973  0.30( 0.30) 0.99    1589.6   20600.00
      2     2505.97   29.14    1.740  0.30( 0.30) 0.99    1917.5   20500.00
      3     2494.35   31.42    1.670  0.30( 0.30) 0.99    2018.6   20400.00
      4     2491.31   31.82    1.660  0.30( 0.30) 0.99    2031.5   20300.00
      5     2464.45   34.34    1.594  0.30( 0.30) 0.99    2109.8   20210.00
      6     2464.00   34.43    1.592  0.30( 0.30) 0.99    2112.9   20200.00
      7     2450.54   36.08    1.549  0.30( 0.30) 0.99    2169.0   20100.00
      8     2383.04   40.59    1.437  0.30( 0.30) 0.99    2313.9   13600.00
      9     2306.82   75.61    1.069  0.30( 0.29) 0.97    3300.4   13510.00
     10     2175.95   84.30    1.010  0.30( 0.29) 0.97    3364.7   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      352.76   16.08    2.523  0.30( 0.28) 0.92     174.5   20700.00
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  13680.00 =    6221.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
```

```
     1     2536.58   16.08    2.523  0.30( 0.29) 0.98    1251.9   20700.00
     2     2692.08   23.73    1.973  0.30( 0.30) 0.99    1764.1   20600.00
     3     2735.74   29.14    1.740  0.30( 0.30) 0.99    2092.0   20500.00
     4     2713.18   31.42    1.670  0.30( 0.30) 0.99    2193.1   20400.00
     5     2708.50   31.82    1.660  0.30( 0.30) 0.99    2206.0   20300.00
     6     2671.34   34.34    1.594  0.30( 0.30) 0.98    2284.3   20210.00
     7     2670.53   34.43    1.592  0.30( 0.30) 0.98    2287.4   20200.00
     8     2650.33   36.08    1.549  0.30( 0.30) 0.98    2343.5   20100.00
     9     2565.31   40.59    1.437  0.30( 0.29) 0.98    2488.4   13600.00
    10     2431.20   75.61    1.069  0.30( 0.29) 0.97    3474.9   13510.00
    11     2291.14   84.30    1.010  0.30( 0.29) 0.97    3539.2   13500.00
   TOTAL AREA(ACRES) =      3539.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2735.74  Tc(MIN.) =   29.144
  EFFECTIVE AREA(ACRES) =   2092.04  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3539.2
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.00  DOWNSTREAM(FEET) =    242.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.77   CHANNEL SLOPE =  0.0161
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.31
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.622
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2802.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.53
  AVERAGE FLOW DEPTH(FEET) =   5.30   TRAVEL TIME(MIN.) =   4.14
  Tc(MIN.) =   33.28
  SUBAREA AREA(ACRES) =   112.53       SUBAREA RUNOFF(CFS) =  133.87
  EFFECTIVE AREA(ACRES) =   2204.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3651.8         PEAK FLOW RATE(CFS) =    2735.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.23   FLOW VELOCITY(FEET/SEC.) =  11.45
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```



```
     1     2536.58   20.30    2.173  0.30( 0.30) 0.98    1364.5   20700.00
     2     2692.08   27.88    1.788  0.30( 0.30) 0.99    1876.7   20600.00
     3     2735.74   33.28    1.622  0.30( 0.30) 0.99    2204.6   20500.00
     4     2713.18   35.56    1.562  0.30( 0.30) 0.99    2305.7   20400.00
     5     2708.50   35.97    1.552  0.30( 0.30) 0.99    2318.5   20300.00
     6     2671.34   38.50    1.486  0.30( 0.30) 0.99    2396.8   20210.00
     7     2670.53   38.59    1.484  0.30( 0.30) 0.99    2400.0   20200.00
     8     2650.33   40.25    1.443  0.30( 0.30) 0.98    2456.0   20100.00
     9     2565.31   44.81    1.369  0.30( 0.29) 0.98    2600.9   13600.00
    10     2431.20   79.90    1.040  0.30( 0.29) 0.97    3587.4   13510.00
    11     2291.14   88.66    0.981  0.30( 0.29) 0.97    3651.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2735.74  Tc(MIN.) =   33.28
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2204.57

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610208X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      343.71   15.59  0.30( 0.30) 0.99     168.5   20810.00
      2      337.32   18.53  0.30( 0.30) 0.99     185.8   20800.00
    TOTAL AREA(ACRES) =      185.8

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2536.58   20.30    2.173  0.30( 0.30) 0.98    1364.5   20700.00
      2     2692.08   27.88    1.788  0.30( 0.30) 0.99    1876.7   20600.00
      3     2735.74   33.28    1.622  0.30( 0.30) 0.99    2204.6   20500.00
      4     2713.18   35.56    1.562  0.30( 0.30) 0.99    2305.7   20400.00
      5     2708.50   35.97    1.552  0.30( 0.30) 0.99    2318.5   20300.00
      6     2671.34   38.50    1.486  0.30( 0.30) 0.99    2396.8   20210.00
      7     2670.53   38.59    1.484  0.30( 0.30) 0.99    2400.0   20200.00
      8     2650.33   40.25    1.443  0.30( 0.30) 0.98    2456.0   20100.00
      9     2565.31   44.81    1.369  0.30( 0.29) 0.98    2600.9   13600.00
     10     2431.20   79.90    1.040  0.30( 0.29) 0.97    3587.4   13510.00
     11     2291.14   88.66    0.981  0.30( 0.29) 0.97    3651.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	343.71	15.59	2.565	0.30(0.30)	0.99	168.5	20810.00
2	337.32	18.53	2.315	0.30(0.30)	0.99	185.8	20800.00

LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 13682.00 = 5285.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2699.11	15.59	2.565	0.30(0.30)	0.99	1216.7	20810.00
2	2828.47	18.53	2.315	0.30(0.30)	0.99	1431.4	20800.00
3	2850.08	20.30	2.173	0.30(0.30)	0.99	1550.3	20700.00
4	2941.29	27.88	1.788	0.30(0.30)	0.99	2062.5	20600.00
5	2957.07	33.28	1.622	0.30(0.30)	0.99	2390.4	20500.00
6	2924.60	35.56	1.562	0.30(0.30)	0.99	2491.5	20400.00
7	2918.15	35.97	1.552	0.30(0.30)	0.99	2504.4	20300.00
8	2869.96	38.50	1.486	0.30(0.30)	0.99	2582.7	20210.00
9	2868.76	38.59	1.484	0.30(0.30)	0.99	2585.8	20200.00
10	2841.75	40.25	1.443	0.30(0.30)	0.99	2641.8	20100.00
11	2744.39	44.81	1.369	0.30(0.30)	0.98	2786.8	13600.00
12	2555.24	79.90	1.040	0.30(0.29)	0.97	3773.2	13510.00
13	2405.31	88.66	0.981	0.30(0.29)	0.97	3837.6	13500.00

TOTAL AREA(ACRES) = 3837.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 2957.07 Tc(MIN.) = 33.280
EFFECTIVE AREA(ACRES) = 2390.38 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3837.6
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

****
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.50 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 242.00 DOWNSTREAM(FEET) = 230.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 660.20 CHANNEL SLOPE = 0.0182
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.28
CHANNEL FLOW THRU SUBAREA(CFS) = 2957.07
FLOW VELOCITY(FEET/SEC.) = 12.23 FLOW DEPTH(FEET) = 5.28
TRAVEL TIME(MIN.) = 0.90 Tc(MIN.) = 34.18
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2699.11	16.51	2.486	0.30(0.30)	0.99	1216.7	20810.00
2	2828.47	19.44	2.238	0.30(0.30)	0.99	1431.4	20800.00
3	2850.08	21.21	2.120	0.30(0.30)	0.99	1550.3	20700.00
4	2941.29	28.78	1.754	0.30(0.30)	0.99	2062.5	20600.00
5	2957.07	34.18	1.598	0.30(0.30)	0.99	2390.4	20500.00
6	2924.60	36.46	1.539	0.30(0.30)	0.99	2491.5	20400.00
7	2918.15	36.87	1.528	0.30(0.30)	0.99	2504.4	20300.00
8	2869.96	39.41	1.462	0.30(0.30)	0.99	2582.7	20210.00

9	2868.76	39.50	1.460	0.30(0.30)	0.99	2585.8	20200.00
10	2841.75	41.16	1.428	0.30(0.30)	0.99	2641.8	20100.00
11	2744.39	45.73	1.354	0.30(0.30)	0.98	2786.8	13600.00
12	2555.24	80.84	1.034	0.30(0.29)	0.97	3773.2	13510.00
13	2405.31	89.62	0.975	0.30(0.29)	0.97	3837.6	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 2957.07 Tc(MIN.) = 34.18
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2390.38

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610209X.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	149.04	16.86	0.30(0.30)	1.00	76.8	20900.00

TOTAL AREA(ACRES) = 76.8

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2699.11	16.51	2.486	0.30(0.30)	0.99	1216.7	20810.00
2	2828.47	19.44	2.238	0.30(0.30)	0.99	1431.4	20800.00
3	2850.08	21.21	2.120	0.30(0.30)	0.99	1550.3	20700.00
4	2941.29	28.78	1.754	0.30(0.30)	0.99	2062.5	20600.00
5	2957.07	34.18	1.598	0.30(0.30)	0.99	2390.4	20500.00
6	2924.60	36.46	1.539	0.30(0.30)	0.99	2491.5	20400.00
7	2918.15	36.87	1.528	0.30(0.30)	0.99	2504.4	20300.00
8	2869.96	39.41	1.462	0.30(0.30)	0.99	2582.7	20210.00
9	2868.76	39.50	1.460	0.30(0.30)	0.99	2585.8	20200.00
10	2841.75	41.16	1.428	0.30(0.30)	0.99	2641.8	20100.00
11	2744.39	45.73	1.354	0.30(0.30)	0.98	2786.8	13600.00
12	2555.24	80.84	1.034	0.30(0.29)	0.97	3773.2	13510.00
13	2405.31	89.62	0.975	0.30(0.29)	0.97	3837.6	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	149.04	16.86	2.457	0.30(0.30)	1.00	76.8	20900.00

LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 13682.50 = 4089.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2847.10	16.51	2.486	0.30(0.30)	0.99	1291.9	20810.00
2	2863.23	16.86	2.457	0.30(0.30)	0.99	1318.5	20900.00
3	2962.34	19.44	2.238	0.30(0.30)	0.99	1508.1	20800.00
4	2975.81	21.21	2.120	0.30(0.30)	0.99	1627.0	20700.00
5	3041.73	28.78	1.754	0.30(0.30)	0.99	2139.2	20600.00
6	3046.77	34.18	1.598	0.30(0.30)	0.99	2467.1	20500.00
7	3010.20	36.46	1.539	0.30(0.30)	0.99	2568.2	20400.00
8	3003.02	36.87	1.528	0.30(0.30)	0.99	2581.1	20300.00
9	2950.27	39.41	1.462	0.30(0.30)	0.99	2659.4	20210.00
10	2948.91	39.50	1.460	0.30(0.30)	0.99	2662.5	20200.00
11	2919.69	41.16	1.428	0.30(0.30)	0.99	2718.6	20100.00
12	2817.23	45.73	1.354	0.30(0.30)	0.98	2863.5	13600.00
13	2605.93	80.84	1.034	0.30(0.29)	0.97	3850.0	13510.00
14	2451.92	89.62	0.975	0.30(0.29)	0.97	3914.3	13500.00

TOTAL AREA(ACRES) = 3914.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3046.77 Tc(MIN.) = 34.180
EFFECTIVE AREA(ACRES) = 2467.14 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3914.3
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13683.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 230.00 DOWNSTREAM(FEET) = 208.53
CHANNEL LENGTH THRU SUBAREA(FEET) = 1866.20 CHANNEL SLOPE = 0.0115
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.08
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.521
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.32	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3081.02
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.51
AVERAGE FLOW DEPTH(FEET) = 6.08 TRAVEL TIME(MIN.) = 2.96
Tc(MIN.) = 37.14
SUBAREA AREA(ACRES) = 62.32 SUBAREA RUNOFF(CFS) = 68.51
EFFECTIVE AREA(ACRES) = 2529.46 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3976.6 PEAK FLOW RATE(CFS) = 3046.77
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.05 FLOW VELOCITY(FEET/SEC.) = 10.47
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13683.00 = 38695.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2847.10	19.53	2.230	0.30(0.30)	0.99	1354.2	20810.00
2	2863.23	19.86	2.202	0.30(0.30)	0.99	1380.8	20900.00
3	2962.34	22.42	2.049	0.30(0.30)	0.99	1570.4	20800.00
4	2975.81	24.18	1.947	0.30(0.30)	0.99	1689.3	20700.00
5	3041.73	31.74	1.662	0.30(0.30)	0.99	2201.6	20600.00
6	3046.77	37.14	1.521	0.30(0.30)	0.99	2529.5	20500.00
7	3010.20	39.43	1.462	0.30(0.30)	0.99	2630.5	20400.00
8	3003.02	39.84	1.451	0.30(0.30)	0.99	2643.4	20300.00
9	2950.27	42.40	1.408	0.30(0.30)	0.99	2721.7	20210.00
10	2948.91	42.49	1.407	0.30(0.30)	0.99	2724.8	20200.00
11	2919.69	44.16	1.380	0.30(0.30)	0.99	2780.9	20100.00
12	2817.23	48.75	1.305	0.30(0.30)	0.98	2925.8	13600.00
13	2605.93	83.93	1.013	0.30(0.29)	0.97	3912.3	13510.00
14	2451.92	92.77	0.960	0.30(0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 3046.77 Tc(MIN.) = 37.14
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2529.46

****
FLOW PROCESS FROM NODE 13683.00 TO NODE 13684.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 208.53 DOWNSTREAM(FEET) = 200.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 166.32 CHANNEL SLOPE = 0.0513
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.06
CHANNEL FLOW THRU SUBAREA(CFS) = 3046.77
FLOW VELOCITY(FEET/SEC.) = 17.78 FLOW DEPTH(FEET) = 4.06
TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 37.30
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2847.10	19.69	2.217	0.30(0.30)	0.99	1354.2	20810.00
2	2863.23	20.02	2.189	0.30(0.30)	0.99	1380.8	20900.00
3	2962.34	22.58	2.040	0.30(0.30)	0.99	1570.4	20800.00
4	2975.81	24.34	1.938	0.30(0.30)	0.99	1689.3	20700.00
5	3041.73	31.90	1.658	0.30(0.30)	0.99	2201.6	20600.00
6	3046.77	37.30	1.517	0.30(0.30)	0.99	2529.5	20500.00
7	3010.20	39.59	1.458	0.30(0.30)	0.99	2630.5	20400.00
8	3003.02	40.00	1.447	0.30(0.30)	0.99	2643.4	20300.00
9	2950.27	42.56	1.406	0.30(0.30)	0.99	2721.7	20210.00
10	2948.91	42.64	1.404	0.30(0.30)	0.99	2724.8	20200.00
11	2919.69	44.32	1.377	0.30(0.30)	0.99	2780.9	20100.00
12	2817.23	48.91	1.303	0.30(0.30)	0.98	2925.8	13600.00
13	2605.93	84.10	1.012	0.30(0.29)	0.97	3912.3	13510.00
14	2451.92	92.94	0.959	0.30(0.29)	0.97	3976.6	13500.00

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3046.77  Tc(MIN.) =   37.30
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2529.46

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610210X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      159.68   17.00  0.30( 0.30) 1.00      82.7   21000.00
    TOTAL AREA(ACRES) =       82.7

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2847.10   19.69    2.217  0.30( 0.30) 0.99    1354.2   20810.00
      2     2863.23   20.02    2.189  0.30( 0.30) 0.99    1380.8   20900.00
      3     2962.34   22.58    2.040  0.30( 0.30) 0.99    1570.4   20800.00
      4     2975.81   24.34    1.938  0.30( 0.30) 0.99    1689.3   20700.00
      5     3041.73   31.90    1.658  0.30( 0.30) 0.99    2201.6   20600.00
      6     3046.77   37.30    1.517  0.30( 0.30) 0.99    2529.5   20500.00
      7     3010.20   39.59    1.458  0.30( 0.30) 0.99    2630.5   20400.00
      8     3003.02   40.00    1.447  0.30( 0.30) 0.99    2643.4   20300.00
      9     2950.27   42.56    1.406  0.30( 0.30) 0.99    2721.7   20210.00
     10     2948.91   42.64    1.404  0.30( 0.30) 0.99    2724.8   20200.00
     11     2919.69   44.32    1.377  0.30( 0.30) 0.99    2780.9   20100.00
     12     2817.23   48.91    1.303  0.30( 0.30) 0.98    2925.8   13600.00
     13     2605.93   84.10    1.012  0.30( 0.29) 0.97    3912.3   13510.00
     14     2451.92   92.94    0.959  0.30( 0.29) 0.97    3976.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      159.68   17.00    2.445  0.30( 0.30) 1.00      82.7   21000.00
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  13684.00 =    4160.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2910.65   17.00    2.445  0.30( 0.30) 0.99    1252.2   21000.00
```



```
      2     2989.79   19.69    2.217  0.30( 0.30) 0.99    1436.9   20810.00
      3     3003.85   20.02    2.189  0.30( 0.30) 0.99    1463.5   20900.00
      4     3091.89   22.58    2.040  0.30( 0.30) 0.99    1653.2   20800.00
      5     3097.72   24.34    1.938  0.30( 0.30) 0.99    1772.1   20700.00
      6     3142.81   31.90    1.658  0.30( 0.30) 0.99    2284.3   20600.00
      7     3137.40   37.30    1.517  0.30( 0.30) 0.99    2612.2   20500.00
      8     3096.39   39.59    1.458  0.30( 0.30) 0.99    2713.2   20400.00
      9     3088.42   40.00    1.447  0.30( 0.30) 0.99    2726.1   20300.00
     10     3032.58   42.56    1.406  0.30( 0.30) 0.99    2804.4   20210.00
     11     3031.11   42.64    1.404  0.30( 0.30) 0.99    2807.5   20200.00
     12     2999.88   44.32    1.377  0.30( 0.30) 0.99    2863.6   20100.00
     13     2891.88   48.91    1.303  0.30( 0.30) 0.98    3008.5   13600.00
     14     2658.92   84.10    1.012  0.30( 0.29) 0.98    3995.0   13510.00
     15     2501.00   92.94    0.959  0.30( 0.29) 0.97    4059.3   13500.00
   TOTAL AREA(ACRES) =      4059.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3142.81  Tc(MIN.) =   31.896
  EFFECTIVE AREA(ACRES) =   2284.27  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     4059.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13685.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    200.00  DOWNSTREAM(FEET) =    194.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   122.69   CHANNEL SLOPE =  0.0469
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.23
  CHANNEL FLOW THRU SUBAREA(CFS) =    3142.81
  FLOW VELOCITY(FEET/SEC.) =  17.41   FLOW DEPTH(FEET) =   4.23
  TRAVEL TIME(MIN.) =   0.12   Tc(MIN.) =   32.01
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13685.00 =   38984.01 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2910.65   17.12    2.435  0.30( 0.30) 0.99    1252.2   21000.00
      2     2989.79   19.81    2.207  0.30( 0.30) 0.99    1436.9   20810.00
      3     3003.85   20.14    2.182  0.30( 0.30) 0.99    1463.5   20900.00
      4     3091.89   22.69    2.033  0.30( 0.30) 0.99    1653.2   20800.00
      5     3097.72   24.46    1.931  0.30( 0.30) 0.99    1772.1   20700.00
      6     3142.81   32.01    1.655  0.30( 0.30) 0.99    2284.3   20600.00
      7     3137.40   37.41    1.514  0.30( 0.30) 0.99    2612.2   20500.00
      8     3096.39   39.71    1.455  0.30( 0.30) 0.99    2713.2   20400.00
      9     3088.42   40.12    1.445  0.30( 0.30) 0.99    2726.1   20300.00
     10     3032.58   42.67    1.404  0.30( 0.30) 0.99    2804.4   20210.00
     11     3031.11   42.76    1.402  0.30( 0.30) 0.99    2807.5   20200.00
     12     2999.88   44.44    1.375  0.30( 0.30) 0.99    2863.6   20100.00
     13     2891.88   49.03    1.301  0.30( 0.30) 0.98    3008.5   13600.00
     14     2658.92   84.22    1.011  0.30( 0.29) 0.98    3995.0   13510.00
     15     2501.00   93.06    0.959  0.30( 0.29) 0.97    4059.3   13500.00
  NEW PEAK FLOW DATA ARE:
```

```
  PEAK FLOW RATE(CFS) =    3142.81  Tc(MIN.) =   32.01
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2284.27

****************************************************************************
  FLOW PROCESS FROM NODE  13685.00 TO NODE  13410.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    194.24  DOWNSTREAM(FEET) =    178.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1843.57   CHANNEL SLOPE =  0.0084
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.66
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.570
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3147.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.45
  AVERAGE FLOW DEPTH(FEET) =   6.66   TRAVEL TIME(MIN.) =   3.25
  Tc(MIN.) =   35.26
  SUBAREA AREA(ACRES) =     8.39       SUBAREA RUNOFF(CFS) =    9.59
  EFFECTIVE AREA(ACRES) =   2292.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4067.7         PEAK FLOW RATE(CFS) =    3142.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.66   FLOW VELOCITY(FEET/SEC.) =   9.45
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13410.00 =   40827.58 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2910.65   20.44    2.164  0.30( 0.30) 0.99    1260.6   21000.00
      2     2989.79   23.10    2.010  0.30( 0.30) 0.99    1445.3   20810.00
      3     3003.85   23.43    1.990  0.30( 0.30) 0.99    1471.9   20900.00
      4     3091.89   25.96    1.862  0.30( 0.30) 0.99    1661.5   20800.00
      5     3097.72   27.72    1.795  0.30( 0.30) 0.99    1780.4   20700.00
      6     3142.81   35.26    1.570  0.30( 0.30) 0.99    2292.7   20600.00
      7     3137.40   40.67    1.436  0.30( 0.30) 0.99    2620.6   20500.00
      8     3096.39   42.97    1.399  0.30( 0.30) 0.99    2721.6   20400.00
      9     3088.42   43.38    1.392  0.30( 0.30) 0.99    2734.5   20300.00
     10     3032.58   45.96    1.350  0.30( 0.30) 0.99    2812.8   20210.00
     11     3031.11   46.05    1.349  0.30( 0.30) 0.99    2815.9   20200.00
     12     2999.88   47.73    1.322  0.30( 0.30) 0.99    2872.0   20100.00
     13     2891.88   52.36    1.259  0.30( 0.30) 0.98    3016.9   13600.00
     14     2658.92   87.63    0.988  0.30( 0.29) 0.98    4003.4   13510.00
     15     2501.00   96.53    0.944  0.30( 0.29) 0.97    4067.7   13500.00
  NEW PEAK FLOW DATA ARE:
```



```
  PEAK FLOW RATE(CFS) =    3142.81  Tc(MIN.) =   35.26
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2292.66
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     4067.7  TC(MIN.) =     35.26
  EFFECTIVE AREA(ACRES) =   2292.66  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.988
  PEAK FLOW RATE(CFS)   =    3142.81

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2910.65   20.44    2.164  0.30( 0.30) 0.99    1260.6   21000.00
      2     2989.79   23.10    2.010  0.30( 0.30) 0.99    1445.3   20810.00
      3     3003.85   23.43    1.990  0.30( 0.30) 0.99    1471.9   20900.00
      4     3091.89   25.96    1.862  0.30( 0.30) 0.99    1661.5   20800.00
      5     3097.72   27.72    1.795  0.30( 0.30) 0.99    1780.4   20700.00
      6     3142.81   35.26    1.570  0.30( 0.30) 0.99    2292.7   20600.00
      7     3137.40   40.67    1.436  0.30( 0.30) 0.99    2620.6   20500.00
      8     3096.39   42.97    1.399  0.30( 0.30) 0.99    2721.6   20400.00
      9     3088.42   43.38    1.392  0.30( 0.30) 0.99    2734.5   20300.00
     10     3032.58   45.96    1.350  0.30( 0.30) 0.99    2812.8   20210.00
     11     3031.11   46.05    1.349  0.30( 0.30) 0.99    2815.9   20200.00
     12     2999.88   47.73    1.322  0.30( 0.30) 0.99    2872.0   20100.00
     13     2891.88   52.36    1.259  0.30( 0.30) 0.98    3016.9   13600.00
     14     2658.92   87.63    0.988  0.30( 0.29) 0.98    4003.4   13510.00
     15     2501.00   96.53    0.944  0.30( 0.29) 0.97    4067.7   13500.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**********************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------------
  FILE NAME: S37.DAT
  TIME/DATE OF STUDY: 10:47 09/12/2017
================================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
================================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.240
   2)   10.00;  3.389
   3)   15.00;  2.611
   4)   20.00;  2.187
   5)   25.00;  1.897
   6)   30.00;  1.705
   7)   40.00;  1.446
   8)   50.00;  1.284
   9)   60.00;  1.172
  10)   90.00;  0.970
  11)  120.00;  0.840
  12)  180.00;  0.715
  13)  360.00;  0.524
  14) 1200.00;  0.229
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**********************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 15.1
--------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: S34.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    26658.49   17.95  0.30( 0.29) 0.98    4880.6   21100.00
      2    30360.77   28.10  0.30( 0.29) 0.98    8413.3   20700.00
      3    33126.59   36.60  0.30( 0.29) 0.98   11713.8   10100.00
      4    35614.16   43.75  0.30( 0.29) 0.98   15091.5   20300.00
      5    38708.80   56.17  0.30( 0.29) 0.97   21780.2   31400.00
      6    40394.63   66.28  0.30( 0.29) 0.97   27025.0   13100.00
      7    41101.24   73.36  0.30( 0.29) 0.97   30148.3   11801.00
      8    42514.23   84.05  0.30( 0.29) 0.97   35561.4   11530.00
      9    43341.49   88.35  0.30( 0.29) 0.97   38208.0   11701.00
     10    44998.43   96.87  0.30( 0.29) 0.97   43931.6   13500.00
     11    45940.34  101.79  0.30( 0.29) 0.97   47225.1   10800.00
     12    46359.49  106.00  0.30( 0.29) 0.97   50167.9   11130.00
     13    45813.15  115.60  0.30( 0.29) 0.98   55206.6   12410.00
     14    45078.25  123.92  0.30( 0.29) 0.98   58948.7   11201.00
     15    44584.01  128.90  0.30( 0.29) 0.98   60678.4   12201.00
     16    43495.41  135.99  0.30( 0.29) 0.98   62533.8   12231.00
     17    42125.82  143.86  0.30( 0.29) 0.98   64170.2   10400.00
     18    40705.29  151.86  0.30( 0.29) 0.98   65464.7   12010.00
     19    39476.49  157.89  0.30( 0.29) 0.98   65813.4   10210.00
     20    35085.31  186.30  0.30( 0.29) 0.98   66551.6   10100.00
   TOTAL AREA(ACRES) =    66551.6

**********************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 14.0
--------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
================================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    26658.49   17.95  0.30( 0.29) 0.98    4880.6   21100.00
      2    30360.77   28.10  0.30( 0.29) 0.98    8413.3   20700.00
      3    33126.59   36.60  0.30( 0.29) 0.98   11713.8   10100.00
      4    35614.16   43.75  0.30( 0.29) 0.98   15091.5   20300.00
      5    38708.80   56.17  0.30( 0.29) 0.97   21780.2   31400.00
      6    40394.63   66.28  0.30( 0.29) 0.97   27025.0   13100.00
      7    41101.24   73.36  0.30( 0.29) 0.97   30148.3   11801.00
      8    42514.23   84.05  0.30( 0.29) 0.97   35561.4   11530.00
      9    43341.49   88.35  0.30( 0.29) 0.97   38208.0   11701.00
     10    44998.43   96.87  0.30( 0.29) 0.97   43931.6   13500.00
     11    45940.34  101.79  0.30( 0.29) 0.97   47225.1   10800.00
     12    46359.49  106.00  0.30( 0.29) 0.97   50167.9   11130.00
     13    45813.15  115.60  0.30( 0.29) 0.98   55206.6   12410.00
     14    45078.25  123.92  0.30( 0.29) 0.98   58948.7   11201.00
     15    44584.01  128.90  0.30( 0.29) 0.98   60678.4   12201.00
     16    43495.41  135.99  0.30( 0.29) 0.98   62533.8   12231.00
     17    42125.82  143.86  0.30( 0.29) 0.98   64170.2   10400.00
     18    40705.29  151.86  0.30( 0.29) 0.98   65464.7   12010.00
```

```
     19    39476.49  157.89  0.30( 0.29) 0.98   65813.4   10210.00
     20    35085.31  186.30  0.30( 0.29) 0.98   66551.6   10100.00
    TOTAL AREA(ACRES) =     66551.6

****************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13701.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    167.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.11   CHANNEL SLOPE =  0.0015
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.17
  CHANNEL FLOW THRU SUBAREA(CFS) =   46359.49
  FLOW VELOCITY(FEET/SEC.) =  10.21   FLOW DEPTH(FEET) =  16.17
  TRAVEL TIME(MIN.) =   2.77   Tc(MIN.) =  108.77
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509102X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      262.56   23.20  0.30( 0.26) 0.87     167.7   10200.00
    TOTAL AREA(ACRES) =      167.7

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26658.49   21.25    2.115  0.30( 0.29) 0.98    4880.6   21100.00
      2    30360.77   31.26    1.672  0.30( 0.29) 0.98    8413.3   20700.00
      3    33126.59   39.68    1.454  0.30( 0.29) 0.98   11713.8   10100.00
      4    35614.16   46.75    1.337  0.30( 0.29) 0.98   15091.5   20300.00
      5    38708.80   59.11    1.182  0.30( 0.29) 0.97   21780.2   31400.00
      6    40394.63   69.17    1.110  0.30( 0.29) 0.97   27025.0   13100.00
      7    41101.24   76.24    1.063  0.30( 0.29) 0.97   30148.3   11801.00
      8    42514.23   86.89    0.991  0.30( 0.29) 0.97   35561.4   11530.00
      9    43341.49   91.18    0.965  0.30( 0.29) 0.97   38208.0   11701.00
     10    44998.43   99.67    0.928  0.30( 0.29) 0.97   43931.6   13500.00
     11    45940.34  104.58    0.907  0.30( 0.29) 0.97   47225.1   10800.00
```



```
     12    46359.49  108.77    0.889  0.30( 0.29) 0.97   50167.9   11130.00
     13    45813.15  118.39    0.847  0.30( 0.29) 0.98   55206.6   12410.00
     14    45078.25  126.71    0.826  0.30( 0.29) 0.98   58948.7   11201.00
     15    44584.01  131.71    0.816  0.30( 0.29) 0.98   60678.4   12201.00
     16    43495.41  138.82    0.801  0.30( 0.29) 0.98   62533.8   12231.00
     17    42125.82  146.72    0.784  0.30( 0.29) 0.98   64170.2   10400.00
     18    40705.29  154.75    0.768  0.30( 0.29) 0.98   65464.7   12010.00
     19    39476.49  160.81    0.755  0.30( 0.29) 0.98   65813.4   10210.00
     20    35085.31  189.32    0.705  0.30( 0.29) 0.98   66551.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      262.56   23.20    2.001  0.30( 0.26) 0.87     167.7   10200.00
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  13701.00 =    9099.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26914.59   21.25    2.115  0.30( 0.29) 0.98    5034.1   21100.00
      2    27644.46   23.20    2.001  0.30( 0.29) 0.98    5738.5   10200.00
      3    30573.68   31.26    1.672  0.30( 0.29) 0.98    8580.9   20700.00
      4    33306.62   39.68    1.454  0.30( 0.29) 0.98   11881.5   10100.00
      5    35776.41   46.75    1.337  0.30( 0.29) 0.97   15259.1   20300.00
      6    38847.73   59.11    1.182  0.30( 0.29) 0.97   21947.9   31400.00
      7    40522.71   69.17    1.110  0.30( 0.29) 0.97   27192.7   13100.00
      8    41222.15   76.24    1.063  0.30( 0.29) 0.97   30316.0   11801.00
      9    42624.31   86.89    0.991  0.30( 0.29) 0.97   35729.1   11530.00
     10    43447.64   91.18    0.965  0.30( 0.29) 0.97   38375.6   11701.00
     11    45099.04   99.67    0.928  0.30( 0.29) 0.97   44099.3   13500.00
     12    46037.73  104.58    0.907  0.30( 0.29) 0.97   47392.8   10800.00
     13    46454.14  108.77    0.889  0.30( 0.29) 0.97   50335.5   11130.00
     14    45901.51  118.39    0.847  0.30( 0.29) 0.98   55374.3   12410.00
     15    45163.45  126.71    0.826  0.30( 0.29) 0.98   59116.4   11201.00
     16    44667.63  131.71    0.816  0.30( 0.29) 0.98   60846.1   12201.00
     17    43576.80  138.82    0.801  0.30( 0.29) 0.98   62701.5   12231.00
     18    42204.72  146.72    0.784  0.30( 0.29) 0.98   64337.9   10400.00
     19    40781.66  154.75    0.768  0.30( 0.29) 0.98   65632.4   12010.00
     20    39550.96  160.81    0.755  0.30( 0.29) 0.98   65981.1   10210.00
     21    35152.25  189.32    0.705  0.30( 0.29) 0.98   66719.3   10100.00
    TOTAL AREA(ACRES) =     66719.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    46454.14  Tc(MIN.) =  108.772
  EFFECTIVE AREA(ACRES) =  50335.52  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    66719.3
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    165.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   192.72   CHANNEL SLOPE =  0.0103
```

```
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.43
  CHANNEL FLOW THRU SUBAREA(CFS) =   46454.14
  FLOW VELOCITY(FEET/SEC.) =  19.92   FLOW DEPTH(FEET) =   9.43
  TRAVEL TIME(MIN.) =   0.16   Tc(MIN.) =  108.93
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13720.00 =  126443.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.51  DOWNSTREAM(FEET) =    161.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2042.40   CHANNEL SLOPE =  0.0019
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.10
  CHANNEL FLOW THRU SUBAREA(CFS) =   46454.14
  FLOW VELOCITY(FEET/SEC.) =  11.16   FLOW DEPTH(FEET) =  15.10
  TRAVEL TIME(MIN.) =   3.05   Tc(MIN.) =  111.98
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509103X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      763.76   21.98  0.30( 0.28) 0.95     474.8   10300.00
    TOTAL AREA(ACRES) =      474.8

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26914.59   25.05    1.895  0.30( 0.29) 0.98    5034.1   21100.00
      2    27644.46   26.98    1.821  0.30( 0.29) 0.98    5738.5   10200.00
      3    30573.68   34.92    1.578  0.30( 0.29) 0.98    8580.9   20700.00
      4    33306.62   43.24    1.394  0.30( 0.29) 0.98   11881.5   10100.00
      5    35776.41   50.24    1.281  0.30( 0.29) 0.97   15259.1   20300.00
      6    38847.73   62.50    1.155  0.30( 0.29) 0.97   21947.9   31400.00
      7    40522.71   72.52    1.088  0.30( 0.29) 0.97   27192.7   13100.00
```



```
      8    41222.15   79.57    1.040  0.30( 0.29) 0.97   30316.0   11801.00
      9    42624.31   90.19    0.969  0.30( 0.29) 0.97   35729.1   11530.00
     10    43447.64   94.46    0.951  0.30( 0.29) 0.97   38375.6   11701.00
     11    45099.04  102.91    0.914  0.30( 0.29) 0.97   44099.3   13500.00
     12    46037.73  107.80    0.893  0.30( 0.29) 0.97   47392.8   10800.00
     13    46454.14  111.98    0.875  0.30( 0.29) 0.97   50335.5   11130.00
     14    45901.51  121.61    0.837  0.30( 0.29) 0.98   55374.3   12410.00
     15    45163.45  129.95    0.819  0.30( 0.29) 0.98   59116.4   11201.00
     16    44667.63  134.96    0.809  0.30( 0.29) 0.98   60846.1   12201.00
     17    43576.80  142.09    0.794  0.30( 0.29) 0.98   62701.5   12231.00
     18    42204.72  150.03    0.777  0.30( 0.29) 0.98   64337.9   10400.00
     19    40781.66  158.09    0.761  0.30( 0.29) 0.98   65632.4   12010.00
     20    39550.96  164.18    0.748  0.30( 0.29) 0.98   65981.1   10210.00
     21    35152.25  192.82    0.701  0.30( 0.29) 0.98   66719.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      763.76   21.98    2.072  0.30( 0.28) 0.95     474.8   10300.00
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  13740.00 =    8072.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26990.35   21.98    2.072  0.30( 0.29) 0.97    4892.2   10300.00
      2    27602.74   25.05    1.895  0.30( 0.29) 0.97    5508.9   21100.00
      3    28301.01   26.98    1.821  0.30( 0.29) 0.97    6213.3   10200.00
      4    31126.18   34.92    1.578  0.30( 0.29) 0.98    9055.7   20700.00
      5    33780.51   43.24    1.394  0.30( 0.29) 0.98   12356.3   10100.00
      6    36202.34   50.24    1.281  0.30( 0.29) 0.97   15733.9   20300.00
      7    39219.73   62.50    1.155  0.30( 0.29) 0.97   22422.6   31400.00
      8    40865.88   72.52    1.088  0.30( 0.29) 0.97   27667.4   13100.00
      9    41545.04   79.57    1.040  0.30( 0.29) 0.97   30790.7   11801.00
     10    42916.82   90.19    0.969  0.30( 0.29) 0.97   36203.9   11530.00
     11    43732.25   94.46    0.951  0.30( 0.29) 0.97   38850.4   11701.00
     12    45368.00  102.91    0.914  0.30( 0.29) 0.97   44574.1   13500.00
     13    46297.64  107.80    0.893  0.30( 0.29) 0.97   47867.6   10800.00
     14    46706.30  111.98    0.875  0.30( 0.29) 0.97   50810.3   11130.00
     15    46137.39  121.61    0.837  0.30( 0.29) 0.98   55849.0   12410.00
     16    45391.89  129.95    0.819  0.30( 0.29) 0.98   59591.1   11201.00
     17    44891.63  134.96    0.809  0.30( 0.29) 0.98   61320.9   12201.00
     18    43794.44  142.09    0.794  0.30( 0.29) 0.98   63176.2   12231.00
     19    42415.30  150.03    0.777  0.30( 0.29) 0.98   64812.6   10400.00
     20    40985.06  158.09    0.761  0.30( 0.29) 0.98   66107.2   12010.00
     21    39748.94  164.18    0.748  0.30( 0.29) 0.98   66455.9   10210.00
     22    35330.33  192.82    0.701  0.30( 0.29) 0.98   67194.1   10100.00
    TOTAL AREA(ACRES) =     67194.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    46706.30  Tc(MIN.) =  111.982
  EFFECTIVE AREA(ACRES) =  50810.28  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67194.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13741.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    161.63  DOWNSTREAM(FEET) =    141.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   389.20   CHANNEL SLOPE =  0.0530
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.56
  CHANNEL FLOW THRU SUBAREA(CFS) =   46706.30
  FLOW VELOCITY(FEET/SEC.) =  40.67   FLOW DEPTH(FEET) =   8.56
  TRAVEL TIME(MIN.) =   0.16   Tc(MIN.) =  112.14
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13741.00 =  128875.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13741.00 TO NODE  13802.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    141.00  DOWNSTREAM(FEET) =    135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1533.41   CHANNEL SLOPE =  0.0039
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  17.12
  CHANNEL FLOW THRU SUBAREA(CFS) =   46706.30
  FLOW VELOCITY(FEET/SEC.) =  16.20   FLOW DEPTH(FEET) =  17.12
  TRAVEL TIME(MIN.) =   1.58   Tc(MIN.) =  113.72
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
================================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509104X.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      761.98   30.47  0.30( 0.28) 0.94     599.8   10400.00
    TOTAL AREA(ACRES) =      599.8

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26990.35   24.02    1.954  0.30( 0.29) 0.97    4892.2   10300.00
```



```
      2    27602.74   27.08    1.817  0.30( 0.29) 0.97    5508.9   21100.00
      3    28301.01   28.98    1.744  0.30( 0.29) 0.97    6213.3   10200.00
      4    31126.18   36.87    1.527  0.30( 0.29) 0.98    9055.7   20700.00
      5    33780.51   45.14    1.363  0.30( 0.29) 0.98   12356.3   10100.00
      6    36202.34   52.10    1.260  0.30( 0.29) 0.97   15733.9   20300.00
      7    39219.73   64.33    1.143  0.30( 0.29) 0.97   22422.6   31400.00
      8    40865.88   74.33    1.076  0.30( 0.29) 0.97   27667.4   13100.00
      9    41545.04   81.36    1.028  0.30( 0.29) 0.97   30790.7   11801.00
     10    42916.82   91.97    0.961  0.30( 0.29) 0.97   36203.9   11530.00
     11    43732.25   96.23    0.943  0.30( 0.29) 0.97   38850.4   11701.00
     12    45368.00  104.66    0.906  0.30( 0.29) 0.97   44574.1   13500.00
     13    46297.64  109.54    0.885  0.30( 0.29) 0.97   47867.6   10800.00
     14    46706.30  113.72    0.867  0.30( 0.29) 0.97   50810.3   11130.00
     15    46137.39  123.35    0.833  0.30( 0.29) 0.98   55849.0   12410.00
     16    45391.89  131.70    0.816  0.30( 0.29) 0.98   59591.1   11201.00
     17    44891.63  136.71    0.805  0.30( 0.29) 0.98   61320.9   12201.00
     18    43794.44  143.86    0.790  0.30( 0.29) 0.98   63176.2   12231.00
     19    42415.30  151.81    0.774  0.30( 0.29) 0.98   64812.6   10400.00
     20    40985.06  159.89    0.757  0.30( 0.29) 0.98   66107.2   12010.00
     21    39748.94  166.00    0.744  0.30( 0.29) 0.98   66455.9   10210.00
     22    35330.33  194.70    0.699  0.30( 0.29) 0.98   67194.1   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      761.98   30.47    1.693  0.30( 0.28) 0.94     599.8   10400.00
LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  13802.00 =   12273.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    27702.14   24.02    1.954  0.30( 0.29) 0.97    5365.1   10300.00
    2    28339.56   27.08    1.817  0.30( 0.29) 0.97    6041.9   21100.00
    3    29052.14   28.98    1.744  0.30( 0.29) 0.97    6783.9   10200.00
    4    29594.23   30.47    1.693  0.30( 0.29) 0.97    7347.5   10400.00
    5    31798.59   36.87    1.527  0.30( 0.29) 0.97    9655.5   20700.00
    6    34364.23   45.14    1.363  0.30( 0.29) 0.97   12956.0   10100.00
    7    36730.86   52.10    1.260  0.30( 0.29) 0.97   16333.7   20300.00
    8    39684.77   64.33    1.143  0.30( 0.29) 0.97   23022.4   31400.00
    9    41294.56   74.33    1.076  0.30( 0.29) 0.97   28267.2   13100.00
   10    41948.14   81.36    1.028  0.30( 0.29) 0.97   31390.5   11801.00
   11    43283.93   91.97    0.961  0.30( 0.29) 0.97   36803.6   11530.00
   12    44089.38   96.23    0.943  0.30( 0.29) 0.97   39450.2   11701.00
   13    45705.41  104.66    0.906  0.30( 0.29) 0.97   45173.8   13500.00
   14    46623.64  109.54    0.885  0.30( 0.29) 0.97   48467.3   10800.00
   15    47022.52  113.72    0.867  0.30( 0.29) 0.97   51410.1   11130.00
   16    46435.14  123.35    0.833  0.30( 0.29) 0.97   56448.8   12410.00
   17    45680.25  131.70    0.816  0.30( 0.29) 0.98   60190.9   11201.00
   18    45174.36  136.71    0.805  0.30( 0.29) 0.98   61920.6   12201.00
   19    44069.12  143.86    0.790  0.30( 0.29) 0.98   63776.0   12231.00
   20    42681.04  151.81    0.774  0.30( 0.29) 0.98   65412.4   10400.00
   21    41241.72  159.89    0.757  0.30( 0.29) 0.98   66706.9   12010.00
   22    39998.72  166.00    0.744  0.30( 0.29) 0.98   67055.6   10210.00
   23    35555.94  194.70    0.699  0.30( 0.29) 0.98   67793.9   10100.00
 TOTAL AREA(ACRES) =     67793.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =    47022.52  Tc(MIN.) =  113.719
  EFFECTIVE AREA(ACRES) =  51410.06  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67793.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13803.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    135.00  DOWNSTREAM(FEET) =    133.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   207.23   CHANNEL SLOPE =  0.0097
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.59
  CHANNEL FLOW THRU SUBAREA(CFS) =   47022.52
  FLOW VELOCITY(FEET/SEC.) =  22.43   FLOW DEPTH(FEET) =  13.59
  TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =  113.87
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13803.00 =  130616.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13803.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    67793.9  TC(MIN.) =    113.87
  EFFECTIVE AREA(ACRES) =  51410.06  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.973
  PEAK FLOW RATE(CFS)   =   47022.52

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    27702.14   24.20    1.943  0.30( 0.29) 0.97    5365.1   10300.00
      2    28339.56   27.25    1.810  0.30( 0.29) 0.97    6041.9   21100.00
      3    29052.14   29.16    1.737  0.30( 0.29) 0.97    6783.9   10200.00
      4    29594.23   30.64    1.688  0.30( 0.29) 0.97    7347.5   10400.00
      5    31798.59   37.05    1.523  0.30( 0.29) 0.97    9655.5   20700.00
      6    34364.23   45.31    1.360  0.30( 0.29) 0.97   12956.0   10100.00
      7    36730.86   52.27    1.259  0.30( 0.29) 0.97   16333.7   20300.00
      8    39684.77   64.49    1.142  0.30( 0.29) 0.97   23022.4   31400.00
      9    41294.56   74.49    1.074  0.30( 0.29) 0.97   28267.2   13100.00
     10    41948.14   81.52    1.027  0.30( 0.29) 0.97   31390.5   11801.00
     11    43283.93   92.13    0.961  0.30( 0.29) 0.97   36803.6   11530.00
     12    44089.38   96.39    0.942  0.30( 0.29) 0.97   39450.2   11701.00
     13    45705.41  104.82    0.906  0.30( 0.29) 0.97   45173.8   13500.00
     14    46623.64  109.69    0.885  0.30( 0.29) 0.97   48467.3   10800.00
     15    47022.52  113.87    0.867  0.30( 0.29) 0.97   51410.1   11130.00
     16    46435.14  123.51    0.833  0.30( 0.29) 0.97   56448.8   12410.00
     17    45680.25  131.86    0.815  0.30( 0.29) 0.98   60190.9   11201.00
     18    45174.36  136.87    0.805  0.30( 0.29) 0.98   61920.6   12201.00
     19    44069.12  144.02    0.790  0.30( 0.29) 0.98   63776.0   12231.00
     20    42681.04  151.97    0.773  0.30( 0.29) 0.98   65412.4   10400.00
     21    41241.72  160.05    0.757  0.30( 0.29) 0.98   66706.9   12010.00
```



```
     22    39998.72  166.16    0.744  0.30( 0.29) 0.98   67055.6   10210.00
     23    35555.94  194.87    0.699  0.30( 0.29) 0.98   67793.9   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S38.DAT
  TIME/DATE OF STUDY: 10:47 09/12/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.224
   2)   10.00;  3.382
   3)   15.00;  2.607
   4)   20.00;  2.184
   5)   25.00;  1.895
   6)   30.00;  1.703
   7)   40.00;  1.444
   8)   50.00;  1.282
   9)   60.00;  1.170
  10)   90.00;  0.968
  11)  120.00;  0.838
  12)  180.00;  0.713
  13)  360.00;  0.522
  14) 1200.00;  0.227
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S37.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    29594.23   30.64  0.30( 0.29) 0.97    7347.5   10400.00
      2    31798.59   37.05  0.30( 0.29) 0.97    9655.5   20700.00
      3    34364.23   45.31  0.30( 0.29) 0.97   12956.0   10100.00
      4    36730.86   52.27  0.30( 0.29) 0.97   16333.7   20300.00
      5    39684.77   64.49  0.30( 0.29) 0.97   23022.4   31400.00
      6    41294.56   74.49  0.30( 0.29) 0.97   28267.2   13100.00
      7    41948.14   81.52  0.30( 0.29) 0.97   31390.5   11801.00
      8    43283.93   92.13  0.30( 0.29) 0.97   36803.6   11530.00
      9    44089.38   96.39  0.30( 0.29) 0.97   39450.2   11701.00
     10    45705.41  104.82  0.30( 0.29) 0.97   45173.8   13500.00
     11    46623.64  109.69  0.30( 0.29) 0.97   48467.3   10800.00
     12    47022.52  113.87  0.30( 0.29) 0.97   51410.1   11130.00
     13    46435.14  123.51  0.30( 0.29) 0.97   56448.8   12410.00
     14    45680.25  131.86  0.30( 0.29) 0.98   60190.9   11201.00
     15    45174.36  136.87  0.30( 0.29) 0.98   61920.6   12201.00
     16    44069.12  144.02  0.30( 0.29) 0.98   63776.0   12231.00
     17    42681.04  151.97  0.30( 0.29) 0.98   65412.4   10400.00
     18    41241.72  160.05  0.30( 0.29) 0.98   66706.9   12010.00
     19    39998.72  166.16  0.30( 0.29) 0.98   67055.6   10210.00
     20    35555.94  194.87  0.30( 0.29) 0.98   67793.9   10100.00
   TOTAL AREA(ACRES) =    67793.9

**************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    29594.23   30.64  0.30( 0.29) 0.97    7347.5   10400.00
      2    31798.59   37.05  0.30( 0.29) 0.97    9655.5   20700.00
      3    34364.23   45.31  0.30( 0.29) 0.97   12956.0   10100.00
      4    36730.86   52.27  0.30( 0.29) 0.97   16333.7   20300.00
      5    39684.77   64.49  0.30( 0.29) 0.97   23022.4   31400.00
      6    41294.56   74.49  0.30( 0.29) 0.97   28267.2   13100.00
      7    41948.14   81.52  0.30( 0.29) 0.97   31390.5   11801.00
      8    43283.93   92.13  0.30( 0.29) 0.97   36803.6   11530.00
      9    44089.38   96.39  0.30( 0.29) 0.97   39450.2   11701.00
     10    45705.41  104.82  0.30( 0.29) 0.97   45173.8   13500.00
     11    46623.64  109.69  0.30( 0.29) 0.97   48467.3   10800.00
     12    47022.52  113.87  0.30( 0.29) 0.97   51410.1   11130.00
     13    46435.14  123.51  0.30( 0.29) 0.97   56448.8   12410.00
     14    45680.25  131.86  0.30( 0.29) 0.98   60190.9   11201.00
     15    45174.36  136.87  0.30( 0.29) 0.98   61920.6   12201.00
     16    44069.12  144.02  0.30( 0.29) 0.98   63776.0   12231.00
     17    42681.04  151.97  0.30( 0.29) 0.98   65412.4   10400.00
     18    41241.72  160.05  0.30( 0.29) 0.98   66706.9   12010.00
```

```
     19    39998.72  166.16  0.30( 0.29) 0.98   67055.6   10210.00
     20    35555.94  194.87  0.30( 0.29) 0.98   67793.9   10100.00
    TOTAL AREA(ACRES) =     67793.9

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    140.00  DOWNSTREAM(FEET) =    137.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.91   CHANNEL SLOPE =  0.0032
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  18.03
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.860
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.70      0.30     0.983     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.983
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   47036.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.16
  AVERAGE FLOW DEPTH(FEET) =  18.03   TRAVEL TIME(MIN.) =   1.02
  Tc(MIN.) =  114.89
  SUBAREA AREA(ACRES) =    53.70       SUBAREA RUNOFF(CFS) =   27.32
  EFFECTIVE AREA(ACRES) =  51463.76     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    67847.6         PEAK FLOW RATE(CFS) =   47022.52
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  18.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 18.02   FLOW VELOCITY(FEET/SEC.) =  15.16
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13820.00 =  131542.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  114.89
  RAINFALL INTENSITY(INCH/HR) =   0.86
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   51463.76
  TOTAL STREAM AREA(ACRES) =   67847.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   47022.52

****************************************************************************
  FLOW PROCESS FROM NODE  13810.00 TO NODE  13811.00 IS CODE =  21
----------------------------------------------------------------------------
```



```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   648.54
  ELEVATION DATA: UPSTREAM(FEET) =    756.46  DOWNSTREAM(FEET) =    586.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.293
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.027
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.58      0.30     1.000     0   12.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.69
  TOTAL AREA(ACRES) =      5.58   PEAK FLOW RATE(CFS) =     13.69

****************************************************************************
  FLOW PROCESS FROM NODE  13811.00 TO NODE  13811.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    586.02  DOWNSTREAM(FEET) =    437.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =   696.28   CHANNEL SLOPE =  0.2130
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.739
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.79      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.26
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   1.85
  Tc(MIN.) =   14.15
  SUBAREA AREA(ACRES) =    14.79       SUBAREA RUNOFF(CFS) =   32.47
  EFFECTIVE AREA(ACRES) =     20.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      44.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   7.18
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13811.50 =    1344.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13811.50 TO NODE  13812.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    437.69  DOWNSTREAM(FEET) =    402.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   681.04   CHANNEL SLOPE =  0.0519
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.05
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.490
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.08
  AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   16.38
  SUBAREA AREA(ACRES) =    18.41       SUBAREA RUNOFF(CFS) =   36.29
  EFFECTIVE AREA(ACRES) =     38.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.8         PEAK FLOW RATE(CFS) =      76.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.15   FLOW VELOCITY(FEET/SEC.) =   5.41
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13812.00 =    2025.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13812.00 TO NODE  13813.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    402.36  DOWNSTREAM(FEET) =    259.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1282.56   CHANNEL SLOPE =  0.1112
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.254
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.87      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     101.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.66
  AVERAGE FLOW DEPTH(FEET) =   1.09   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   19.17
  SUBAREA AREA(ACRES) =    27.87       SUBAREA RUNOFF(CFS) =   50.08
  EFFECTIVE AREA(ACRES) =     66.65     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =     118.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   8.05
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13813.00 =    3308.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   259.72  DOWNSTREAM(FEET) =   137.00
  FLOW LENGTH(FEET) =  2412.88   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.57
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     118.29
  PIPE TRAVEL TIME(MIN.) =   1.78    Tc(MIN.) =   20.95
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13820.00 =    5721.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.95
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.129
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.54      0.30     0.570     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.570
  SUBAREA AREA(ACRES) =   82.54      SUBAREA RUNOFF(CFS) =  145.45
  EFFECTIVE AREA(ACRES) =    149.19   AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =      149.2       PEAK FLOW RATE(CFS) =     256.23

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.95
  RAINFALL INTENSITY(INCH/HR) =   2.13
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.74
  EFFECTIVE STREAM AREA(ACRES) =     149.19
  TOTAL STREAM AREA(ACRES) =     149.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     256.23

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	29594.23	31.81	1.656	0.30(0.29)	0.97	7401.2	10400.00
1	31798.59	38.18	1.491	0.30(0.29)	0.97	9709.2	20700.00
1	34364.23	46.42	1.340	0.30(0.29)	0.97	13009.7	10100.00
1	36730.86	53.36	1.244	0.30(0.29)	0.97	16387.4	20300.00
1	39684.77	65.56	1.133	0.30(0.29)	0.97	23076.1	31400.00
1	41294.56	75.54	1.065	0.30(0.29)	0.97	28320.9	13100.00
1	41948.14	82.58	1.018	0.30(0.29)	0.97	31444.2	11801.00
1	43283.93	93.17	0.954	0.30(0.29)	0.97	36857.3	11530.00
1	44089.38	97.43	0.936	0.30(0.29)	0.97	39503.9	11701.00
1	45705.41	105.84	0.899	0.30(0.29)	0.97	45227.5	13500.00
1	46623.64	110.71	0.878	0.30(0.29)	0.97	48521.0	10800.00
1	47022.52	114.89	0.860	0.30(0.29)	0.97	51463.8	11130.00
1	46435.14	124.53	0.829	0.30(0.29)	0.97	56502.5	12410.00
1	45680.25	132.89	0.811	0.30(0.29)	0.98	60244.6	11201.00
1	45174.36	137.90	0.801	0.30(0.29)	0.98	61974.3	12201.00
1	44069.12	145.06	0.786	0.30(0.29)	0.98	63829.7	12231.00
1	42681.04	153.02	0.769	0.30(0.29)	0.98	65466.1	10400.00
1	41241.72	161.11	0.752	0.30(0.29)	0.98	66760.6	12010.00
1	39998.72	167.23	0.740	0.30(0.29)	0.98	67109.3	10210.00
1	35555.94	195.97	0.696	0.30(0.29)	0.98	67847.6	10100.00
2	256.23	20.95	2.129	0.30(0.22)	0.74	149.2	13810.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26505.51	20.95	2.129	0.30(0.29)	0.97	5025.0	13810.00
2	29786.99	31.81	1.656	0.30(0.29)	0.97	7550.4	10400.00
3	31969.17	38.18	1.491	0.30(0.29)	0.97	9858.4	20700.00
4	34514.52	46.42	1.340	0.30(0.29)	0.97	13158.9	10100.00
5	36868.31	53.36	1.244	0.30(0.29)	0.97	16536.6	20300.00
6	39807.22	65.56	1.133	0.30(0.29)	0.97	23225.3	31400.00
7	41407.98	75.54	1.065	0.30(0.29)	0.96	28470.1	13100.00
8	42055.20	82.58	1.018	0.30(0.29)	0.96	31593.4	11801.00
9	43382.43	93.17	0.954	0.30(0.29)	0.97	37006.5	11530.00
10	44185.41	97.43	0.936	0.30(0.29)	0.97	39653.1	11701.00
11	45796.54	105.84	0.899	0.30(0.29)	0.97	45376.7	13500.00
12	46711.94	110.71	0.878	0.30(0.29)	0.97	48670.2	10800.00
13	47108.38	114.89	0.860	0.30(0.29)	0.97	51612.9	11130.00
14	46516.77	124.53	0.829	0.30(0.29)	0.97	56651.7	12410.00
15	45759.55	132.89	0.811	0.30(0.29)	0.97	60393.8	11201.00
16	45252.25	137.90	0.801	0.30(0.29)	0.97	62123.5	12201.00
17	44145.01	145.06	0.786	0.30(0.29)	0.98	63978.9	12231.00
18	42754.70	153.02	0.769	0.30(0.29)	0.98	65615.3	10400.00
19	41313.11	161.11	0.752	0.30(0.29)	0.98	66909.8	12010.00
20	40068.41	167.23	0.740	0.30(0.29)	0.98	67258.5	10210.00
21	35619.78	195.97	0.696	0.30(0.29)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 47108.38 Tc(MIN.) = 114.89
EFFECTIVE AREA(ACRES) = 51612.95 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 67996.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

****

FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 137.00 DOWNSTREAM(FEET) = 133.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1261.34 CHANNEL SLOPE = 0.0032
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 18.14
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.854
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.60	0.30	0.683	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47117.61
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.05
AVERAGE FLOW DEPTH(FEET) = 18.14 TRAVEL TIME(MIN.) = 1.40
Tc(MIN.) = 116.29
SUBAREA AREA(ACRES) = 31.60 SUBAREA RUNOFF(CFS) = 18.46
EFFECTIVE AREA(ACRES) = 51644.55 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 68028.3 PEAK FLOW RATE(CFS) = 47108.38
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 18.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 18.13 FLOW VELOCITY(FEET/SEC.) = 15.06
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

****

FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 116.29
RAINFALL INTENSITY(INCH/HR) = 0.85
AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97
EFFECTIVE STREAM AREA(ACRES) = 51644.55
TOTAL STREAM AREA(ACRES) = 68028.34
PEAK FLOW RATE(CFS) AT CONFLUENCE = 47108.38

****

FLOW PROCESS FROM NODE 13830.00 TO NODE 13831.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 744.71
ELEVATION DATA: UPSTREAM(FEET) = 1100.95 DOWNSTREAM(FEET) = 959.21

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.858
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.784
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.06      0.30     1.000     0   13.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.31
  TOTAL AREA(ACRES) =      5.06   PEAK FLOW RATE(CFS) =     11.31

****************************************************************************
  FLOW PROCESS FROM NODE  13831.00 TO NODE  13832.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    959.21  DOWNSTREAM(FEET) =    832.83
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1076.71   CHANNEL SLOPE =  0.1174
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.69
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.443
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.82
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   16.94
  SUBAREA AREA(ACRES) =    32.57       SUBAREA RUNOFF(CFS) =   62.82
  EFFECTIVE AREA(ACRES) =     37.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =      72.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   6.99
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13832.00 =    1821.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13832.00 TO NODE  13833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    832.83  DOWNSTREAM(FEET) =    572.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.58   CHANNEL SLOPE =  0.1382
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.139
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.23      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      99.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.18
  AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   3.84
  Tc(MIN.) =   20.78
  SUBAREA AREA(ACRES) =    32.23       SUBAREA RUNOFF(CFS) =   53.35
  EFFECTIVE AREA(ACRES) =     69.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.9         PEAK FLOW RATE(CFS) =     115.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.10   FLOW VELOCITY(FEET/SEC.) =   8.59
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13833.00 =    3705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13833.00 TO NODE  13834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    572.49  DOWNSTREAM(FEET) =    471.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.78   CHANNEL SLOPE =  0.1068
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.030
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     137.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.31
  AVERAGE FLOW DEPTH(FEET) =   1.31   TRAVEL TIME(MIN.) =   1.89
  Tc(MIN.) =   22.67
  SUBAREA AREA(ACRES) =    27.51       SUBAREA RUNOFF(CFS) =   42.83
  EFFECTIVE AREA(ACRES) =     97.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =     151.58
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOW VELOCITY(FEET/SEC.) =   8.58
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13834.00 =    4648.78 FEET.
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****************************************************************************
  FLOW PROCESS FROM NODE  13834.00 TO NODE  13835.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    471.65  DOWNSTREAM(FEET) =    347.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1647.45   CHANNEL SLOPE =  0.0756
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.861
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     217.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.51
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   3.23
  Tc(MIN.) =   25.90
  SUBAREA AREA(ACRES) =    94.21       SUBAREA RUNOFF(CFS) =  132.32
  EFFECTIVE AREA(ACRES) =    191.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      191.6         PEAK FLOW RATE(CFS) =     269.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.09   FLOW VELOCITY(FEET/SEC.) =   9.06
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13835.00 =    6296.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13835.00 TO NODE  13836.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    347.06  DOWNSTREAM(FEET) =    269.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1696.71   CHANNEL SLOPE =  0.0458
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.09
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.734
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      233.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     419.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.61
  AVERAGE FLOW DEPTH(FEET) =   3.03   TRAVEL TIME(MIN.) =   3.28
  Tc(MIN.) =   29.18
  SUBAREA AREA(ACRES) =   233.25       SUBAREA RUNOFF(CFS) =  301.14
  EFFECTIVE AREA(ACRES) =    424.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
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  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      424.8         PEAK FLOW RATE(CFS) =     548.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.48   FLOW VELOCITY(FEET/SEC.) =   9.28
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13836.00 =    7992.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13836.00 TO NODE  13837.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    269.29  DOWNSTREAM(FEET) =    191.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2529.21   CHANNEL SLOPE =  0.0306
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.16
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.593
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.70      0.30     0.880     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     629.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.31
  AVERAGE FLOW DEPTH(FEET) =   4.14   TRAVEL TIME(MIN.) =   5.07
  Tc(MIN.) =   34.25
  SUBAREA AREA(ACRES) =   134.70       SUBAREA RUNOFF(CFS) =  161.11
  EFFECTIVE AREA(ACRES) =    559.53     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      559.5         PEAK FLOW RATE(CFS) =     655.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.23   FLOW VELOCITY(FEET/SEC.) =   8.40
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13837.00 =   10522.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   191.87  DOWNSTREAM(FEET) =   133.00
  FLOW LENGTH(FEET) =  1151.02   MANNING'S N =  0.013
  DEPTH OF FLOW IN  66.0 INCH PIPE IS  49.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.36
  ESTIMATED PIPE DIAMETER(INCH) =  66.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     655.45
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =   34.81
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13840.00 =   11673.17 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   34.81
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.578
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.97      0.30     0.622     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.622
  SUBAREA AREA(ACRES) =    5.97      SUBAREA RUNOFF(CFS) =    7.48
  EFFECTIVE AREA(ACRES) =    565.50   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =      565.5       PEAK FLOW RATE(CFS) =     655.65

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.81
  RAINFALL INTENSITY(INCH/HR) =   1.58
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     565.50
  TOTAL STREAM AREA(ACRES) =     565.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     655.65

  ** CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26505.51   22.60    2.034  0.30( 0.29) 0.96    5056.6   13810.00
      1    29786.99   33.39    1.615  0.30( 0.29) 0.97    7582.0   10400.00
      1    31969.17   39.74    1.451  0.30( 0.29) 0.97    9890.0   20700.00
      1    34514.52   47.95    1.315  0.30( 0.29) 0.97   13190.5   10100.00
      1    36868.31   54.86    1.228  0.30( 0.29) 0.97   16568.2   20300.00
      1    39807.22   67.02    1.123  0.30( 0.29) 0.97   23256.9   31400.00
      1    41407.98   76.99    1.056  0.30( 0.29) 0.96   28501.7   13100.00
      1    42055.20   84.02    1.008  0.30( 0.29) 0.96   31625.0   11801.00
      1    43382.43   94.60    0.948  0.30( 0.29) 0.97   37038.1   11530.00
      1    44185.41   98.85    0.930  0.30( 0.29) 0.97   39684.7   11701.00
      1    45796.54  107.25    0.893  0.30( 0.29) 0.97   45408.3   13500.00
      1    46711.94  112.11    0.872  0.30( 0.29) 0.97   48701.8   10800.00
      1    47108.38  116.29    0.854  0.30( 0.29) 0.97   51644.6   11130.00
      1    46516.77  125.93    0.826  0.30( 0.29) 0.97   56683.3   12410.00
      1    45759.55  134.29    0.808  0.30( 0.29) 0.97   60425.4   11201.00
      1    45252.25  139.31    0.798  0.30( 0.29) 0.97   62155.1   12201.00
      1    44145.01  146.48    0.783  0.30( 0.29) 0.97   64010.5   12231.00
      1    42754.70  154.45    0.766  0.30( 0.29) 0.98   65646.9   10400.00
      1    41313.11  162.56    0.749  0.30( 0.29) 0.98   66941.4   12010.00
```



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      1    40068.41  168.69    0.737  0.30( 0.29) 0.98   67290.1   10210.00
      1    35619.78  197.48    0.694  0.30( 0.29) 0.98   68028.3   10100.00
      2      655.65   34.81    1.578  0.30( 0.29) 0.97     565.5   13830.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    27081.61   22.60    2.034  0.30( 0.29) 0.96    5423.7   13810.00
      2    30433.88   33.39    1.615  0.30( 0.29) 0.97    8124.5   10400.00
      3    30929.51   34.81    1.578  0.30( 0.29) 0.97    8662.5   13830.00
      4    32559.84   39.74    1.451  0.30( 0.29) 0.97   10455.5   20700.00
      5    35036.25   47.95    1.315  0.30( 0.29) 0.97   13756.0   10100.00
      6    37345.43   54.86    1.228  0.30( 0.29) 0.97   17133.7   20300.00
      7    40230.96   67.02    1.123  0.30( 0.29) 0.97   23822.4   31400.00
      8    41797.55   76.99    1.056  0.30( 0.29) 0.96   29067.2   13100.00
      9    42420.69   84.02    1.008  0.30( 0.29) 0.96   32190.5   11801.00
     10    43717.28   94.60    0.948  0.30( 0.29) 0.97   37603.6   11530.00
     11    44510.88   98.85    0.930  0.30( 0.29) 0.97   40250.2   11701.00
     12    46103.48  107.25    0.893  0.30( 0.29) 0.97   45973.8   13500.00
     13    47008.15  112.11    0.872  0.30( 0.29) 0.97   49267.3   10800.00
     14    47395.39  116.29    0.854  0.30( 0.29) 0.97   52210.1   11130.00
     15    46789.30  125.93    0.826  0.30( 0.29) 0.97   57248.8   12410.00
     16    46023.21  134.29    0.808  0.30( 0.29) 0.97   60990.9   11201.00
     17    45510.59  139.31    0.798  0.30( 0.29) 0.97   62720.6   12201.00
     18    44395.75  146.48    0.783  0.30( 0.29) 0.97   64576.0   12231.00
     19    42997.00  154.45    0.766  0.30( 0.29) 0.98   66212.4   10400.00
     20    41546.81  162.56    0.749  0.30( 0.29) 0.98   67506.9   12010.00
     21    40295.60  168.69    0.737  0.30( 0.29) 0.98   67855.6   10210.00
     22    35825.54  197.48    0.694  0.30( 0.29) 0.98   68593.8   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   47395.39    Tc(MIN.) =   116.29
  EFFECTIVE AREA(ACRES) =   52210.05   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68593.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13840.00 =  132804.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13840.00 TO NODE  13860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    133.00  DOWNSTREAM(FEET) =    130.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.44   CHANNEL SLOPE =  0.0046
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.56
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.851
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.61      0.30     0.975     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.975
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   47397.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.22
  AVERAGE FLOW DEPTH(FEET) =  16.56   TRAVEL TIME(MIN.) =   0.63
  Tc(MIN.) =  116.92
  SUBAREA AREA(ACRES) =     6.61       SUBAREA RUNOFF(CFS) =    3.32
  EFFECTIVE AREA(ACRES) =  52216.66     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    68600.5         PEAK FLOW RATE(CFS) =   47395.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 16.56   FLOW VELOCITY(FEET/SEC.) =  17.22
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13860.00 =  133458.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13840.00 TO NODE  13860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  116.92
  RAINFALL INTENSITY(INCH/HR) =   0.85
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52216.66
  TOTAL STREAM AREA(ACRES) =   68600.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   47395.39

****************************************************************************
  FLOW PROCESS FROM NODE  13850.00 TO NODE  13851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   617.57
  ELEVATION DATA: UPSTREAM(FEET) =    646.95  DOWNSTREAM(FEET) =    490.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.137
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.051
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        4.95      0.30     1.000     0   12.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.25
  TOTAL AREA(ACRES) =      4.95   PEAK FLOW RATE(CFS) =     12.25

****************************************************************************
  FLOW PROCESS FROM NODE  13851.00 TO NODE  13851.50 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.10  DOWNSTREAM(FEET) =    440.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   351.14   CHANNEL SLOPE =  0.1399
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.846
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.43
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   1.32
  Tc(MIN.) =   13.46
  SUBAREA AREA(ACRES) =     4.02       SUBAREA RUNOFF(CFS) =    9.21
  EFFECTIVE AREA(ACRES) =      8.97     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.0         PEAK FLOW RATE(CFS) =      20.55
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   4.74
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13851.50 =     968.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13851.50 TO NODE  13852.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    440.98  DOWNSTREAM(FEET) =    395.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.91   CHANNEL SLOPE =  0.0882
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.56
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.578
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.17      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.55
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   1.88
  Tc(MIN.) =   15.34
  SUBAREA AREA(ACRES) =     7.17       SUBAREA RUNOFF(CFS) =   14.70
  EFFECTIVE AREA(ACRES) =     16.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       16.1         PEAK FLOW RATE(CFS) =      33.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

```
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   4.86
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13852.00 =    1481.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13852.00 TO NODE  13853.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    395.76  DOWNSTREAM(FEET) =    354.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   443.69   CHANNEL SLOPE =  0.0920
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.67
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.459
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.76      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.23
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   1.41
  Tc(MIN.) =   16.75
  SUBAREA AREA(ACRES) =     6.76       SUBAREA RUNOFF(CFS) =   13.14
  EFFECTIVE AREA(ACRES) =     22.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.9         PEAK FLOW RATE(CFS) =      44.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =   5.45
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13853.00 =    1925.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13853.00 TO NODE  13854.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    354.94  DOWNSTREAM(FEET) =    263.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.09   CHANNEL SLOPE =  0.0950
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.237
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.12
  AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =   2.62
  Tc(MIN.) =   19.37
  SUBAREA AREA(ACRES) =    18.16       SUBAREA RUNOFF(CFS) =   31.66
  EFFECTIVE AREA(ACRES) =     41.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.1         PEAK FLOW RATE(CFS) =      71.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   6.46
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13854.00 =    2887.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13854.00 TO NODE  13855.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    263.57  DOWNSTREAM(FEET) =    188.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1228.77   CHANNEL SLOPE =  0.0609
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.031
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.75      0.30     0.879     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.879
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     102.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.25
  AVERAGE FLOW DEPTH(FEET) =   1.30   TRAVEL TIME(MIN.) =   3.27
  Tc(MIN.) =   22.65
  SUBAREA AREA(ACRES) =    38.75       SUBAREA RUNOFF(CFS) =   61.64
  EFFECTIVE AREA(ACRES) =     79.81     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       79.8         PEAK FLOW RATE(CFS) =     125.61
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.46   FLOW VELOCITY(FEET/SEC.) =   6.66
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13855.00 =    4116.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   188.74  DOWNSTREAM(FEET) =   130.00
```

```
  FLOW LENGTH(FEET) =  2092.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.01
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     125.61
  PIPE TRAVEL TIME(MIN.) =   1.94    Tc(MIN.) =   24.58
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13860.00 =    6208.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.58
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.919
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.41      0.30     0.707     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.707
  SUBAREA AREA(ACRES) =   43.41      SUBAREA RUNOFF(CFS) =   66.69
  EFFECTIVE AREA(ACRES) =    123.22   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      123.2       PEAK FLOW RATE(CFS) =     184.26

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.58
  RAINFALL INTENSITY(INCH/HR) =   1.92
  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.86
  EFFECTIVE STREAM AREA(ACRES) =     123.22
  TOTAL STREAM AREA(ACRES) =     123.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     184.26

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    27081.61   23.34    1.991  0.30( 0.29) 0.96    5430.3   13810.00
      1    30433.88   34.11    1.596  0.30( 0.29) 0.97    8131.1   10400.00
      1    30929.51   35.53    1.560  0.30( 0.29) 0.97    8669.1   13830.00
      1    32559.84   40.45    1.437  0.30( 0.29) 0.97   10462.1   20700.00
      1    35036.25   48.64    1.304  0.30( 0.29) 0.97   13762.6   10100.00
      1    37345.43   55.53    1.220  0.30( 0.29) 0.97   17140.3   20300.00
      1    40230.96   67.68    1.118  0.30( 0.29) 0.97   23829.0   31400.00
      1    41797.55   77.65    1.051  0.30( 0.29) 0.96   29073.8   13100.00
      1    42420.69   84.67    1.004  0.30( 0.29) 0.96   32197.1   11801.00
      1    43717.28   95.25    0.945  0.30( 0.29) 0.97   37610.2   11530.00
      1    44510.88   99.49    0.927  0.30( 0.29) 0.97   40256.8   11701.00
      1    46103.48  107.89    0.890  0.30( 0.29) 0.97   45980.4   13500.00
```



```
      1    47008.15  112.75    0.869  0.30( 0.29) 0.97   49273.9   10800.00
      1    47395.39  116.92    0.851  0.30( 0.29) 0.97   52216.7   11130.00
      1    46789.30  126.57    0.824  0.30( 0.29) 0.97   57255.4   12410.00
      1    46023.21  134.93    0.807  0.30( 0.29) 0.97   60997.5   11201.00
      1    45510.59  139.95    0.796  0.30( 0.29) 0.97   62727.2   12201.00
      1    44395.75  147.12    0.781  0.30( 0.29) 0.97   64582.6   12231.00
      1    42997.00  155.10    0.765  0.30( 0.29) 0.98   66219.0   10400.00
      1    41546.81  163.22    0.748  0.30( 0.29) 0.98   67513.5   12010.00
      1    40295.60  169.35    0.735  0.30( 0.29) 0.98   67862.2   10210.00
      1    35825.54  198.17    0.694  0.30( 0.29) 0.98   68600.5   10100.00
      2      184.26   24.58    1.919  0.30( 0.26) 0.86     123.2   13850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    27264.12   23.34    1.991  0.30( 0.29) 0.96    5547.3   13810.00
      2    27652.51   24.58    1.919  0.30( 0.29) 0.96    5865.0   13850.00
      3    30582.36   34.11    1.596  0.30( 0.29) 0.96    8254.4   10400.00
      4    31073.93   35.53    1.560  0.30( 0.29) 0.97    8792.3   13830.00
      5    32690.61   40.45    1.437  0.30( 0.29) 0.97   10585.3   20700.00
      6    35152.31   48.64    1.304  0.30( 0.29) 0.97   13885.9   10100.00
      7    37452.16   55.53    1.220  0.30( 0.29) 0.97   17263.5   20300.00
      8    40326.41   67.68    1.118  0.30( 0.29) 0.97   23952.2   31400.00
      9    41885.56   77.65    1.051  0.30( 0.29) 0.96   29197.0   13100.00
     10    42503.46   84.67    1.004  0.30( 0.29) 0.96   32320.3   11801.00
     11    43793.54   95.25    0.945  0.30( 0.29) 0.96   37733.5   11530.00
     12    44585.11   99.49    0.927  0.30( 0.29) 0.97   40380.0   11701.00
     13    46173.68  107.89    0.890  0.30( 0.29) 0.97   46103.7   13500.00
     14    47076.01  112.75    0.869  0.30( 0.29) 0.97   49397.2   10800.00
     15    47461.24  116.92    0.851  0.30( 0.29) 0.97   52339.9   11130.00
     16    46852.16  126.57    0.824  0.30( 0.29) 0.97   57378.6   12410.00
     17    46084.13  134.93    0.807  0.30( 0.29) 0.97   61120.7   11201.00
     18    45570.36  139.95    0.796  0.30( 0.29) 0.97   62850.5   12201.00
     19    44453.86  147.12    0.781  0.30( 0.29) 0.97   64705.8   12231.00
     20    43053.26  155.10    0.765  0.30( 0.29) 0.97   66342.2   10400.00
     21    41601.20  163.22    0.748  0.30( 0.29) 0.98   67636.8   12010.00
     22    40348.57  169.35    0.735  0.30( 0.29) 0.98   67985.5   10210.00
     23    35873.91  198.17    0.694  0.30( 0.29) 0.98   68723.7   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   47461.24    Tc(MIN.) =   116.92
  EFFECTIVE AREA(ACRES) =   52339.88   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68723.7
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13860.00 =  133458.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13860.00 TO NODE  13880.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    130.00  DOWNSTREAM(FEET) =    120.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   610.77   CHANNEL SLOPE =  0.0154
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
```

```
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.06
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.850
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   47462.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  26.56
  AVERAGE FLOW DEPTH(FEET) =  12.06   TRAVEL TIME(MIN.) =   0.38
  Tc(MIN.) =  117.31
  SUBAREA AREA(ACRES) =     4.89       SUBAREA RUNOFF(CFS) =    2.42
  EFFECTIVE AREA(ACRES) =  52344.77     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    68728.6         PEAK FLOW RATE(CFS) =   47461.24
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.06   FLOW VELOCITY(FEET/SEC.) =  26.56
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13880.00 =  134069.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13860.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  117.31
  RAINFALL INTENSITY(INCH/HR) =   0.85
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52344.77
  TOTAL STREAM AREA(ACRES) =   68728.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   47461.24

****************************************************************************
  FLOW PROCESS FROM NODE  13870.00 TO NODE  13871.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   872.65
  ELEVATION DATA: UPSTREAM(FEET) =    558.52  DOWNSTREAM(FEET) =    436.47

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.704
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.547
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
```



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  "GRASS"                    -        9.32      0.30     1.000     0   15.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     18.85
  TOTAL AREA(ACRES) =      9.32   PEAK FLOW RATE(CFS) =     18.85

****************************************************************************
  FLOW PROCESS FROM NODE  13871.00 TO NODE  13872.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.47  DOWNSTREAM(FEET) =    337.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =   827.95   CHANNEL SLOPE =  0.1194
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.56
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.326
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.28
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   2.61
  Tc(MIN.) =   18.32
  SUBAREA AREA(ACRES) =    14.27       SUBAREA RUNOFF(CFS) =   26.03
  EFFECTIVE AREA(ACRES) =     23.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =      43.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   5.84
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13872.00 =    1700.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13872.00 TO NODE  13873.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    337.62  DOWNSTREAM(FEET) =    253.88
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1049.16   CHANNEL SLOPE =  0.0798
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.01
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.116
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.74      0.30     0.923     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.923
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      72.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.13
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =   2.85
  Tc(MIN.) =   21.17
  SUBAREA AREA(ACRES) =    35.74       SUBAREA RUNOFF(CFS) =   59.17
  EFFECTIVE AREA(ACRES) =     59.33     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =       59.3         PEAK FLOW RATE(CFS) =      97.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   6.76
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13873.00 =    2749.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13873.00 TO NODE  13874.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    253.88  DOWNSTREAM(FEET) =    160.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1518.60   CHANNEL SLOPE =  0.0613
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.15
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.949
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.43      0.30     0.900     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     122.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.74
  AVERAGE FLOW DEPTH(FEET) =   1.14   TRAVEL TIME(MIN.) =   2.90
  Tc(MIN.) =   24.07
  SUBAREA AREA(ACRES) =    32.43       SUBAREA RUNOFF(CFS) =   49.01
  EFFECTIVE AREA(ACRES) =     91.76     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       91.8         PEAK FLOW RATE(CFS) =     137.81
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   9.10
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13874.00 =    4268.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13874.00 TO NODE  13875.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    160.73  DOWNSTREAM(FEET) =    158.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   582.74   CHANNEL SLOPE =  0.0044
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.01
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.837
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.67      0.30     0.930     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.930
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     189.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.98
  AVERAGE FLOW DEPTH(FEET) =   2.98   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =   26.50
  SUBAREA AREA(ACRES) =    73.67       SUBAREA RUNOFF(CFS) =  103.32
  EFFECTIVE AREA(ACRES) =    165.43     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =      165.4         PEAK FLOW RATE(CFS) =     231.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.31   FLOW VELOCITY(FEET/SEC.) =   4.21
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13875.00 =    4851.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.14  DOWNSTREAM(FEET) =   120.57
  FLOW LENGTH(FEET) =  1855.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  39.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.81
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     231.90
  PIPE TRAVEL TIME(MIN.) =   1.64    Tc(MIN.) =   28.15
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13880.00 =    6706.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   28.15
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  1.774
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.90      0.30     0.743     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.743
  SUBAREA AREA(ACRES) =   34.90       SUBAREA RUNOFF(CFS) =   48.73
  EFFECTIVE AREA(ACRES) =    200.33   AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.90
  TOTAL AREA(ACRES) =      200.3       PEAK FLOW RATE(CFS) =     271.23
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.15
  RAINFALL INTENSITY(INCH/HR) =   1.77
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.90
  EFFECTIVE STREAM AREA(ACRES) =     200.33
  TOTAL STREAM AREA(ACRES) =     200.33
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     271.23

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    27264.12   23.79    1.965  0.30( 0.29) 0.96    5552.2   13810.00
      1    27652.51   25.03    1.894  0.30( 0.29) 0.96    5869.9   13850.00
      1    30582.36   34.55    1.585  0.30( 0.29) 0.96    8259.3   10400.00
      1    31073.93   35.96    1.549  0.30( 0.29) 0.97    8797.2   13830.00
      1    32690.61   40.87    1.430  0.30( 0.29) 0.97   10590.2   20700.00
      1    35152.31   49.06    1.297  0.30( 0.29) 0.97   13890.8   10100.00
      1    37452.16   55.94    1.215  0.30( 0.29) 0.97   17268.4   20300.00
      1    40326.41   68.08    1.116  0.30( 0.29) 0.97   23957.1   31400.00
      1    41885.56   78.04    1.049  0.30( 0.29) 0.96   29201.9   13100.00
      1    42503.46   85.07    1.001  0.30( 0.29) 0.96   32325.2   11801.00
      1    43793.54   95.64    0.944  0.30( 0.29) 0.96   37738.4   11530.00
      1    44585.11   99.88    0.925  0.30( 0.29) 0.97   40384.9   11701.00
      1    46173.68  108.27    0.889  0.30( 0.29) 0.97   46108.5   13500.00
      1    47076.01  113.13    0.868  0.30( 0.29) 0.97   49402.1   10800.00
      1    47461.24  117.31    0.850  0.30( 0.29) 0.97   52344.8   11130.00
      1    46852.16  126.95    0.824  0.30( 0.29) 0.97   57383.5   12410.00
      1    46084.13  135.32    0.806  0.30( 0.29) 0.97   61125.6   11201.00
      1    45570.36  140.34    0.796  0.30( 0.29) 0.97   62855.3   12201.00
      1    44453.86  147.51    0.781  0.30( 0.29) 0.97   64710.7   12231.00
      1    43053.26  155.50    0.764  0.30( 0.29) 0.97   66347.1   10400.00
      1    41601.20  163.61    0.747  0.30( 0.29) 0.98   67641.7   12010.00
      1    40348.57  169.75    0.734  0.30( 0.29) 0.98   67990.4   10210.00
      1    35873.91  198.59    0.693  0.30( 0.29) 0.98   68728.6   10100.00
      2      271.23   28.15    1.774  0.30( 0.27) 0.90     200.3   13870.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    27522.44   23.79    1.965  0.30( 0.29) 0.96    5721.5   13810.00
      2    27912.91   25.03    1.894  0.30( 0.29) 0.96    6048.1   13850.00
      3    28882.42   28.15    1.774  0.30( 0.29) 0.96    6852.1   13870.00
      4    30819.51   34.55    1.585  0.30( 0.29) 0.96    8459.6   10400.00
      5    31304.50   35.96    1.549  0.30( 0.29) 0.96    8997.5   13830.00
      6    32899.76   40.87    1.430  0.30( 0.29) 0.97   10790.5   20700.00
```



```
      7    35337.56   49.06    1.297  0.30( 0.29) 0.97   14091.1   10100.00
      8    37622.66   55.94    1.215  0.30( 0.29) 0.97   17468.7   20300.00
      9    40478.90   68.08    1.116  0.30( 0.29) 0.96   24157.4   31400.00
     10    42025.95   78.04    1.049  0.30( 0.29) 0.96   29402.2   13100.00
     11    42635.33   85.07    1.001  0.30( 0.29) 0.96   32525.5   11801.00
     12    43915.02   95.64    0.944  0.30( 0.29) 0.96   37938.7   11530.00
     13    44703.27   99.88    0.925  0.30( 0.29) 0.97   40585.2   11701.00
     14    46285.28  108.27    0.889  0.30( 0.29) 0.97   46308.9   13500.00
     15    47183.82  113.13    0.868  0.30( 0.29) 0.97   49602.4   10800.00
     16    47565.79  117.31    0.850  0.30( 0.29) 0.97   52545.1   11130.00
     17    46951.99  126.95    0.824  0.30( 0.29) 0.97   57583.8   12410.00
     18    46180.82  135.32    0.806  0.30( 0.29) 0.97   61326.0   11201.00
     19    45665.16  140.34    0.796  0.30( 0.29) 0.97   63055.7   12201.00
     20    44545.96  147.51    0.781  0.30( 0.29) 0.97   64911.1   12231.00
     21    43142.37  155.50    0.764  0.30( 0.29) 0.97   66547.5   10400.00
     22    41687.26  163.61    0.747  0.30( 0.29) 0.98   67842.0   12010.00
     23    40432.32  169.75    0.734  0.30( 0.29) 0.98   68190.7   10210.00
     24    35950.26  198.59    0.693  0.30( 0.29) 0.98   68928.9   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   47565.79    Tc(MIN.) =   117.31
  EFFECTIVE AREA(ACRES) =   52545.10   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68928.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13880.00 =  134069.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    120.57  DOWNSTREAM(FEET) =    119.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1190.21   CHANNEL SLOPE =  0.0007
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  26.24
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.840
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.69      0.30     0.724     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.724
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   47598.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.85
  AVERAGE FLOW DEPTH(FEET) =  26.23   TRAVEL TIME(MIN.) =   2.24
  Tc(MIN.) =  119.55
  SUBAREA AREA(ACRES) =   117.69       SUBAREA RUNOFF(CFS) =   65.97
  EFFECTIVE AREA(ACRES) =  52662.79     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69046.6         PEAK FLOW RATE(CFS) =   47565.79
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  26.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) = 26.23   FLOW VELOCITY(FEET/SEC.) =   8.85
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13910.00 =  135259.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  119.55
  RAINFALL INTENSITY(INCH/HR) =   0.84
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52662.79
  TOTAL STREAM AREA(ACRES) =   69046.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   47565.79

****************************************************************************
  FLOW PROCESS FROM NODE  13889.00 TO NODE  13890.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   447.89
  ELEVATION DATA: UPSTREAM(FEET) =    564.89  DOWNSTREAM(FEET) =    421.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.976
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  4.496
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK               -        3.03      0.30     0.960     0    6.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.960
  SUBAREA RUNOFF(CFS) =     11.48
  TOTAL AREA(ACRES) =      3.03   PEAK FLOW RATE(CFS) =     11.48

****************************************************************************
  FLOW PROCESS FROM NODE  13890.00 TO NODE  13891.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    421.92  DOWNSTREAM(FEET) =    392.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   435.33   CHANNEL SLOPE =  0.0673
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.985
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        8.12      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.23
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   1.39
  Tc(MIN.) =    8.36
  SUBAREA AREA(ACRES) =     8.12       SUBAREA RUNOFF(CFS) =   26.96
  EFFECTIVE AREA(ACRES) =     11.15     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       11.1         PEAK FLOW RATE(CFS) =      37.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   6.02
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13891.00 =     883.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13891.00 TO NODE  13892.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    392.64  DOWNSTREAM(FEET) =    324.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =   662.40   CHANNEL SLOPE =  0.1029
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.64
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.473
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       12.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.95
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   1.39
  Tc(MIN.) =    9.75
  SUBAREA AREA(ACRES) =    12.50       SUBAREA RUNOFF(CFS) =   35.70
  EFFECTIVE AREA(ACRES) =     23.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =      67.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   8.51
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13892.00 =    1545.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13892.00 TO NODE  13893.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    324.46  DOWNSTREAM(FEET) =    240.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   980.03   CHANNEL SLOPE =  0.0853
```

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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.131
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      87.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.75
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   1.87
  Tc(MIN.) =   11.62
  SUBAREA AREA(ACRES) =    15.87       SUBAREA RUNOFF(CFS) =   40.43
  EFFECTIVE AREA(ACRES) =     39.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       39.5         PEAK FLOW RATE(CFS) =     100.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.93   FLOW VELOCITY(FEET/SEC.) =   9.18
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13893.00 =    2525.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13893.00 TO NODE  13894.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.82  DOWNSTREAM(FEET) =    163.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1144.35   CHANNEL SLOPE =  0.0680
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.812
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.41      0.30     0.985     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.985
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     132.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.28
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =   13.68
  SUBAREA AREA(ACRES) =    28.41       SUBAREA RUNOFF(CFS) =   64.35
  EFFECTIVE AREA(ACRES) =     67.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =     153.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   9.73
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  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13894.00 =    3670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   163.04  DOWNSTREAM(FEET) =   119.70
  FLOW LENGTH(FEET) =  1899.01   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.73
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     153.78
  PIPE TRAVEL TIME(MIN.) =   1.79    Tc(MIN.) =   15.46
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13910.00 =    5569.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.46
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.568
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.69      0.30     0.634     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.634
  SUBAREA AREA(ACRES) =   11.69      SUBAREA RUNOFF(CFS) =   25.02
  EFFECTIVE AREA(ACRES) =     79.62   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.94
  TOTAL AREA(ACRES) =       79.6       PEAK FLOW RATE(CFS) =     163.86

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.46
  RAINFALL INTENSITY(INCH/HR) =   2.57
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.94
  EFFECTIVE STREAM AREA(ACRES) =      79.62
  TOTAL STREAM AREA(ACRES) =      79.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     163.86

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    27522.44   26.39    1.842  0.30( 0.29) 0.95    5839.2   13810.00
      1    27912.91   27.62    1.794  0.30( 0.29) 0.96    6165.8   13850.00
      1    28882.42   30.71    1.685  0.30( 0.29) 0.96    6969.8   13870.00
```

1	30819.51	37.07	1.520	0.30(0.29)	0.96	8577.3	10400.00
1	31304.50	38.47	1.484	0.30(0.29)	0.96	9115.2	13830.00
1	32899.76	43.35	1.390	0.30(0.29)	0.96	10908.2	20700.00
1	35337.56	51.48	1.265	0.30(0.29)	0.97	14208.8	10100.00
1	37622.66	58.33	1.189	0.30(0.29)	0.97	17586.4	20300.00
1	40478.90	70.42	1.100	0.30(0.29)	0.96	24275.1	31400.00
1	42025.95	80.36	1.033	0.30(0.29)	0.96	29519.9	13100.00
1	42635.33	87.37	0.986	0.30(0.29)	0.96	32643.2	11801.00
1	43915.02	97.93	0.934	0.30(0.29)	0.96	38056.4	11530.00
1	44703.27	102.16	0.915	0.30(0.29)	0.96	40702.9	11701.00
1	46285.28	110.53	0.879	0.30(0.29)	0.97	46426.6	13500.00
1	47183.82	115.38	0.858	0.30(0.29)	0.97	49720.1	10800.00
1	47565.79	119.55	0.840	0.30(0.29)	0.97	52662.8	11130.00
1	46951.99	129.20	0.819	0.30(0.29)	0.97	57701.5	12410.00
1	46180.82	137.58	0.801	0.30(0.29)	0.97	61443.7	11201.00
1	45665.16	142.61	0.791	0.30(0.29)	0.97	63173.4	12201.00
1	44545.96	149.79	0.776	0.30(0.29)	0.97	65028.7	12231.00
1	43142.37	157.80	0.759	0.30(0.29)	0.97	66665.1	10400.00
1	41687.26	165.94	0.742	0.30(0.29)	0.97	67959.7	12010.00
1	40432.32	172.09	0.729	0.30(0.29)	0.97	68308.4	10210.00
1	35950.26	201.00	0.691	0.30(0.29)	0.98	69046.6	10100.00
2	163.86	15.46	2.568	0.30(0.28)	0.94	79.6	13889.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23819.67	15.46	2.568	0.30(0.29)	0.95	3500.7	13889.00
2	27634.24	26.39	1.842	0.30(0.29)	0.95	5918.8	13810.00
3	28021.33	27.62	1.794	0.30(0.29)	0.96	6245.4	13850.00
4	28982.97	30.71	1.685	0.30(0.29)	0.96	7049.4	13870.00
5	30908.27	37.07	1.520	0.30(0.29)	0.96	8656.9	10400.00
6	31390.65	38.47	1.484	0.30(0.29)	0.96	9194.8	13830.00
7	32979.19	43.35	1.390	0.30(0.29)	0.96	10987.8	20700.00
8	35408.08	51.48	1.265	0.30(0.29)	0.97	14288.4	10100.00
9	37687.68	58.33	1.189	0.30(0.29)	0.97	17666.0	20300.00
10	40537.55	70.42	1.100	0.30(0.29)	0.96	24354.7	31400.00
11	42079.81	80.36	1.033	0.30(0.29)	0.96	29599.6	13100.00
12	42685.80	87.37	0.986	0.30(0.29)	0.96	32722.8	11801.00
13	43961.77	97.93	0.934	0.30(0.29)	0.96	38136.0	11530.00
14	44748.70	102.16	0.915	0.30(0.29)	0.96	40782.5	11701.00
15	46328.11	110.53	0.879	0.30(0.29)	0.97	46506.2	13500.00
16	47225.14	115.38	0.858	0.30(0.29)	0.97	49799.7	10800.00
17	47605.82	119.55	0.840	0.30(0.29)	0.97	52742.4	11130.00
18	46990.50	129.20	0.819	0.30(0.29)	0.97	57781.2	12410.00
19	46218.08	137.58	0.801	0.30(0.29)	0.97	61523.3	11201.00
20	45701.68	142.61	0.791	0.30(0.29)	0.97	63253.0	12201.00
21	44581.41	149.79	0.776	0.30(0.29)	0.97	65108.4	12231.00
22	43176.61	157.80	0.759	0.30(0.29)	0.97	66744.8	10400.00
23	41720.29	165.94	0.742	0.30(0.29)	0.97	68039.3	12010.00
24	40464.44	172.09	0.729	0.30(0.29)	0.97	68388.0	10210.00
25	35979.60	201.00	0.691	0.30(0.29)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 47605.82 Tc(MIN.) = 119.55
EFFECTIVE AREA(ACRES) = 52742.41 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 69126.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 69126.2 TC(MIN.) = 119.55
EFFECTIVE AREA(ACRES) = 52742.41 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.971
PEAK FLOW RATE(CFS) = 47605.82

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23819.67	15.46	2.568	0.30(0.29)	0.95	3500.7	13889.00
2	27634.24	26.39	1.842	0.30(0.29)	0.95	5918.8	13810.00
3	28021.33	27.62	1.794	0.30(0.29)	0.96	6245.4	13850.00
4	28982.97	30.71	1.685	0.30(0.29)	0.96	7049.4	13870.00
5	30908.27	37.07	1.520	0.30(0.29)	0.96	8656.9	10400.00
6	31390.65	38.47	1.484	0.30(0.29)	0.96	9194.8	13830.00
7	32979.19	43.35	1.390	0.30(0.29)	0.96	10987.8	20700.00
8	35408.08	51.48	1.265	0.30(0.29)	0.97	14288.4	10100.00
9	37687.68	58.33	1.189	0.30(0.29)	0.97	17666.0	20300.00
10	40537.55	70.42	1.100	0.30(0.29)	0.96	24354.7	31400.00
11	42079.81	80.36	1.033	0.30(0.29)	0.96	29599.6	13100.00
12	42685.80	87.37	0.986	0.30(0.29)	0.96	32722.8	11801.00
13	43961.77	97.93	0.934	0.30(0.29)	0.96	38136.0	11530.00
14	44748.70	102.16	0.915	0.30(0.29)	0.96	40782.5	11701.00
15	46328.11	110.53	0.879	0.30(0.29)	0.97	46506.2	13500.00
16	47225.14	115.38	0.858	0.30(0.29)	0.97	49799.7	10800.00
17	47605.82	119.55	0.840	0.30(0.29)	0.97	52742.4	11130.00
18	46990.50	129.20	0.819	0.30(0.29)	0.97	57781.2	12410.00
19	46218.08	137.58	0.801	0.30(0.29)	0.97	61523.3	11201.00
20	45701.68	142.61	0.791	0.30(0.29)	0.97	63253.0	12201.00
21	44581.41	149.79	0.776	0.30(0.29)	0.97	65108.4	12231.00
22	43176.61	157.80	0.759	0.30(0.29)	0.97	66744.8	10400.00
23	41720.29	165.94	0.742	0.30(0.29)	0.97	68039.3	12010.00
24	40464.44	172.09	0.729	0.30(0.29)	0.97	68388.0	10210.00
25	35979.60	201.00	0.691	0.30(0.29)	0.98	69126.2	10100.00

==========

END OF RATIONAL METHOD ANALYSIS

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




 ------------------------------------------------------------------------
  FILE NAME: S39.DAT
  TIME/DATE OF STUDY: 10:47 09/12/2017
 ========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.220
   2)   10.00;  3.380
   3)   15.00;  2.606
   4)   20.00;  2.183
   5)   25.00;  1.894
   6)   30.00;  1.703
   7)   40.00;  1.444
   8)   50.00;  1.282
   9)   60.00;  1.169
  10)   90.00;  0.968
  11)  120.00;  0.837
  12)  180.00;  0.712
  13)  360.00;  0.522
  14) 1200.00;  0.227
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
 ************************************************************************
  FLOW PROCESS FROM NODE  13900.00 TO NODE  13901.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   600.65
  ELEVATION DATA: UPSTREAM(FEET) =    442.40  DOWNSTREAM(FEET) =    385.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.859
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  3.247
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  AGRICULTURAL POOR COVER
  "FALLOW"                  -        4.00      0.30     1.000     0   10.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.61
  TOTAL AREA(ACRES) =      4.00   PEAK FLOW RATE(CFS) =     10.61

 ************************************************************************
  FLOW PROCESS FROM NODE  13901.00 TO NODE  13902.00 IS CODE =  56
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    385.16  DOWNSTREAM(FEET) =    288.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   647.42   CHANNEL SLOPE =  0.1497
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.983
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        8.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.34
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   1.70
  Tc(MIN.) =   12.56
  SUBAREA AREA(ACRES) =     8.47       SUBAREA RUNOFF(CFS) =   20.46
  EFFECTIVE AREA(ACRES) =     12.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.5          PEAK FLOW RATE(CFS) =      30.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   7.24
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13902.00 =    1248.07 FEET.

 ************************************************************************
  FLOW PROCESS FROM NODE  13902.00 TO NODE  13903.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.21  DOWNSTREAM(FEET) =    184.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   669.27   CHANNEL SLOPE =  0.1544
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.57
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.795
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.85      0.30     0.982     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.982
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.15
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   1.22
  Tc(MIN.) =   13.78
  SUBAREA AREA(ACRES) =    23.85       SUBAREA RUNOFF(CFS) =   53.67
  EFFECTIVE AREA(ACRES) =     36.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       36.3         PEAK FLOW RATE(CFS) =      81.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =  10.38
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13903.00 =    1917.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   184.89  DOWNSTREAM(FEET) =   155.08
  FLOW LENGTH(FEET) =   876.66   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  22.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.86
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      81.67
  PIPE TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =   14.60
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13904.00 =    2794.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.60
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.668
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       21.29      0.30     0.996     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.996
  SUBAREA AREA(ACRES) =   21.29      SUBAREA RUNOFF(CFS) =   45.40
  EFFECTIVE AREA(ACRES) =     57.61   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =       57.6       PEAK FLOW RATE(CFS) =     122.93

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.08  DOWNSTREAM(FEET) =   118.00
  FLOW LENGTH(FEET) =  1961.38   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.50
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     122.93
  PIPE TRAVEL TIME(MIN.) =   2.11    Tc(MIN.) =   16.71
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.71
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  2.462
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.53      0.30     0.649     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.649
  SUBAREA AREA(ACRES) =   43.53      SUBAREA RUNOFF(CFS) =   88.81
  EFFECTIVE AREA(ACRES) =    101.14   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =      101.1       PEAK FLOW RATE(CFS) =     201.03

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S38.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    23819.67   15.46  0.30( 0.29) 0.95    3500.7   13889.00
      2    28982.97   30.71  0.30( 0.29) 0.96    7049.4   13870.00
```

```
      3    31390.65   38.47  0.30( 0.29) 0.96    9194.8   13830.00
      4    32979.19   43.35  0.30( 0.29) 0.96   10987.8   20700.00
      5    35408.08   51.48  0.30( 0.29) 0.97   14288.4   10100.00
      6    37687.68   58.33  0.30( 0.29) 0.97   17666.0   20300.00
      7    40537.55   70.42  0.30( 0.29) 0.96   24354.7   31400.00
      8    42079.81   80.36  0.30( 0.29) 0.96   29599.6   13100.00
      9    42685.80   87.37  0.30( 0.29) 0.96   32722.8   11801.00
     10    44748.70  102.16  0.30( 0.29) 0.96   40782.5   11701.00
     11    46328.11  110.53  0.30( 0.29) 0.97   46506.2   13500.00
     12    47605.82  119.55  0.30( 0.29) 0.97   52742.4   11130.00
     13    46990.50  129.20  0.30( 0.29) 0.97   57781.2   12410.00
     14    46218.08  137.58  0.30( 0.29) 0.97   61523.3   11201.00
     15    45701.68  142.61  0.30( 0.29) 0.97   63253.0   12201.00
     16    44581.41  149.79  0.30( 0.29) 0.97   65108.4   12231.00
     17    43176.61  157.80  0.30( 0.29) 0.97   66744.8   10400.00
     18    41720.29  165.94  0.30( 0.29) 0.97   68039.3   12010.00
     19    40464.44  172.09  0.30( 0.29) 0.97   68388.0   10210.00
     20    35979.60  201.00  0.30( 0.29) 0.98   69126.2   10100.00
   TOTAL AREA(ACRES) =    69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae      HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    23819.67   15.46  0.30( 0.29) 0.95    3500.7   13889.00
      2    28982.97   30.71  0.30( 0.29) 0.96    7049.4   13870.00
      3    31390.65   38.47  0.30( 0.29) 0.96    9194.8   13830.00
      4    32979.19   43.35  0.30( 0.29) 0.96   10987.8   20700.00
      5    35408.08   51.48  0.30( 0.29) 0.97   14288.4   10100.00
      6    37687.68   58.33  0.30( 0.29) 0.97   17666.0   20300.00
      7    40537.55   70.42  0.30( 0.29) 0.96   24354.7   31400.00
      8    42079.81   80.36  0.30( 0.29) 0.96   29599.6   13100.00
      9    42685.80   87.37  0.30( 0.29) 0.96   32722.8   11801.00
     10    44748.70  102.16  0.30( 0.29) 0.96   40782.5   11701.00
     11    46328.11  110.53  0.30( 0.29) 0.97   46506.2   13500.00
     12    47605.82  119.55  0.30( 0.29) 0.97   52742.4   11130.00
     13    46990.50  129.20  0.30( 0.29) 0.97   57781.2   12410.00
     14    46218.08  137.58  0.30( 0.29) 0.97   61523.3   11201.00
     15    45701.68  142.61  0.30( 0.29) 0.97   63253.0   12201.00
     16    44581.41  149.79  0.30( 0.29) 0.97   65108.4   12231.00
     17    43176.61  157.80  0.30( 0.29) 0.97   66744.8   10400.00
     18    41720.29  165.94  0.30( 0.29) 0.97   68039.3   12010.00
     19    40464.44  172.09  0.30( 0.29) 0.97   68388.0   10210.00
     20    35979.60  201.00  0.30( 0.29) 0.98   69126.2   10100.00
   TOTAL AREA(ACRES) =     69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    119.70  DOWNSTREAM(FEET) =    118.00
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1376.26   CHANNEL SLOPE =  0.0012
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  23.09
  *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.833
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.09      0.30     0.535     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.535
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   47634.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.73
  AVERAGE FLOW DEPTH(FEET) =  23.09   TRAVEL TIME(MIN.) =   2.14
  Tc(MIN.) =  121.68
  SUBAREA AREA(ACRES) =    96.09       SUBAREA RUNOFF(CFS) =   58.20
  EFFECTIVE AREA(ACRES) =  52838.50     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69222.3         PEAK FLOW RATE(CFS) =   47605.82
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  23.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 23.08   FLOW VELOCITY(FEET/SEC.) =  10.72
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae      HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    23819.67   18.05    2.348  0.30( 0.28) 0.94    3596.8   13889.00
      2    28982.97   33.16    1.621  0.30( 0.29) 0.95    7145.5   13870.00
      3    31390.65   40.86    1.430  0.30( 0.29) 0.96    9290.9   13830.00
      4    32979.19   45.71    1.351  0.30( 0.29) 0.96   11083.9   20700.00
      5    35408.08   53.80    1.239  0.30( 0.29) 0.96   14384.5   10100.00
      6    37687.68   60.61    1.165  0.30( 0.29) 0.96   17762.1   20300.00
      7    40537.55   72.66    1.084  0.30( 0.29) 0.96   24450.8   31400.00
      8    42079.81   82.57    1.018  0.30( 0.29) 0.96   29695.6   13100.00
      9    42685.80   89.58    0.971  0.30( 0.29) 0.96   32818.9   11801.00
     10    44748.70  104.33    0.905  0.30( 0.29) 0.96   40878.6   11701.00
     11    46328.11  112.68    0.869  0.30( 0.29) 0.97   46602.3   13500.00
     12    47605.82  121.68    0.833  0.30( 0.29) 0.97   52838.5   11130.00
     13    46990.50  131.34    0.813  0.30( 0.29) 0.97   57877.2   12410.00
     14    46218.08  139.73    0.796  0.30( 0.29) 0.97   61619.4   11201.00
     15    45701.68  144.77    0.785  0.30( 0.29) 0.97   63349.1   12201.00
     16    44581.41  151.97    0.770  0.30( 0.29) 0.97   65204.5   12231.00
     17    43176.61  159.99    0.754  0.30( 0.29) 0.97   66840.9   10400.00
     18    41720.29  168.15    0.737  0.30( 0.29) 0.97   68135.4   12010.00
     19    40464.44  174.33    0.724  0.30( 0.29) 0.97   68484.1   10210.00
     20    35979.60  203.31    0.687  0.30( 0.29) 0.97   69222.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.
```

```
 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      201.03   16.71    2.462  0.30( 0.25) 0.84     101.1   13900.00
 LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    23462.29   16.71    2.462  0.30( 0.28) 0.94    3430.8   13900.00
     2    24010.38   18.05    2.348  0.30( 0.28) 0.94    3697.9   13889.00
     3    29107.50   33.16    1.621  0.30( 0.28) 0.95    7246.6   13870.00
     4    31497.78   40.86    1.430  0.30( 0.29) 0.96    9392.0   13830.00
     5    33079.17   45.71    1.351  0.30( 0.29) 0.96   11185.0   20700.00
     6    35497.83   53.80    1.239  0.30( 0.29) 0.96   14485.6   10100.00
     7    37770.68   60.61    1.165  0.30( 0.29) 0.96   17863.3   20300.00
     8    40613.21   72.66    1.084  0.30( 0.29) 0.96   24552.0   31400.00
     9    42149.41   82.57    1.018  0.30( 0.29) 0.96   29796.8   13100.00
    10    42751.14   89.58    0.971  0.30( 0.29) 0.96   32920.1   11801.00
    11    44808.07  104.33    0.905  0.30( 0.29) 0.96   40979.7   11701.00
    12    46384.17  112.68    0.869  0.30( 0.29) 0.97   46703.4   13500.00
    13    47658.65  121.68    0.833  0.30( 0.29) 0.97   52939.6   11130.00
    14    47041.50  131.34    0.813  0.30( 0.29) 0.97   57978.4   12410.00
    15    46267.49  139.73    0.796  0.30( 0.29) 0.97   61720.5   11201.00
    16    45750.13  144.77    0.785  0.30( 0.29) 0.97   63450.2   12201.00
    17    44628.49  151.97    0.770  0.30( 0.29) 0.97   65305.6   12231.00
    18    43222.18  159.99    0.754  0.30( 0.29) 0.97   66942.0   10400.00
    19    41764.31  168.15    0.737  0.30( 0.29) 0.97   68236.5   12010.00
    20    40507.29  174.33    0.724  0.30( 0.29) 0.97   68585.2   10210.00
    21    36019.13  203.31    0.687  0.30( 0.29) 0.97   69323.4   10100.00
   TOTAL AREA(ACRES) =     69323.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    47658.65  Tc(MIN.) =  121.685
 EFFECTIVE AREA(ACRES) =  52939.64  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    69323.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13920.00 TO NODE  13921.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    118.00  DOWNSTREAM(FEET) =    115.28
 CHANNEL LENGTH THRU SUBAREA(FEET) =   335.44   CHANNEL SLOPE =  0.0081
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  14.33
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.833
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      134.30      0.30     0.658     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.658
```



```
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   47697.06
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.16
 AVERAGE FLOW DEPTH(FEET) =  14.33   TRAVEL TIME(MIN.) =   0.26
 Tc(MIN.) =  121.95
 SUBAREA AREA(ACRES) =   134.30       SUBAREA RUNOFF(CFS) =   76.82
 EFFECTIVE AREA(ACRES) =  53073.94     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =    69457.7         PEAK FLOW RATE(CFS) =   47658.65
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  14.32

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 14.32   FLOW VELOCITY(FEET/SEC.) =  21.15
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13921.00 =  136971.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13921.00 TO NODE  14010.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    115.28  DOWNSTREAM(FEET) =    100.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1396.08   CHANNEL SLOPE =  0.0109
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  13.24
 *  50 YEAR RAINFALL INTENSITY(INCH/HR) =  0.831
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       96.27      0.30     0.723     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.723
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   47685.25
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  23.54
 AVERAGE FLOW DEPTH(FEET) =  13.24   TRAVEL TIME(MIN.) =   0.99
 Tc(MIN.) =  122.94
 SUBAREA AREA(ACRES) =    96.27       SUBAREA RUNOFF(CFS) =   53.20
 EFFECTIVE AREA(ACRES) =  53170.21     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =    69554.0         PEAK FLOW RATE(CFS) =   47658.65
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  13.24

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 13.24   FLOW VELOCITY(FEET/SEC.) =  23.53
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  14010.00 =  138367.47 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    69554.0  TC(MIN.) =    122.94
 EFFECTIVE AREA(ACRES) =  53170.21  AREA-AVERAGED Fm(INCH/HR)=  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.969
 PEAK FLOW RATE(CFS)   =   47658.65
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23462.29	18.25	2.331	0.30(0.28)	0.92	3661.3	13900.00
2	24010.38	19.58	2.218	0.30(0.28)	0.93	3928.5	13889.00
3	29107.50	34.61	1.584	0.30(0.28)	0.94	7477.2	13870.00
4	31497.78	42.28	1.407	0.30(0.28)	0.95	9622.6	13830.00
5	33079.17	47.11	1.329	0.30(0.29)	0.95	11415.6	20700.00
6	35497.83	55.17	1.224	0.30(0.29)	0.96	14716.2	10100.00
7	37770.68	61.95	1.156	0.30(0.29)	0.96	18093.8	20300.00
8	40613.21	73.97	1.075	0.30(0.29)	0.96	24782.5	31400.00
9	42149.41	83.87	1.009	0.30(0.29)	0.96	30027.4	13100.00
10	42751.14	90.87	0.964	0.30(0.29)	0.96	33150.6	11801.00
11	44808.07	105.61	0.900	0.30(0.29)	0.96	41210.3	11701.00
12	46384.17	113.95	0.863	0.30(0.29)	0.96	46934.0	13500.00
13	47658.65	122.94	0.831	0.30(0.29)	0.97	53170.2	11130.00
14	47041.50	132.60	0.811	0.30(0.29)	0.97	58209.0	12410.00
15	46267.49	141.00	0.793	0.30(0.29)	0.97	61951.1	11201.00
16	45750.13	146.03	0.783	0.30(0.29)	0.97	63680.8	12201.00
17	44628.49	153.25	0.768	0.30(0.29)	0.97	65536.2	12231.00
18	43222.18	161.28	0.751	0.30(0.29)	0.97	67172.6	10400.00
19	41764.31	169.45	0.734	0.30(0.29)	0.97	68467.1	12010.00
20	40507.29	175.64	0.721	0.30(0.29)	0.97	68815.8	10210.00
21	36019.13	204.67	0.686	0.30(0.29)	0.97	69554.0	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S1.DAT
  TIME/DATE OF STUDY: 09:56 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  7.441
   2)   10.00;  4.561
   3)   15.00;  3.432
   4)   20.00;  2.736
   5)   25.00;  2.323
   6)   30.00;  2.065
   7)   40.00;  1.806
   8)   50.00;  1.530
   9)   60.00;  1.495
  10)   90.00;  1.304
  11)  120.00;  1.173
  12)  180.00;  1.010
  13)  360.00;  0.787
  14) 1440.00;  0.357
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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**************************************************************************
  FLOW PROCESS FROM NODE  10100.00 TO NODE  10101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   934.06
  ELEVATION DATA: UPSTREAM(FEET) =   3351.52  DOWNSTREAM(FEET) =   3172.56

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.411
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        3.55      0.30     1.000     0   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.94
  TOTAL AREA(ACRES) =      3.55   PEAK FLOW RATE(CFS) =      9.94

**************************************************************************
  FLOW PROCESS FROM NODE  10101.00 TO NODE  10102.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3172.56  DOWNSTREAM(FEET) =   3090.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   942.40   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.960
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       19.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.85
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   3.24
  Tc(MIN.) =   18.39
  SUBAREA AREA(ACRES) =    19.22       SUBAREA RUNOFF(CFS) =   46.02
  EFFECTIVE AREA(ACRES) =     22.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.8          PEAK FLOW RATE(CFS) =      54.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.82   FLOW VELOCITY(FEET/SEC.) =   5.72
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10102.00 =    1876.46 FEET.

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  FLOW PROCESS FROM NODE  10102.00 TO NODE  10103.00 IS CODE =  56
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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3090.55  DOWNSTREAM(FEET) =   3022.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   920.65   CHANNEL SLOPE =  0.0740
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.662
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      77.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.11
  AVERAGE FLOW DEPTH(FEET) =   1.05   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   20.90
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   45.74
  EFFECTIVE AREA(ACRES) =     44.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       44.3         PEAK FLOW RATE(CFS) =      94.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =   6.51
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10103.00 =    2797.11 FEET.

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  FLOW PROCESS FROM NODE  10103.00 TO NODE  10104.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3022.44  DOWNSTREAM(FEET) =   2962.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.87   CHANNEL SLOPE =  0.0612
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.492
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      126.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     219.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.93
  AVERAGE FLOW DEPTH(FEET) =   1.98   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =   22.96
  SUBAREA AREA(ACRES) =   126.78       SUBAREA RUNOFF(CFS) =  250.09
  EFFECTIVE AREA(ACRES) =    171.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.1         PEAK FLOW RATE(CFS) =     337.46
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.51   FLOW VELOCITY(FEET/SEC.) =   8.97
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10104.00 =    3774.98 FEET.

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  FLOW PROCESS FROM NODE  10104.00 TO NODE  10105.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.57  DOWNSTREAM(FEET) =   2917.85
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.94   CHANNEL SLOPE =  0.0240
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.195
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.68      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     433.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.87
  AVERAGE FLOW DEPTH(FEET) =   3.65   TRAVEL TIME(MIN.) =   4.53
  Tc(MIN.) =   27.48
  SUBAREA AREA(ACRES) =   112.68       SUBAREA RUNOFF(CFS) =  192.17
  EFFECTIVE AREA(ACRES) =    283.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      283.8         PEAK FLOW RATE(CFS) =     483.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.86   FLOW VELOCITY(FEET/SEC.) =   7.08
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.00 =    5639.92 FEET.

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  FLOW PROCESS FROM NODE  10105.00 TO NODE  10105.50 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2917.85  DOWNSTREAM(FEET) =   2880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1406.97   CHANNEL SLOPE =  0.0269
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.054
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      183.39      0.30     1.000     -
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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     628.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.92
  AVERAGE FLOW DEPTH(FEET) =   4.28   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   30.44
  SUBAREA AREA(ACRES) =   183.39       SUBAREA RUNOFF(CFS) =  289.44
  EFFECTIVE AREA(ACRES) =    467.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      467.1          PEAK FLOW RATE(CFS) =     737.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.63   FLOW VELOCITY(FEET/SEC.) =   8.27
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.50 =    7046.89 FEET.

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  FLOW PROCESS FROM NODE  10105.50 TO NODE  10106.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2880.00  DOWNSTREAM(FEET) =   2868.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1701.11   CHANNEL SLOPE =  0.0070
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.910
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     781.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.11
  AVERAGE FLOW DEPTH(FEET) =   6.59   TRAVEL TIME(MIN.) =   5.55
  Tc(MIN.) =   35.99
  SUBAREA AREA(ACRES) =    60.63       SUBAREA RUNOFF(CFS) =   87.85
  EFFECTIVE AREA(ACRES) =    527.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      527.8          PEAK FLOW RATE(CFS) =     764.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.53   FLOW VELOCITY(FEET/SEC.) =   5.08
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10106.00 =    8748.00 FEET.

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  FLOW PROCESS FROM NODE  10106.00 TO NODE  10107.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
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  ELEVATION DATA: UPSTREAM(FEET) =   2868.10  DOWNSTREAM(FEET) =   2781.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2951.00   CHANNEL SLOPE =  0.0294
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.763
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     845.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.86
  AVERAGE FLOW DEPTH(FEET) =   4.85   TRAVEL TIME(MIN.) =   5.55
  Tc(MIN.) =   41.54
  SUBAREA AREA(ACRES) =   123.11       SUBAREA RUNOFF(CFS) =  162.15
  EFFECTIVE AREA(ACRES) =    650.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.9          PEAK FLOW RATE(CFS) =     857.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.88   FLOW VELOCITY(FEET/SEC.) =   8.90
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10107.00 =   11699.00 FEET.

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  FLOW PROCESS FROM NODE  10107.00 TO NODE  10108.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2781.28  DOWNSTREAM(FEET) =   2725.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2630.56   CHANNEL SLOPE =  0.0213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.615
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      186.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     967.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.16
  AVERAGE FLOW DEPTH(FEET) =   5.60   TRAVEL TIME(MIN.) =   5.37
  Tc(MIN.) =   46.92
  SUBAREA AREA(ACRES) =   186.62       SUBAREA RUNOFF(CFS) =  220.88
  EFFECTIVE AREA(ACRES) =    837.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      837.5          PEAK FLOW RATE(CFS) =     991.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.66
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.66   FLOW VELOCITY(FEET/SEC.) =   8.21
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10108.00 =   14329.56 FEET.

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  FLOW PROCESS FROM NODE  10108.00 TO NODE  10109.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2725.20  DOWNSTREAM(FEET) =   2581.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2890.52   CHANNEL SLOPE =  0.0496
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.76
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.526
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1053.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.38
  AVERAGE FLOW DEPTH(FEET) =   4.75   TRAVEL TIME(MIN.) =   4.24
  Tc(MIN.) =   51.15
  SUBAREA AREA(ACRES) =   112.07       SUBAREA RUNOFF(CFS) =  123.66
  EFFECTIVE AREA(ACRES) =    949.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      949.6         PEAK FLOW RATE(CFS) =    1047.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.73   FLOW VELOCITY(FEET/SEC.) =  11.37
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10109.00 =   17220.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10109.00 TO NODE  10110.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.72  DOWNSTREAM(FEET) =   2367.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2877.15   CHANNEL SLOPE =  0.0744
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.44
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.513
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1127.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.46
```



```
  AVERAGE FLOW DEPTH(FEET) =   4.44   TRAVEL TIME(MIN.) =   3.56
  Tc(MIN.) =   54.72
  SUBAREA AREA(ACRES) =   145.21       SUBAREA RUNOFF(CFS) =  158.60
  EFFECTIVE AREA(ACRES) =   1094.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1094.8         PEAK FLOW RATE(CFS) =    1195.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.57   FLOW VELOCITY(FEET/SEC.) =  13.66
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10110.00 =   20097.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10110.00 TO NODE  10111.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2367.59  DOWNSTREAM(FEET) =   2075.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2802.04   CHANNEL SLOPE =  0.1041
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.503
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1379.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.06
  AVERAGE FLOW DEPTH(FEET) =   4.51   TRAVEL TIME(MIN.) =   2.91
  Tc(MIN.) =   57.63
  SUBAREA AREA(ACRES) =   339.01       SUBAREA RUNOFF(CFS) =  367.16
  EFFECTIVE AREA(ACRES) =   1433.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1433.8         PEAK FLOW RATE(CFS) =    1552.86
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.79   FLOW VELOCITY(FEET/SEC.) =  16.57
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10111.00 =   22899.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10111.00 TO NODE  10112.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2075.82  DOWNSTREAM(FEET) =   2004.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3782.59   CHANNEL SLOPE =  0.0190
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.466
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      265.32      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1692.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.03
  AVERAGE FLOW DEPTH(FEET) =   7.50   TRAVEL TIME(MIN.) =   6.98
  Tc(MIN.) =   64.61
  SUBAREA AREA(ACRES) =   265.32       SUBAREA RUNOFF(CFS) =  278.36
  EFFECTIVE AREA(ACRES) =   1699.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1699.1         PEAK FLOW RATE(CFS) =    1782.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.68   FLOW VELOCITY(FEET/SEC.) =   9.15
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.00 =   26681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10112.00 TO NODE  10112.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.03  DOWNSTREAM(FEET) =   1982.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1479.53   CHANNEL SLOPE =  0.0149
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.46
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.447
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      307.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1941.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.54
  AVERAGE FLOW DEPTH(FEET) =   8.45   TRAVEL TIME(MIN.) =   2.89
  Tc(MIN.) =   67.49
  SUBAREA AREA(ACRES) =   307.63       SUBAREA RUNOFF(CFS) =  317.67
  EFFECTIVE AREA(ACRES) =   2006.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.7         PEAK FLOW RATE(CFS) =    2072.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.71   FLOW VELOCITY(FEET/SEC.) =   8.68
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10112.50 =   28161.39 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1982.04  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3416.13   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.407
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2135.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.09
  AVERAGE FLOW DEPTH(FEET) =   8.62   TRAVEL TIME(MIN.) =   6.26
  Tc(MIN.) =   73.76
  SUBAREA AREA(ACRES) =   127.40       SUBAREA RUNOFF(CFS) =  126.98
  EFFECTIVE AREA(ACRES) =   2134.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2134.1         PEAK FLOW RATE(CFS) =    2127.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.61   FLOW VELOCITY(FEET/SEC.) =   9.08
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     2134.1  TC(MIN.) =     73.76
  EFFECTIVE AREA(ACRES) =   2134.14  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    2127.15
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S2.DAT
  TIME/DATE OF STUDY: 09:56 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  7.467
   2)   10.00;  4.574
   3)   15.00;  3.440
   4)   20.00;  2.741
   5)   25.00;  2.327
   6)   30.00;  2.069
   7)   40.00;  1.809
   8)   50.00;  1.532
   9)   60.00;  1.498
  10)   90.00;  1.307
  11)  120.00;  1.177
  12)  180.00;  1.014
  13)  360.00;  0.790
  14) 1440.00;  0.359
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10200.00 TO NODE  10201.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   301.66
  ELEVATION DATA: UPSTREAM(FEET) =   3087.44  DOWNSTREAM(FEET) =   3031.53

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.744
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.09      0.30     1.000     0    9.71
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.36
  TOTAL AREA(ACRES) =      1.09   PEAK FLOW RATE(CFS) =      4.36

**************************************************************************
  FLOW PROCESS FROM NODE  10201.00 TO NODE  10202.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3031.53  DOWNSTREAM(FEET) =   2903.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   538.03   CHANNEL SLOPE =  0.2382
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.193
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.54
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   1.97
  Tc(MIN.) =   11.68
  SUBAREA AREA(ACRES) =     4.06       SUBAREA RUNOFF(CFS) =   14.23
  EFFECTIVE AREA(ACRES) =      5.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2          PEAK FLOW RATE(CFS) =      18.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   5.34
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10202.00 =     839.69 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10202.00 TO NODE  10203.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.38  DOWNSTREAM(FEET) =   2639.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1124.98   CHANNEL SLOPE =  0.2344
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.77
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.711
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      73.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.82
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =   13.80
  SUBAREA AREA(ACRES) =    36.13       SUBAREA RUNOFF(CFS) =  110.93
  EFFECTIVE AREA(ACRES) =     41.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.3         PEAK FLOW RATE(CFS) =     126.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =  10.60
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10203.00 =    1964.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10203.00 TO NODE  10204.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2639.65  DOWNSTREAM(FEET) =   2444.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.75   CHANNEL SLOPE =  0.1026
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.69
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.126
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     198.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.19
  AVERAGE FLOW DEPTH(FEET) =   1.63   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   17.24
  SUBAREA AREA(ACRES) =    56.14       SUBAREA RUNOFF(CFS) =  142.81
  EFFECTIVE AREA(ACRES) =     97.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =     247.81
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.84   FLOW VELOCITY(FEET/SEC.) =   9.83
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10204.00 =    3862.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10204.00 TO NODE  10205.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2444.90  DOWNSTREAM(FEET) =   2245.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1973.02   CHANNEL SLOPE =  0.1010
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.752
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      264.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     540.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.27
  AVERAGE FLOW DEPTH(FEET) =   2.82   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   19.92
  SUBAREA AREA(ACRES) =   264.47       SUBAREA RUNOFF(CFS) =  583.55
  EFFECTIVE AREA(ACRES) =    361.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      361.9         PEAK FLOW RATE(CFS) =     798.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.45   FLOW VELOCITY(FEET/SEC.) =  13.69
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10205.00 =    5835.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10205.00 TO NODE  10206.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2245.64  DOWNSTREAM(FEET) =   2157.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1870.92   CHANNEL SLOPE =  0.0469
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.515
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      255.55      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1053.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.14
  AVERAGE FLOW DEPTH(FEET) =   4.82   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   22.72
  SUBAREA AREA(ACRES) =   255.55       SUBAREA RUNOFF(CFS) =  509.56
  EFFECTIVE AREA(ACRES) =    617.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      617.4          PEAK FLOW RATE(CFS) =    1231.17
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.20   FLOW VELOCITY(FEET/SEC.) =  11.61
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.00 =    7706.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.00 TO NODE  10206.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2157.91  DOWNSTREAM(FEET) =   2119.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1453.59   CHANNEL SLOPE =  0.0266
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.315
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1359.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.66
  AVERAGE FLOW DEPTH(FEET) =   6.25   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   25.23
  SUBAREA AREA(ACRES) =   141.47       SUBAREA RUNOFF(CFS) =  256.58
  EFFECTIVE AREA(ACRES) =    758.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      758.9          PEAK FLOW RATE(CFS) =    1376.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.29   FLOW VELOCITY(FEET/SEC.) =   9.69
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10206.50 =    9159.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   2119.30  DOWNSTREAM(FEET) =   2093.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2020.48   CHANNEL SLOPE =  0.0129
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.69
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.084
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1461.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.53
  AVERAGE FLOW DEPTH(FEET) =   7.66   TRAVEL TIME(MIN.) =   4.47
  Tc(MIN.) =   29.70
  SUBAREA AREA(ACRES) =   105.39       SUBAREA RUNOFF(CFS) =  169.25
  EFFECTIVE AREA(ACRES) =    864.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      864.3          PEAK FLOW RATE(CFS) =    1388.01
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.48   FLOW VELOCITY(FEET/SEC.) =   7.43
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  10220.00 =   11180.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10206.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.70
  RAINFALL INTENSITY(INCH/HR) =   2.08
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     864.30
  TOTAL STREAM AREA(ACRES) =     864.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1388.01

****************************************************************************
  FLOW PROCESS FROM NODE  10210.00 TO NODE  10211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   890.82
  ELEVATION DATA: UPSTREAM(FEET) =   2966.08  DOWNSTREAM(FEET) =   2867.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.601
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.216
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        7.25      0.30     1.000     0   16.60
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     19.03
  TOTAL AREA(ACRES) =      7.25   PEAK FLOW RATE(CFS) =     19.03

****************************************************************************
  FLOW PROCESS FROM NODE  10211.00 TO NODE  10212.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2867.74  DOWNSTREAM(FEET) =   2763.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1682.06   CHANNEL SLOPE =  0.0618
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.565
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       33.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.07
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   5.53
  Tc(MIN.) =   22.13
  SUBAREA AREA(ACRES) =    33.02       SUBAREA RUNOFF(CFS) =   67.31
  EFFECTIVE AREA(ACRES) =     40.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.3         PEAK FLOW RATE(CFS) =      82.09
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.14

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.14   FLOW VELOCITY(FEET/SEC.) =   5.85
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10212.00 =    2572.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10212.00 TO NODE  10213.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2763.75  DOWNSTREAM(FEET) =   2662.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1206.59   CHANNEL SLOPE =  0.0842
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.353
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       71.89      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     148.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.86
  AVERAGE FLOW DEPTH(FEET) =   1.46   TRAVEL TIME(MIN.) =   2.56
  Tc(MIN.) =   24.68
  SUBAREA AREA(ACRES) =    71.89       SUBAREA RUNOFF(CFS) =  132.85
  EFFECTIVE AREA(ACRES) =    112.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      112.2          PEAK FLOW RATE(CFS) =     207.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.76   FLOW VELOCITY(FEET/SEC.) =   8.71
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10213.00 =    3779.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10213.00 TO NODE  10214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2662.20  DOWNSTREAM(FEET) =   2520.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1783.17   CHANNEL SLOPE =  0.0793
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.48
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.191
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      182.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     362.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.05
  AVERAGE FLOW DEPTH(FEET) =   2.43   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   27.64
  SUBAREA AREA(ACRES) =   182.61       SUBAREA RUNOFF(CFS) =  310.76
  EFFECTIVE AREA(ACRES) =    294.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      294.8          PEAK FLOW RATE(CFS) =     501.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.89   FLOW VELOCITY(FEET/SEC.) =  11.02
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10214.00 =    5562.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10214.00 TO NODE  10215.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   2520.73  DOWNSTREAM(FEET) =   2270.71
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2774.20   CHANNEL SLOPE =  0.0901
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.032
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      156.94      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     624.02
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.26
 AVERAGE FLOW DEPTH(FEET) =   3.13   TRAVEL TIME(MIN.) =   3.77
 Tc(MIN.) =   31.41
 SUBAREA AREA(ACRES) =   156.94       SUBAREA RUNOFF(CFS) =  244.69
 EFFECTIVE AREA(ACRES) =    451.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      451.7          PEAK FLOW RATE(CFS) =     704.27
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.33

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.33   FLOW VELOCITY(FEET/SEC.) =  12.69
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10215.00 =    8336.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10215.00 TO NODE  10216.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2270.71  DOWNSTREAM(FEET) =   2151.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.75   CHANNEL SLOPE =  0.0592
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.97
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.955
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      130.62      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     801.54
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.28
 AVERAGE FLOW DEPTH(FEET) =   3.96   TRAVEL TIME(MIN.) =   2.98
 Tc(MIN.) =   34.40
 SUBAREA AREA(ACRES) =   130.62       SUBAREA RUNOFF(CFS) =  194.53
 EFFECTIVE AREA(ACRES) =    582.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      582.3          PEAK FLOW RATE(CFS) =     867.27
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.12
```



```
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.12   FLOW VELOCITY(FEET/SEC.) =  11.52
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.00 =   10356.59 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10216.00 TO NODE  10216.50 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2151.20  DOWNSTREAM(FEET) =   2120.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1242.42   CHANNEL SLOPE =  0.0246
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.24
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.891
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       51.25      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     903.96
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.45
 AVERAGE FLOW DEPTH(FEET) =   5.23   TRAVEL TIME(MIN.) =   2.45
 Tc(MIN.) =   36.85
 SUBAREA AREA(ACRES) =    51.25       SUBAREA RUNOFF(CFS) =   73.39
 EFFECTIVE AREA(ACRES) =    633.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      633.6          PEAK FLOW RATE(CFS) =     907.25
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.24

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.24   FLOW VELOCITY(FEET/SEC.) =   8.46
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10216.50 =   11599.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2120.63  DOWNSTREAM(FEET) =   2093.25
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1301.06   CHANNEL SLOPE =  0.0210
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.821
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       26.16      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     925.15
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.02
```

```
  AVERAGE FLOW DEPTH(FEET) =   5.50   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   39.55
  SUBAREA AREA(ACRES) =    26.16       SUBAREA RUNOFF(CFS) =   35.80
  EFFECTIVE AREA(ACRES) =    659.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      659.7         PEAK FLOW RATE(CFS) =     907.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.44   FLOW VELOCITY(FEET/SEC.) =   7.98
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10216.50 TO NODE  10220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   39.55
  RAINFALL INTENSITY(INCH/HR) =   1.82
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     659.74
  TOTAL STREAM AREA(ACRES) =     659.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     907.25

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1388.01   29.70    2.084  0.30( 0.30) 1.00     864.3   10200.00
      2      907.25   39.55    1.821  0.30( 0.30) 1.00     659.7   10210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2187.49   29.70    2.084  0.30( 0.30) 1.00    1359.8   10200.00
      2     2090.18   39.55    1.821  0.30( 0.30) 1.00    1524.0   10210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2187.49    Tc(MIN.) =    29.70
  EFFECTIVE AREA(ACRES) =    1359.77   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1524.0
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10220.00 =   12900.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10220.00 TO NODE  10221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2093.25  DOWNSTREAM(FEET) =   1965.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2966.11   CHANNEL SLOPE =  0.0430
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.11
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.979
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      104.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2266.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.19
  AVERAGE FLOW DEPTH(FEET) =   7.10   TRAVEL TIME(MIN.) =   3.75
  Tc(MIN.) =   33.45
  SUBAREA AREA(ACRES) =   104.45       SUBAREA RUNOFF(CFS) =  157.87
  EFFECTIVE AREA(ACRES) =   1464.22     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1628.5         PEAK FLOW RATE(CFS) =    2213.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.02   FLOW VELOCITY(FEET/SEC.) =  13.11
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.00 =   15866.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.00 TO NODE  10221.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1965.76  DOWNSTREAM(FEET) =   1950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1346.48   CHANNEL SLOPE =  0.0117
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.908
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      169.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2335.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.19
  AVERAGE FLOW DEPTH(FEET) =   9.70   TRAVEL TIME(MIN.) =   2.74
  Tc(MIN.) =   36.19
  SUBAREA AREA(ACRES) =   169.50       SUBAREA RUNOFF(CFS) =  245.32
  EFFECTIVE AREA(ACRES) =   1633.72     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1798.0         PEAK FLOW RATE(CFS) =    2364.47
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.75   FLOW VELOCITY(FEET/SEC.) =   8.22
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10221.50 =   17212.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1950.00  DOWNSTREAM(FEET) =   1925.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1849.80   CHANNEL SLOPE =  0.0131
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.57
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.815
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2393.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.58
  AVERAGE FLOW DEPTH(FEET) =   9.57   TRAVEL TIME(MIN.) =   3.59
  Tc(MIN.) =   39.78
  SUBAREA AREA(ACRES) =    43.12       SUBAREA RUNOFF(CFS) =   58.78
  EFFECTIVE AREA(ACRES) =   1676.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1841.1         PEAK FLOW RATE(CFS) =    2364.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.52   FLOW VELOCITY(FEET/SEC.) =   8.56
  LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1841.1  TC(MIN.) =     39.78
  EFFECTIVE AREA(ACRES) =   1676.84  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    2364.47

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2364.47   39.78    1.815  0.30( 0.30) 1.00    1676.8   10200.00
      2     2167.08   49.80    1.537  0.30( 0.30) 1.00    1841.1   10210.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S3.DAT
  TIME/DATE OF STUDY: 09:57 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  7.487
   2)   10.00;  4.584
   3)   15.00;  3.447
   4)   20.00;  2.745
   5)   25.00;  2.329
   6)   30.00;  2.071
   7)   40.00;  1.811
   8)   50.00;  1.534
   9)   60.00;  1.500
  10)   90.00;  1.310
  11)  120.00;  1.180
  12)  180.00;  1.017
  13)  360.00;  0.792
  14) 1440.00;  0.360
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10300.00 TO NODE  10301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.52
  ELEVATION DATA: UPSTREAM(FEET) =   4227.21  DOWNSTREAM(FEET) =   4064.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.977
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.758
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.00      0.30     1.000     0    7.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.91
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      4.91

**************************************************************************
  FLOW PROCESS FROM NODE  10301.00 TO NODE  10302.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4064.64  DOWNSTREAM(FEET) =   3797.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =   631.34   CHANNEL SLOPE =  0.4235
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.796
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.23      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.35
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.66
  Tc(MIN.) =    9.63
  SUBAREA AREA(ACRES) =     6.23       SUBAREA RUNOFF(CFS) =   25.21
  EFFECTIVE AREA(ACRES) =      7.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2          PEAK FLOW RATE(CFS) =      29.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   7.68
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10302.00 =     941.86 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10302.00 TO NODE  10303.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3797.25  DOWNSTREAM(FEET) =   3447.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1908.89   CHANNEL SLOPE =  0.1834
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.805
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.40
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   3.79
  Tc(MIN.) =   13.42
  SUBAREA AREA(ACRES) =    32.83       SUBAREA RUNOFF(CFS) =  103.58
  EFFECTIVE AREA(ACRES) =     40.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =     126.39
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.07   FLOW VELOCITY(FEET/SEC.) =   9.72
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10303.00 =    2850.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10303.00 TO NODE  10304.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3447.07  DOWNSTREAM(FEET) =   3228.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.05   CHANNEL SLOPE =  0.1140
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.68
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.203
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     205.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.65
  AVERAGE FLOW DEPTH(FEET) =   1.61   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   16.74
  SUBAREA AREA(ACRES) =    60.51       SUBAREA RUNOFF(CFS) =  158.10
  EFFECTIVE AREA(ACRES) =    100.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.6         PEAK FLOW RATE(CFS) =     262.77
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.85   FLOW VELOCITY(FEET/SEC.) =  10.37
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10304.00 =    4768.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10304.00 TO NODE  10305.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3228.48  DOWNSTREAM(FEET) =   3118.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1679.40   CHANNEL SLOPE =  0.0656
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.794
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     393.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.60
  AVERAGE FLOW DEPTH(FEET) =   2.67   TRAVEL TIME(MIN.) =   2.91
  Tc(MIN.) =   19.65
  SUBAREA AREA(ACRES) =   116.56       SUBAREA RUNOFF(CFS) =  261.62
  EFFECTIVE AREA(ACRES) =    217.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      217.1         PEAK FLOW RATE(CFS) =     487.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.99   FLOW VELOCITY(FEET/SEC.) =  10.21
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10305.00 =    6448.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10305.00 TO NODE  10306.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3118.37  DOWNSTREAM(FEET) =   2807.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2853.67   CHANNEL SLOPE =  0.1088
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.479
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      189.23      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     673.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.40
  AVERAGE FLOW DEPTH(FEET) =   3.10   TRAVEL TIME(MIN.) =   3.55
  Tc(MIN.) =   23.20
  SUBAREA AREA(ACRES) =   189.23       SUBAREA RUNOFF(CFS) =  371.05
  EFFECTIVE AREA(ACRES) =    406.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      406.4          PEAK FLOW RATE(CFS) =     796.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.38   FLOW VELOCITY(FEET/SEC.) =  14.05
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10306.00 =    9301.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10306.00 TO NODE  10307.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2807.99  DOWNSTREAM(FEET) =   2591.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2848.03   CHANNEL SLOPE =  0.0759
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.57
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.242
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      416.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1161.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.66
  AVERAGE FLOW DEPTH(FEET) =   4.48   TRAVEL TIME(MIN.) =   3.48
  Tc(MIN.) =   26.68
  SUBAREA AREA(ACRES) =   416.51       SUBAREA RUNOFF(CFS) =  728.18
  EFFECTIVE AREA(ACRES) =    822.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      822.9          PEAK FLOW RATE(CFS) =    1438.61
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.98   FLOW VELOCITY(FEET/SEC.) =  14.45
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10307.00 =   12149.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10307.00 TO NODE  10308.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   2591.87  DOWNSTREAM(FEET) =   2516.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.06   CHANNEL SLOPE =  0.0263
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.036
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.49      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1689.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.18
  AVERAGE FLOW DEPTH(FEET) =   6.95   TRAVEL TIME(MIN.) =   4.68
  Tc(MIN.) =   31.36
  SUBAREA AREA(ACRES) =   320.49       SUBAREA RUNOFF(CFS) =  501.85
  EFFECTIVE AREA(ACRES) =   1143.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1143.4          PEAK FLOW RATE(CFS) =    1787.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.13   FLOW VELOCITY(FEET/SEC.) =  10.34
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.00 =   15011.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.00 TO NODE  10308.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2516.62  DOWNSTREAM(FEET) =   2462.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.32   CHANNEL SLOPE =  0.0288
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.961
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.88      0.30     0.966     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.966
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1931.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.90
  AVERAGE FLOW DEPTH(FEET) =   7.24   TRAVEL TIME(MIN.) =   2.89
  Tc(MIN.) =   34.25
  SUBAREA AREA(ACRES) =   191.88       SUBAREA RUNOFF(CFS) =  288.53
  EFFECTIVE AREA(ACRES) =   1335.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1335.2          PEAK FLOW RATE(CFS) =    1998.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.35
```

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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.35   FLOW VELOCITY(FEET/SEC.) =  11.00
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10308.50 =   16901.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10308.50 TO NODE  10309.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.25  DOWNSTREAM(FEET) =   2409.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1874.33   CHANNEL SLOPE =  0.0279
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.887
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2062.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.97
  AVERAGE FLOW DEPTH(FEET) =   7.51   TRAVEL TIME(MIN.) =   2.85
  Tc(MIN.) =   37.10
  SUBAREA AREA(ACRES) =    90.14       SUBAREA RUNOFF(CFS) =  128.71
  EFFECTIVE AREA(ACRES) =   1425.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1425.4         PEAK FLOW RATE(CFS) =    2038.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.47   FLOW VELOCITY(FEET/SEC.) =  10.94
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10309.00 =   18775.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2409.87  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2576.20   CHANNEL SLOPE =  0.0310
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.787
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.83      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2094.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.44
```



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  AVERAGE FLOW DEPTH(FEET) =   7.39   TRAVEL TIME(MIN.) =   3.75
  Tc(MIN.) =   40.85
  SUBAREA AREA(ACRES) =    83.83       SUBAREA RUNOFF(CFS) =  112.23
  EFFECTIVE AREA(ACRES) =   1509.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1509.2         PEAK FLOW RATE(CFS) =    2038.29
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.30   FLOW VELOCITY(FEET/SEC.) =  11.36
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10309.00 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   40.85
  RAINFALL INTENSITY(INCH/HR) =   1.79
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =    1509.21
  TOTAL STREAM AREA(ACRES) =    1509.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2038.29

****************************************************************************
  FLOW PROCESS FROM NODE  10320.00 TO NODE  10321.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.56
  ELEVATION DATA: UPSTREAM(FEET) =   3374.80  DOWNSTREAM(FEET) =   3300.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.959
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.189
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.24      0.30     1.000     0    8.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.86
  TOTAL AREA(ACRES) =      2.24   PEAK FLOW RATE(CFS) =      9.86

****************************************************************************
  FLOW PROCESS FROM NODE  10321.00 TO NODE  10322.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3300.24  DOWNSTREAM(FEET) =   3187.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   581.07   CHANNEL SLOPE =  0.1945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.392
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.13
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   1.89
  Tc(MIN.) =   10.85
  SUBAREA AREA(ACRES) =     5.01       SUBAREA RUNOFF(CFS) =   18.45
  EFFECTIVE AREA(ACRES) =      7.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.2         PEAK FLOW RATE(CFS) =      26.70
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   5.80
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10322.00 =     871.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10322.00 TO NODE  10323.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3187.21  DOWNSTREAM(FEET) =   3108.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.98   CHANNEL SLOPE =  0.0801
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.793
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.20
  AVERAGE FLOW DEPTH(FEET) =   1.00   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =   13.48
  SUBAREA AREA(ACRES) =    30.37       SUBAREA RUNOFF(CFS) =   95.49
  EFFECTIVE AREA(ACRES) =     37.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =     118.28
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.30
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =   7.21
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10323.00 =    1849.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10323.00 TO NODE  10324.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3108.86  DOWNSTREAM(FEET) =   2923.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.11   CHANNEL SLOPE =  0.0966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.168
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     207.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.14
  AVERAGE FLOW DEPTH(FEET) =   1.70   TRAVEL TIME(MIN.) =   3.51
  Tc(MIN.) =   16.99
  SUBAREA AREA(ACRES) =    68.88       SUBAREA RUNOFF(CFS) =  177.80
  EFFECTIVE AREA(ACRES) =    106.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.5         PEAK FLOW RATE(CFS) =     274.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.98   FLOW VELOCITY(FEET/SEC.) =   9.94
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10324.00 =    3773.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10324.00 TO NODE  10325.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2923.03  DOWNSTREAM(FEET) =   2675.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2788.58   CHANNEL SLOPE =  0.0889
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.68
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.643
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      146.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     429.62
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.98
  AVERAGE FLOW DEPTH(FEET) =   2.58   TRAVEL TIME(MIN.) =   4.23
  Tc(MIN.) =   21.22
  SUBAREA AREA(ACRES) =   146.19       SUBAREA RUNOFF(CFS) =  308.32
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =     532.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.89   FLOW VELOCITY(FEET/SEC.) =  11.69
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10325.00 =    6562.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10325.00 TO NODE  10326.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2675.11  DOWNSTREAM(FEET) =   2541.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.28   CHANNEL SLOPE =  0.0465
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.39
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.287
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      321.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     821.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.40
  AVERAGE FLOW DEPTH(FEET) =   4.26   TRAVEL TIME(MIN.) =   4.59
  Tc(MIN.) =   25.81
  SUBAREA AREA(ACRES) =   321.78       SUBAREA RUNOFF(CFS) =  575.55
  EFFECTIVE AREA(ACRES) =    574.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      574.5         PEAK FLOW RATE(CFS) =    1027.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.76   FLOW VELOCITY(FEET/SEC.) =  11.05
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.00 =    9424.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10326.00 TO NODE  10326.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2541.92  DOWNSTREAM(FEET) =   2438.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2617.40   CHANNEL SLOPE =  0.0394
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.34
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.078
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      187.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1177.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.77
  AVERAGE FLOW DEPTH(FEET) =   5.31   TRAVEL TIME(MIN.) =   4.05
  Tc(MIN.) =   29.86
  SUBAREA AREA(ACRES) =   187.06       SUBAREA RUNOFF(CFS) =  299.39
  EFFECTIVE AREA(ACRES) =    761.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      761.5         PEAK FLOW RATE(CFS) =    1218.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.40   FLOW VELOCITY(FEET/SEC.) =  10.86
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10326.50 =   12041.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10326.50 TO NODE  10327.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2438.80  DOWNSTREAM(FEET) =   2414.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1181.79   CHANNEL SLOPE =  0.0204
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.015
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1282.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.65
  AVERAGE FLOW DEPTH(FEET) =   6.47   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =   32.14
  SUBAREA AREA(ACRES) =    82.27       SUBAREA RUNOFF(CFS) =  127.02
  EFFECTIVE AREA(ACRES) =    843.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      843.8         PEAK FLOW RATE(CFS) =    1302.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.52   FLOW VELOCITY(FEET/SEC.) =   8.68
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.00 =   13223.77 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  10327.00 TO NODE  10327.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2414.64  DOWNSTREAM(FEET) =   2389.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2431.92   CHANNEL SLOPE =  0.0102
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.15
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.863
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      243.69      0.30     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1474.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.93
  AVERAGE FLOW DEPTH(FEET) =   8.11   TRAVEL TIME(MIN.) =   5.85
  Tc(MIN.) =   37.99
  SUBAREA AREA(ACRES) =   243.69       SUBAREA RUNOFF(CFS) =  343.09
  EFFECTIVE AREA(ACRES) =   1087.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1087.5         PEAK FLOW RATE(CFS) =    1530.37
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.25   FLOW VELOCITY(FEET/SEC.) =   7.00
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10327.50 =   15655.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2389.73  DOWNSTREAM(FEET) =   2330.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.59   CHANNEL SLOPE =  0.0306
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.782
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1576.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.59
  AVERAGE FLOW DEPTH(FEET) =   6.48   TRAVEL TIME(MIN.) =   3.06
  Tc(MIN.) =   41.05
  SUBAREA AREA(ACRES) =    69.36       SUBAREA RUNOFF(CFS) =   92.52
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  EFFECTIVE AREA(ACRES) =   1156.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1156.8         PEAK FLOW RATE(CFS) =    1543.28
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.42   FLOW VELOCITY(FEET/SEC.) =  10.53
  LONGEST FLOWPATH FROM NODE  10320.00 TO NODE  10330.00 =   17600.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10327.50 TO NODE  10330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.05
  RAINFALL INTENSITY(INCH/HR) =   1.78
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1156.85
  TOTAL STREAM AREA(ACRES) =    1156.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1543.28

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2038.29   40.85    1.787  0.30( 0.30) 0.99    1509.2   10300.00
      2     1543.28   41.05    1.782  0.30( 0.30) 1.00    1156.8   10320.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3579.83   40.85    1.787  0.30( 0.30) 1.00    2660.5   10300.00
      2     3574.13   41.05    1.782  0.30( 0.30) 1.00    2666.1   10320.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    3579.83    Tc(MIN.) =    40.85
  EFFECTIVE AREA(ACRES) =    2660.52   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2666.1
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10330.00 =   21351.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10330.00 TO NODE  10331.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2330.13  DOWNSTREAM(FEET) =   2041.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3034.53   CHANNEL SLOPE =  0.0951
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.35
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.717
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       70.23      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3624.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.99
  AVERAGE FLOW DEPTH(FEET) =   7.34   TRAVEL TIME(MIN.) =   2.53
  Tc(MIN.) =   43.38
  SUBAREA AREA(ACRES) =    70.23       SUBAREA RUNOFF(CFS) =   89.59
  EFFECTIVE AREA(ACRES) =   2730.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2736.3         PEAK FLOW RATE(CFS) =    3579.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.30   FLOW VELOCITY(FEET/SEC.) =  19.92
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10331.00 =   24386.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2041.66  DOWNSTREAM(FEET) =   1739.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3264.87   CHANNEL SLOPE =  0.0924
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.641
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      104.94      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3643.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.80
  AVERAGE FLOW DEPTH(FEET) =   7.41   TRAVEL TIME(MIN.) =   2.75
  Tc(MIN.) =   46.13
  SUBAREA AREA(ACRES) =   104.94       SUBAREA RUNOFF(CFS) =  126.68
  EFFECTIVE AREA(ACRES) =   2835.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2841.2         PEAK FLOW RATE(CFS) =    3579.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.35
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.35   FLOW VELOCITY(FEET/SEC.) =  19.71
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S1.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2127.15   73.76  0.30( 0.30) 1.00    2134.1   10100.00
    TOTAL AREA(ACRES) =     2134.1

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S2.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2364.47   39.78  0.30( 0.30) 1.00    1676.8   10200.00
      2     2167.08   49.80  0.30( 0.30) 1.00    1841.1   10210.00
    TOTAL AREA(ACRES) =     1841.1

****************************************************************************
  FLOW PROCESS FROM NODE  10221.50 TO NODE  10222.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2364.47   39.78  0.30( 0.30) 1.00    1676.8   10200.00
      2     2167.08   49.80  0.30( 0.30) 1.00    1841.1   10210.00
    TOTAL AREA(ACRES) =      1841.1

****************************************************************************
  FLOW PROCESS FROM NODE  10112.50 TO NODE  10222.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2364.47   39.78    1.817  0.30( 0.30) 1.00    1676.8   10200.00
```

```
    2     2167.08   49.80    1.539  0.30( 0.30) 1.00    1841.1   10210.00
 LONGEST FLOWPATH FROM NODE  10210.00 TO NODE  10222.00 =   19062.46 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     2127.15   73.76    1.413  0.30( 0.30) 1.00    2134.1   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3928.04   39.78    1.817  0.30( 0.30) 1.00    2827.9   10200.00
    2     3766.75   49.80    1.539  0.30( 0.30) 1.00    3282.1   10210.00
    3     4072.89   73.76    1.413  0.30( 0.30) 1.00    3975.2   10100.00
   TOTAL AREA(ACRES) =      3975.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     4072.89  Tc(MIN.) =   73.758
 EFFECTIVE AREA(ACRES) =   3975.25  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3975.2
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10222.00 =   31577.52 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10222.00 TO NODE  10332.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1925.82  DOWNSTREAM(FEET) =   1739.96
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1475.92   CHANNEL SLOPE =  0.1259
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.27
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.406
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       19.92      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4082.81
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  22.87
 AVERAGE FLOW DEPTH(FEET) =   7.27   TRAVEL TIME(MIN.) =   1.08
 Tc(MIN.) =   74.83
 SUBAREA AREA(ACRES) =    19.92       SUBAREA RUNOFF(CFS) =   19.83
 EFFECTIVE AREA(ACRES) =   3995.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3995.2          PEAK FLOW RATE(CFS) =    4072.89
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.27

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.27   FLOW VELOCITY(FEET/SEC.) =  22.85
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.
```



```
****************************************************************************
 FLOW PROCESS FROM NODE  10331.00 TO NODE  10332.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3928.04   40.87    1.787  0.30( 0.30) 1.00    2847.8   10200.00
    2     3766.75   50.90    1.531  0.30( 0.30) 1.00    3302.0   10210.00
    3     4072.89   74.83    1.406  0.30( 0.30) 1.00    3995.2   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3579.83   46.13    1.641  0.30( 0.30) 1.00    2835.7   10300.00
    2     3574.13   46.33    1.636  0.30( 0.30) 1.00    2841.2   10320.00
 LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  10332.00 =   27651.21 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     7443.85   40.87    1.787  0.30( 0.30) 1.00    5360.1   10200.00
    2     7423.28   46.13    1.641  0.30( 0.30) 1.00    5921.7   10300.00
    3     7414.38   46.33    1.636  0.30( 0.30) 1.00    5936.3   10320.00
    4     7060.82   50.90    1.531  0.30( 0.30) 1.00    6143.3   10210.00
    5     7033.11   74.83    1.406  0.30( 0.30) 1.00    6836.4   10100.00
   TOTAL AREA(ACRES) =      6836.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     7443.85  Tc(MIN.) =   40.868
 EFFECTIVE AREA(ACRES) =   5360.12  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     6836.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10332.00 =   33053.44 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     6836.4  TC(MIN.) =     40.87
 EFFECTIVE AREA(ACRES) =   5360.12  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.998
 PEAK FLOW RATE(CFS)   =    7443.85

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     7443.85   40.87    1.787  0.30( 0.30) 1.00    5360.1   10200.00
    2     7423.28   46.13    1.641  0.30( 0.30) 1.00    5921.7   10300.00
    3     7414.38   46.33    1.636  0.30( 0.30) 1.00    5936.3   10320.00
    4     7060.82   50.90    1.531  0.30( 0.30) 1.00    6143.3   10210.00
    5     7033.11   74.83    1.406  0.30( 0.30) 1.00    6836.4   10100.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S4.DAT
  TIME/DATE OF STUDY: 09:57 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  7.393
   2)   10.00;  4.538
   3)   15.00;  3.417
   4)   20.00;  2.726
   5)   25.00;  2.316
   6)   30.00;  2.059
   7)   40.00;  1.800
   8)   50.00;  1.526
   9)   60.00;  1.488
  10)   90.00;  1.297
  11)  120.00;  1.166
  12)  180.00;  1.004
  13)  360.00;  0.780
  14) 1440.00;  0.354
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10400.00 TO NODE  10401.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.42
  ELEVATION DATA: UPSTREAM(FEET) =   2648.70  DOWNSTREAM(FEET) =   2536.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.799
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.168
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.89      0.30     1.000     0   16.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     15.21
  TOTAL AREA(ACRES) =      5.89   PEAK FLOW RATE(CFS) =     15.21

**************************************************************************
  FLOW PROCESS FROM NODE  10401.00 TO NODE  10402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2536.15  DOWNSTREAM(FEET) =   2504.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   934.06   CHANNEL SLOPE =  0.0340
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.632
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.58
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   4.35
  Tc(MIN.) =   21.15
  SUBAREA AREA(ACRES) =    17.57       SUBAREA RUNOFF(CFS) =   36.87
  EFFECTIVE AREA(ACRES) =     23.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.5          PEAK FLOW RATE(CFS) =      49.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.01   FLOW VELOCITY(FEET/SEC.) =   4.06
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.00 =    1884.48 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10402.00 TO NODE  10402.50 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2504.36  DOWNSTREAM(FEET) =   2462.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.55   CHANNEL SLOPE =  0.0439
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.399
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     102.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.60
  AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   2.83
  Tc(MIN.) =   23.98
  SUBAREA AREA(ACRES) =    56.74       SUBAREA RUNOFF(CFS) =  107.22
  EFFECTIVE AREA(ACRES) =     80.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       80.2         PEAK FLOW RATE(CFS) =     151.55
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =   6.31
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10402.50 =    2836.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10402.50 TO NODE  10403.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2462.54  DOWNSTREAM(FEET) =   2433.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.41   CHANNEL SLOPE =  0.0299
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.39
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.232
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.01      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     210.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.08
  AVERAGE FLOW DEPTH(FEET) =   2.35   TRAVEL TIME(MIN.) =   2.65
  Tc(MIN.) =   26.63
  SUBAREA AREA(ACRES) =    68.01       SUBAREA RUNOFF(CFS) =  118.27
  EFFECTIVE AREA(ACRES) =    148.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      148.2         PEAK FLOW RATE(CFS) =     257.73
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.63   FLOW VELOCITY(FEET/SEC.) =   6.43
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10403.00 =    3803.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10403.00 TO NODE  10404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2433.59  DOWNSTREAM(FEET) =   2239.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2934.12   CHANNEL SLOPE =  0.0662
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.08
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.023
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      301.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     491.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.27
  AVERAGE FLOW DEPTH(FEET) =   2.99   TRAVEL TIME(MIN.) =   4.76
  Tc(MIN.) =   31.39
  SUBAREA AREA(ACRES) =   301.25       SUBAREA RUNOFF(CFS) =  467.14
  EFFECTIVE AREA(ACRES) =    449.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      449.5         PEAK FLOW RATE(CFS) =     696.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.59   FLOW VELOCITY(FEET/SEC.) =  11.31
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10404.00 =    6737.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10404.00 TO NODE  10405.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2239.33  DOWNSTREAM(FEET) =   2128.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2862.32   CHANNEL SLOPE =  0.0386
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.895
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      152.68      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     806.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.66
  AVERAGE FLOW DEPTH(FEET) =   4.43   TRAVEL TIME(MIN.) =   4.94
  Tc(MIN.) =   36.33
  SUBAREA AREA(ACRES) =   152.68       SUBAREA RUNOFF(CFS) =  219.18
  EFFECTIVE AREA(ACRES) =    602.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      602.1          PEAK FLOW RATE(CFS) =     864.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.58   FLOW VELOCITY(FEET/SEC.) =   9.85
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10405.00 =    9599.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2128.80  DOWNSTREAM(FEET) =   1759.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.12   CHANNEL SLOPE =  0.1878
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.848
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      139.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     961.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.03
  AVERAGE FLOW DEPTH(FEET) =   3.24   TRAVEL TIME(MIN.) =   1.82
  Tc(MIN.) =   38.15
  SUBAREA AREA(ACRES) =   139.70       SUBAREA RUNOFF(CFS) =  194.63
  EFFECTIVE AREA(ACRES) =    741.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      741.8          PEAK FLOW RATE(CFS) =    1033.54
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.36   FLOW VELOCITY(FEET/SEC.) =  18.40
  LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  10420.00 =   11566.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10405.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   38.15
  RAINFALL INTENSITY(INCH/HR) =   1.85
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     741.84
  TOTAL STREAM AREA(ACRES) =     741.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1033.54

****************************************************************************
  FLOW PROCESS FROM NODE  10410.00 TO NODE  10411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   413.10
  ELEVATION DATA: UPSTREAM(FEET) =   3217.26  DOWNSTREAM(FEET) =   3058.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.517
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.814
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        3.06      0.30     1.000     0    9.52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.43
  TOTAL AREA(ACRES) =      3.06   PEAK FLOW RATE(CFS) =     12.43

****************************************************************************
  FLOW PROCESS FROM NODE  10411.00 TO NODE  10412.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3058.86  DOWNSTREAM(FEET) =   2879.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.18   CHANNEL SLOPE =  0.3495
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.342
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.29
  AVERAGE FLOW DEPTH(FEET) =   0.30   TRAVEL TIME(MIN.) =   1.36
  Tc(MIN.) =   10.87
  SUBAREA AREA(ACRES) =     4.24       SUBAREA RUNOFF(CFS) =   15.42
  EFFECTIVE AREA(ACRES) =      7.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.3         PEAK FLOW RATE(CFS) =      26.56
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   6.97
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10412.00 =     925.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10412.00 TO NODE  10413.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.84  DOWNSTREAM(FEET) =   2644.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.24   CHANNEL SLOPE =  0.1208
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.406
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      94.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.71
  AVERAGE FLOW DEPTH(FEET) =   1.02   TRAVEL TIME(MIN.) =   4.20
  Tc(MIN.) =   15.08
  SUBAREA AREA(ACRES) =    47.95       SUBAREA RUNOFF(CFS) =  134.05
  EFFECTIVE AREA(ACRES) =     55.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.2         PEAK FLOW RATE(CFS) =     154.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =   8.98
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10413.00 =    2869.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10413.00 TO NODE  10414.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2644.97  DOWNSTREAM(FEET) =   2550.42
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.61   CHANNEL SLOPE =  0.0468
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.832
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.60      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     328.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.10
  AVERAGE FLOW DEPTH(FEET) =   2.65   TRAVEL TIME(MIN.) =   4.16
  Tc(MIN.) =   19.24
  SUBAREA AREA(ACRES) =   151.60       SUBAREA RUNOFF(CFS) =  345.42
  EFFECTIVE AREA(ACRES) =    206.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.9          PEAK FLOW RATE(CFS) =     471.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.21   FLOW VELOCITY(FEET/SEC.) =   8.95
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10414.00 =    4889.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10414.00 TO NODE  10415.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2550.42  DOWNSTREAM(FEET) =   2391.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.76   CHANNEL SLOPE =  0.0830
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.574
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      206.03      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     682.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.21
  AVERAGE FLOW DEPTH(FEET) =   3.35   TRAVEL TIME(MIN.) =   2.62
  Tc(MIN.) =   21.85
  SUBAREA AREA(ACRES) =   206.03       SUBAREA RUNOFF(CFS) =  421.71
  EFFECTIVE AREA(ACRES) =    412.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      412.9          PEAK FLOW RATE(CFS) =     845.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.74   FLOW VELOCITY(FEET/SEC.) =  12.95
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10415.00 =    6805.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10415.00 TO NODE  10416.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   2391.31  DOWNSTREAM(FEET) =   2092.16
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2843.10   CHANNEL SLOPE =  0.1052
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.77
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.311
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      122.38      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     955.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.60
 AVERAGE FLOW DEPTH(FEET) =   3.74   TRAVEL TIME(MIN.) =   3.24
 Tc(MIN.) =   25.10
 SUBAREA AREA(ACRES) =   122.38       SUBAREA RUNOFF(CFS) =  221.51
 EFFECTIVE AREA(ACRES) =    535.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      535.3         PEAK FLOW RATE(CFS) =     968.84
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.77

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.77   FLOW VELOCITY(FEET/SEC.) =  14.64
 LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10416.00 =    9648.99 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2092.16  DOWNSTREAM(FEET) =   1759.52
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2151.95   CHANNEL SLOPE =  0.1546
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.51
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.203
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       59.94      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1020.18
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.10
 AVERAGE FLOW DEPTH(FEET) =   3.51   TRAVEL TIME(MIN.) =   2.10
 Tc(MIN.) =   27.19
 SUBAREA AREA(ACRES) =    59.94       SUBAREA RUNOFF(CFS) =  102.68
 EFFECTIVE AREA(ACRES) =    595.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      595.2         PEAK FLOW RATE(CFS) =    1019.58
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.51
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.51   FLOW VELOCITY(FEET/SEC.) =  17.09
 LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10416.00 TO NODE  10420.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   27.19
 RAINFALL INTENSITY(INCH/HR) =   2.20
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     595.20
 TOTAL STREAM AREA(ACRES) =     595.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    1019.58

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1033.54   38.15    1.848  0.30( 0.30) 1.00     741.8   10400.00
     2     1019.58   27.19    2.203  0.30( 0.30) 1.00     595.2   10410.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1925.41   27.19    2.203  0.30( 0.30) 1.00    1124.0   10410.00
     2     1862.78   38.15    1.848  0.30( 0.30) 1.00    1337.0   10400.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1925.41    Tc(MIN.) =    27.19
 EFFECTIVE AREA(ACRES) =    1124.00   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1337.0
 LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10420.00 =   11800.94 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1759.52  DOWNSTREAM(FEET) =   1688.35
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2477.21   CHANNEL SLOPE =  0.0287
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.34
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.034
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED                -       72.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1982.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.97
  AVERAGE FLOW DEPTH(FEET) =   7.33   TRAVEL TIME(MIN.) =   3.76
  Tc(MIN.) =   30.96
  SUBAREA AREA(ACRES) =    72.64       SUBAREA RUNOFF(CFS) =  113.38
  EFFECTIVE AREA(ACRES) =   1196.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1409.7         PEAK FLOW RATE(CFS) =    1925.41
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.23   FLOW VELOCITY(FEET/SEC.) =  10.89
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S3.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     7443.85   40.87  0.30( 0.30) 1.00    5360.1   10200.00
      2     7423.28   46.13  0.30( 0.30) 1.00    5921.7   10300.00
      3     7414.38   46.33  0.30( 0.30) 1.00    5936.3   10320.00
      4     7060.82   50.90  0.30( 0.30) 1.00    6143.3   10210.00
      5     7033.11   74.83  0.30( 0.30) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =     6836.4

****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10332.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     7443.85   40.87  0.30( 0.30) 1.00    5360.1   10200.00
      2     7423.28   46.13  0.30( 0.30) 1.00    5921.7   10300.00
      3     7414.38   46.33  0.30( 0.30) 1.00    5936.3   10320.00
      4     7060.82   50.90  0.30( 0.30) 1.00    6143.3   10210.00
      5     7033.11   74.83  0.30( 0.30) 1.00    6836.4   10100.00
    TOTAL AREA(ACRES) =      6836.4
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  10332.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1739.96  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2238.93   CHANNEL SLOPE =  0.0231
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.80
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.697
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       61.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7482.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.87
  AVERAGE FLOW DEPTH(FEET) =   9.79   TRAVEL TIME(MIN.) =   2.90
  Tc(MIN.) =   43.77
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =   77.86
  EFFECTIVE AREA(ACRES) =   5422.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6898.3         PEAK FLOW RATE(CFS) =    7443.85
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.77   FLOW VELOCITY(FEET/SEC.) =  12.85
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7443.85   43.77    1.697  0.30( 0.30) 1.00    5422.1   10200.00
      2     7423.28   49.03    1.553  0.30( 0.30) 1.00    5983.7   10300.00
      3     7414.38   49.23    1.547  0.30( 0.30) 1.00    5998.2   10320.00
      4     7060.82   53.84    1.511  0.30( 0.30) 1.00    6205.2   10210.00
      5     7033.11   77.78    1.375  0.30( 0.30) 1.00    6898.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1925.41   30.96    2.034  0.30( 0.30) 1.00    1196.6   10410.00
      2     1862.78   41.95    1.747  0.30( 0.30) 1.00    1409.7   10400.00
  LONGEST FLOWPATH FROM NODE  10410.00 TO NODE  10507.00 =   14278.15 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8461.75	30.96	2.034	0.30(0.30)	1.00	5031.5	10410.00
2	9251.79	41.95	1.747	0.30(0.30)	1.00	6606.6	10400.00
3	9242.51	43.77	1.697	0.30(0.30)	1.00	6831.7	10200.00
4	9036.22	49.03	1.553	0.30(0.30)	1.00	7393.3	10300.00
5	9020.18	49.23	1.547	0.30(0.30)	1.00	7407.9	10320.00
6	8620.80	53.84	1.511	0.30(0.30)	1.00	7614.9	10210.00
7	8417.18	77.78	1.375	0.30(0.30)	1.00	8308.0	10100.00

TOTAL AREA(ACRES) = 8308.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 9251.79 Tc(MIN.) = 41.950
EFFECTIVE AREA(ACRES) = 6606.59 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 8308.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 8308.0 TC(MIN.) = 41.95
EFFECTIVE AREA(ACRES) = 6606.59 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998
PEAK FLOW RATE(CFS) = 9251.79

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8461.75	30.96	2.034	0.30(0.30)	1.00	5031.5	10410.00
2	9251.79	41.95	1.747	0.30(0.30)	1.00	6606.6	10400.00
3	9242.51	43.77	1.697	0.30(0.30)	1.00	6831.7	10200.00
4	9036.22	49.03	1.553	0.30(0.30)	1.00	7393.3	10300.00
5	9020.18	49.23	1.547	0.30(0.30)	1.00	7407.9	10320.00
6	8620.80	53.84	1.511	0.30(0.30)	1.00	7614.9	10210.00
7	8417.18	77.78	1.375	0.30(0.30)	1.00	8308.0	10100.00

==========

==========

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S5.DAT
  TIME/DATE OF STUDY: 09:57 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  7.393
   2)   10.00;  4.538
   3)   15.00;  3.417
   4)   20.00;  2.726
   5)   25.00;  2.316
   6)   30.00;  2.059
   7)   40.00;  1.800
   8)   50.00;  1.526
   9)   60.00;  1.488
  10)   90.00;  1.297
  11)  120.00;  1.166
  12)  180.00;  1.004
  13)  360.00;  0.780
  14) 1440.00;  0.354
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10500.00 TO NODE  10501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.64
  ELEVATION DATA: UPSTREAM(FEET) =   3108.31  DOWNSTREAM(FEET) =   3060.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.565
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.499
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          -        1.54      0.30     0.910      0    6.57
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
  SUBAREA RUNOFF(CFS) =      8.63
  TOTAL AREA(ACRES) =      1.54   PEAK FLOW RATE(CFS) =      8.63

**************************************************************************
  FLOW PROCESS FROM NODE  10501.00 TO NODE  10502.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3060.24  DOWNSTREAM(FEET) =   2942.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   690.48   CHANNEL SLOPE =  0.1703
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.324
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.27      0.30     0.943      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.943
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.59
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =    8.62
  SUBAREA AREA(ACRES) =     8.27       SUBAREA RUNOFF(CFS) =   37.52
  EFFECTIVE AREA(ACRES) =      9.81     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =        9.8          PEAK FLOW RATE(CFS) =      44.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   6.65
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10502.00 =     986.12 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10502.00 TO NODE  10503.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2942.64  DOWNSTREAM(FEET) =   2815.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   957.31   CHANNEL SLOPE =  0.1331
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.369
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      79.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.49
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   2.13
  Tc(MIN.) =   10.75
  SUBAREA AREA(ACRES) =    18.91       SUBAREA RUNOFF(CFS) =   69.25
  EFFECTIVE AREA(ACRES) =     28.72     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       28.7         PEAK FLOW RATE(CFS) =     105.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   8.22
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10503.00 =    1943.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10503.00 TO NODE  10504.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2815.24  DOWNSTREAM(FEET) =   2202.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2096.20   CHANNEL SLOPE =  0.2923
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.798
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.49      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     224.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.72
  AVERAGE FLOW DEPTH(FEET) =   1.30   TRAVEL TIME(MIN.) =   2.55
  Tc(MIN.) =   13.30
  SUBAREA AREA(ACRES) =    75.49       SUBAREA RUNOFF(CFS) =  237.65
  EFFECTIVE AREA(ACRES) =    104.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =     328.23
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =  15.46
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10504.00 =    4039.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10504.00 TO NODE  10505.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2202.44  DOWNSTREAM(FEET) =   1969.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.32   CHANNEL SLOPE =  0.0834
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.55
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.125
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      278.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     683.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.24
  AVERAGE FLOW DEPTH(FEET) =   3.35   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   17.11
  SUBAREA AREA(ACRES) =   278.21       SUBAREA RUNOFF(CFS) =  707.35
  EFFECTIVE AREA(ACRES) =    382.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      382.4         PEAK FLOW RATE(CFS) =     972.47
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.01   FLOW VELOCITY(FEET/SEC.) =  13.47
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10505.00 =    6839.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10505.00 TO NODE  10506.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1969.00  DOWNSTREAM(FEET) =   1759.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.99   CHANNEL SLOPE =  0.0725
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.678
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      323.47      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1319.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.88
  AVERAGE FLOW DEPTH(FEET) =   4.83   TRAVEL TIME(MIN.) =   3.47
  Tc(MIN.) =   20.59
  SUBAREA AREA(ACRES) =   323.47       SUBAREA RUNOFF(CFS) =  692.28
  EFFECTIVE AREA(ACRES) =    705.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      705.9         PEAK FLOW RATE(CFS) =    1510.89
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.16   FLOW VELOCITY(FEET/SEC.) =  14.40
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10506.00 =    9732.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1759.23  DOWNSTREAM(FEET) =   1688.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2597.28   CHANNEL SLOPE =  0.0273
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.98
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.335
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.34      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1705.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.35
  AVERAGE FLOW DEPTH(FEET) =   6.92   TRAVEL TIME(MIN.) =   4.18
  Tc(MIN.) =   24.77
  SUBAREA AREA(ACRES) =   212.34       SUBAREA RUNOFF(CFS) =  388.90
  EFFECTIVE AREA(ACRES) =    918.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      918.2         PEAK FLOW RATE(CFS) =    1681.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.87   FLOW VELOCITY(FEET/SEC.) =  10.31
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      918.2  TC(MIN.) =     24.77
  EFFECTIVE AREA(ACRES) =    918.23  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =    1681.90
============================================================================
```



```
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S6.DAT
  TIME/DATE OF STUDY: 09:57 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  7.289
   2)   10.00;  4.486
   3)   15.00;  3.384
   4)   20.00;  2.705
   5)   25.00;  2.301
   6)   30.00;  2.047
   7)   40.00;  1.787
   8)   50.00;  1.517
   9)   60.00;  1.475
  10)   90.00;  1.283
  11)  120.00;  1.152
  12)  180.00;  0.989
  13)  360.00;  0.767
  14) 1440.00;  0.348
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10600.00 TO NODE  10601.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   312.13
  ELEVATION DATA: UPSTREAM(FEET) =   3250.51  DOWNSTREAM(FEET) =   3126.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.451
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.354
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.47      0.30     1.000      0    8.45
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.24
  TOTAL AREA(ACRES) =      2.47   PEAK FLOW RATE(CFS) =     11.24

**************************************************************************
  FLOW PROCESS FROM NODE  10601.00 TO NODE  10602.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3126.78  DOWNSTREAM(FEET) =   2951.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.40   CHANNEL SLOPE =  0.2828
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.462
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.58      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.23
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   1.66
  Tc(MIN.) =   10.11
  SUBAREA AREA(ACRES) =     6.58       SUBAREA RUNOFF(CFS) =   24.64
  EFFECTIVE AREA(ACRES) =      9.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =      33.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.44   FLOW VELOCITY(FEET/SEC.) =   7.12
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10602.00 =     932.53 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10602.00 TO NODE  10603.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2951.30  DOWNSTREAM(FEET) =   2641.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1930.18   CHANNEL SLOPE =  0.1606
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.703
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     127.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.34
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   13.55
  SUBAREA AREA(ACRES) =    60.78       SUBAREA RUNOFF(CFS) =  186.13
  EFFECTIVE AREA(ACRES) =     69.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.8         PEAK FLOW RATE(CFS) =     213.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =  10.98
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10603.00 =    2862.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10603.00 TO NODE  10604.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2641.28  DOWNSTREAM(FEET) =   2318.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1966.90   CHANNEL SLOPE =  0.1640
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.219
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     304.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.34
  AVERAGE FLOW DEPTH(FEET) =   1.81   TRAVEL TIME(MIN.) =   2.66
  Tc(MIN.) =   16.21
  SUBAREA AREA(ACRES) =    68.78       SUBAREA RUNOFF(CFS) =  180.72
  EFFECTIVE AREA(ACRES) =    138.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      138.6         PEAK FLOW RATE(CFS) =     364.20
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.00   FLOW VELOCITY(FEET/SEC.) =  12.99
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10604.00 =    4829.61 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10604.00 TO NODE  10605.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2318.61  DOWNSTREAM(FEET) =   1983.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2601.81   CHANNEL SLOPE =  0.1286
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.784
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      178.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     564.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.54
  AVERAGE FLOW DEPTH(FEET) =   2.70   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   19.41
  SUBAREA AREA(ACRES) =   178.16       SUBAREA RUNOFF(CFS) =  398.38
  EFFECTIVE AREA(ACRES) =    316.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      316.8         PEAK FLOW RATE(CFS) =     708.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.05   FLOW VELOCITY(FEET/SEC.) =  14.44
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10605.00 =    7431.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1983.94  DOWNSTREAM(FEET) =   1655.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2439.06   CHANNEL SLOPE =  0.1348
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.534
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.31      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     769.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.06
  AVERAGE FLOW DEPTH(FEET) =   3.14   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   22.11
  SUBAREA AREA(ACRES) =    61.31       SUBAREA RUNOFF(CFS) =  123.28
  EFFECTIVE AREA(ACRES) =    378.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      378.1          PEAK FLOW RATE(CFS) =     760.25
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.12   FLOW VELOCITY(FEET/SEC.) =  14.98
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10620.00 =    9870.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10605.00 TO NODE  10620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S4.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     8461.75   30.96  0.30( 0.30) 1.00    5031.5   10410.00
      2     9251.79   41.95  0.30( 0.30) 1.00    6606.6   10400.00
      3     9242.51   43.77  0.30( 0.30) 1.00    6831.7   10200.00
      4     9036.22   49.03  0.30( 0.30) 1.00    7393.3   10300.00
      5     9020.18   49.23  0.30( 0.30) 1.00    7407.9   10320.00
      6     8620.80   53.84  0.30( 0.30) 1.00    7614.9   10210.00
      7     8417.18   77.78  0.30( 0.30) 1.00    8308.0   10100.00
    TOTAL AREA(ACRES) =     8308.0

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S5.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1681.90   24.77  0.30( 0.30) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =      918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10507.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
```



```
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1681.90   24.77  0.30( 0.30) 1.00     918.2   10500.00
    TOTAL AREA(ACRES) =      918.2

****************************************************************************
  FLOW PROCESS FROM NODE  10420.00 TO NODE  10507.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1681.90   24.77    2.320  0.30( 0.30) 1.00     918.2   10500.00
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =   12330.22 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     8461.75   30.96    2.022  0.30( 0.30) 1.00    5031.5   10410.00
      2     9251.79   41.95    1.734  0.30( 0.30) 1.00    6606.6   10400.00
      3     9242.51   43.77    1.685  0.30( 0.30) 1.00    6831.7   10200.00
      4     9036.22   49.03    1.543  0.30( 0.30) 1.00    7393.3   10300.00
      5     9020.18   49.23    1.538  0.30( 0.30) 1.00    7407.9   10320.00
      6     8620.80   53.84    1.501  0.30( 0.30) 1.00    7614.9   10210.00
      7     8417.18   77.78    1.361  0.30( 0.30) 1.00    8308.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9621.81   24.77    2.320  0.30( 0.30) 1.00    4944.2   10500.00
      2     9895.93   30.96    2.022  0.30( 0.30) 1.00    5949.7   10410.00
      3    10446.32   41.95    1.734  0.30( 0.30) 1.00    7524.8   10400.00
      4    10396.19   43.77    1.685  0.30( 0.30) 1.00    7750.0   10200.00
      5    10071.55   49.03    1.543  0.30( 0.30) 1.00    8311.6   10300.00
      6    10050.98   49.23    1.538  0.30( 0.30) 1.00    8326.1   10320.00
      7     9620.93   53.84    1.501  0.30( 0.30) 1.00    8533.1   10210.00
      8     9301.02   77.78    1.361  0.30( 0.30) 1.00    9226.2   10100.00
    TOTAL AREA(ACRES) =      9226.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    10446.32  Tc(MIN.) =   41.950
  EFFECTIVE AREA(ACRES) =   7524.82  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     9226.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10507.00 =   35292.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10507.00 TO NODE  10620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

ELEVATION DATA: UPSTREAM(FEET) = 1688.35 DOWNSTREAM(FEET) = 1655.24
CHANNEL LENGTH THRU SUBAREA(FEET) = 2570.61 CHANNEL SLOPE = 0.0129
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.26
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.632
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.74	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10496.53
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.36
AVERAGE FLOW DEPTH(FEET) = 13.25 TRAVEL TIME(MIN.) = 3.77
Tc(MIN.) = 45.72
SUBAREA AREA(ACRES) = 83.74 SUBAREA RUNOFF(CFS) = 100.43
EFFECTIVE AREA(ACRES) = 7608.56 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 9310.0 PEAK FLOW RATE(CFS) = 10446.32
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 13.22 FLOW VELOCITY(FEET/SEC.) = 11.35
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

****
FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9621.81	28.62	2.117	0.30(0.30)	1.00	5027.9	10500.00
2	9895.93	34.78	1.923	0.30(0.30)	1.00	6033.5	10410.00
3	10446.32	45.72	1.632	0.30(0.30)	1.00	7608.6	10400.00
4	10396.19	47.54	1.583	0.30(0.30)	1.00	7833.7	10200.00
5	10071.55	52.84	1.505	0.30(0.30)	1.00	8395.3	10300.00
6	10050.98	53.05	1.504	0.30(0.30)	1.00	8409.9	10320.00
7	9620.93	57.70	1.485	0.30(0.30)	1.00	8616.8	10210.00
8	9301.02	81.67	1.336	0.30(0.30)	1.00	9310.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	760.25	22.11	2.534	0.30(0.30)	1.00	378.1	10600.00

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10620.00 = 9870.48 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9900.79	22.11	2.534	0.30(0.30)	1.00	4262.9	10600.00

2	10240.13	28.62	2.117	0.30(0.30)	1.00	5406.0	10500.00
3	10448.11	34.78	1.923	0.30(0.30)	1.00	6411.6	10410.00
4	10899.75	45.72	1.632	0.30(0.30)	1.00	7986.6	10400.00
5	10832.88	47.54	1.583	0.30(0.30)	1.00	8211.8	10200.00
6	10481.63	52.84	1.505	0.30(0.30)	1.00	8773.4	10300.00
7	10460.76	53.05	1.504	0.30(0.30)	1.00	8787.9	10320.00
8	10024.06	57.70	1.485	0.30(0.30)	1.00	8994.9	10210.00
9	9653.67	81.67	1.336	0.30(0.30)	1.00	9688.1	10100.00

TOTAL AREA(ACRES) = 9688.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 10899.75 Tc(MIN.) = 45.722
EFFECTIVE AREA(ACRES) = 7986.64 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 9688.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

****
FLOW PROCESS FROM NODE 10620.00 TO NODE 10621.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1655.24 DOWNSTREAM(FEET) = 1584.84
CHANNEL LENGTH THRU SUBAREA(FEET) = 2294.47 CHANNEL SLOPE = 0.0307
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.08
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.567
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	342.43	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11095.08
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.87
AVERAGE FLOW DEPTH(FEET) = 11.07 TRAVEL TIME(MIN.) = 2.41
Tc(MIN.) = 48.13
SUBAREA AREA(ACRES) = 342.43 SUBAREA RUNOFF(CFS) = 390.62
EFFECTIVE AREA(ACRES) = 8329.07 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 10030.5 PEAK FLOW RATE(CFS) = 10899.75
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.97 FLOW VELOCITY(FEET/SEC.) = 15.80
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10621.00 = 40157.45 FEET.

****
FLOW PROCESS FROM NODE 10621.00 TO NODE 10640.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==

```
  ELEVATION DATA: UPSTREAM(FEET) =   1584.84  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2923.79   CHANNEL SLOPE =  0.0482
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.514
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      160.90      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   10987.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.68
  AVERAGE FLOW DEPTH(FEET) =   9.87   TRAVEL TIME(MIN.) =   2.61
  Tc(MIN.) =   50.74
  SUBAREA AREA(ACRES) =   160.90       SUBAREA RUNOFF(CFS) =  175.79
  EFFECTIVE AREA(ACRES) =   8489.97     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10191.4         PEAK FLOW RATE(CFS) =   10899.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.83   FLOW VELOCITY(FEET/SEC.) =  18.64
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10621.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   50.74
  RAINFALL INTENSITY(INCH/HR) =   1.51
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    8489.97
  TOTAL STREAM AREA(ACRES) =   10191.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   10899.75

****************************************************************************
  FLOW PROCESS FROM NODE  10630.00 TO NODE  10631.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.79
  ELEVATION DATA: UPSTREAM(FEET) =   3257.00  DOWNSTREAM(FEET) =   3147.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.430
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.366
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.25      0.30     1.000     0    8.43
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.70
  TOTAL AREA(ACRES) =      1.25   PEAK FLOW RATE(CFS) =      5.70

****************************************************************************
  FLOW PROCESS FROM NODE  10631.00 TO NODE  10632.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3147.13  DOWNSTREAM(FEET) =   2774.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   640.96   CHANNEL SLOPE =  0.5817
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.469
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.75      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.49
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   1.65
  Tc(MIN.) =   10.08
  SUBAREA AREA(ACRES) =     4.75       SUBAREA RUNOFF(CFS) =   17.82
  EFFECTIVE AREA(ACRES) =      6.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      22.51
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   7.69
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10632.00 =     939.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10632.00 TO NODE  10633.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2774.29  DOWNSTREAM(FEET) =   2004.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.65   CHANNEL SLOPE =  0.4039
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.02
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.952
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED                -       79.75      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.53
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   2.35
  Tc(MIN.) =   12.42
  SUBAREA AREA(ACRES) =    79.75       SUBAREA RUNOFF(CFS) =  262.11
  EFFECTIVE AREA(ACRES) =     85.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       85.8          PEAK FLOW RATE(CFS) =     281.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =  16.47
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10633.00 =    2845.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10633.00 TO NODE  10634.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2004.58  DOWNSTREAM(FEET) =   1714.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1868.05   CHANNEL SLOPE =  0.1550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.449
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      124.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     458.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.65
  AVERAGE FLOW DEPTH(FEET) =   2.30   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =   14.71
  SUBAREA AREA(ACRES) =   124.45       SUBAREA RUNOFF(CFS) =  352.71
  EFFECTIVE AREA(ACRES) =    210.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      210.2         PEAK FLOW RATE(CFS) =     595.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.64   FLOW VELOCITY(FEET/SEC.) =  14.73
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10634.00 =    4713.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1714.99  DOWNSTREAM(FEET) =   1443.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.34   CHANNEL SLOPE =  0.1609
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.175
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       42.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     650.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.30
  AVERAGE FLOW DEPTH(FEET) =   2.74   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   16.54
  SUBAREA AREA(ACRES) =    42.00       SUBAREA RUNOFF(CFS) =  108.67
  EFFECTIVE AREA(ACRES) =    252.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.2         PEAK FLOW RATE(CFS) =     652.51
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.75   FLOW VELOCITY(FEET/SEC.) =  15.30
  LONGEST FLOWPATH FROM NODE  10630.00 TO NODE  10640.00 =    6398.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10634.00 TO NODE  10640.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.54
  RAINFALL INTENSITY(INCH/HR) =   3.17
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     252.20
  TOTAL STREAM AREA(ACRES) =     252.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     652.51

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9900.79   27.25    2.187  0.30( 0.30) 1.00    4766.3   10600.00
      1    10240.13   33.72    1.950  0.30( 0.30) 1.00    5909.3   10500.00
      1    10448.11   39.85    1.791  0.30( 0.30) 1.00    6914.9   10410.00
      1    10899.75   50.74    1.514  0.30( 0.30) 1.00    8490.0   10400.00
      1    10832.88   52.57    1.506  0.30( 0.30) 1.00    8715.1   10200.00
      1    10481.63   57.91    1.484  0.30( 0.30) 1.00    9276.7   10300.00
      1    10460.76   58.12    1.483  0.30( 0.30) 1.00    9291.3   10320.00
      1    10024.06   62.83    1.457  0.30( 0.30) 1.00    9498.3   10210.00
      1     9653.67   86.86    1.303  0.30( 0.30) 1.00   10191.4   10100.00
```

```
    2      652.51   16.54    3.175  0.30( 0.30) 1.00     252.2   10630.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9808.97   16.54    3.175  0.30( 0.30) 1.00    3145.3   10630.00
      2    10329.04   27.25    2.187  0.30( 0.30) 1.00    5018.5   10600.00
      3    10614.75   33.72    1.950  0.30( 0.30) 1.00    6161.5   10500.00
      4    10786.51   39.85    1.791  0.30( 0.30) 1.00    7167.1   10410.00
      5    11175.30   50.74    1.514  0.30( 0.30) 1.00    8742.2   10400.00
      6    11106.67   52.57    1.506  0.30( 0.30) 1.00    8967.3   10200.00
      7    10750.34   57.91    1.484  0.30( 0.30) 1.00    9528.9   10300.00
      8    10729.27   58.12    1.483  0.30( 0.30) 1.00    9543.5   10320.00
      9    10286.67   62.83    1.457  0.30( 0.30) 1.00    9750.5   10210.00
     10     9881.37   86.86    1.303  0.30( 0.30) 1.00   10443.6   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   11175.30    Tc(MIN.) =    50.74
  EFFECTIVE AREA(ACRES) =    8742.17   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    10443.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10640.00 =   43081.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1443.87  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2254.45   CHANNEL SLOPE =  0.0548
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.506
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   11226.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.69
  AVERAGE FLOW DEPTH(FEET) =   9.66   TRAVEL TIME(MIN.) =   1.91
  Tc(MIN.) =   52.65
  SUBAREA AREA(ACRES) =    94.37       SUBAREA RUNOFF(CFS) =  102.42
  EFFECTIVE AREA(ACRES) =   8836.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    10538.0         PEAK FLOW RATE(CFS) =   11175.30
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```



```
  DEPTH(FEET) =  9.64   FLOW VELOCITY(FEET/SEC.) =  19.67
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    10538.0  TC(MIN.) =     52.65
  EFFECTIVE AREA(ACRES) =   8836.54  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =   11175.30

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9808.97   18.51    2.907  0.30( 0.30) 1.00    3239.7   10630.00
      2    10329.04   29.20    2.088  0.30( 0.30) 1.00    5112.8   10600.00
      3    10614.75   35.65    1.900  0.30( 0.30) 1.00    6255.9   10500.00
      4    10786.51   41.78    1.739  0.30( 0.30) 1.00    7261.5   10410.00
      5    11175.30   52.65    1.506  0.30( 0.30) 1.00    8836.5   10400.00
      6    11106.67   54.48    1.498  0.30( 0.30) 1.00    9061.7   10200.00
      7    10750.34   59.84    1.476  0.30( 0.30) 1.00    9623.3   10300.00
      8    10729.27   60.05    1.475  0.30( 0.30) 1.00    9637.8   10320.00
      9    10286.67   64.78    1.444  0.30( 0.30) 1.00    9844.8   10210.00
     10     9881.37   88.83    1.290  0.30( 0.30) 1.00   10538.0   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S7.DAT
  TIME/DATE OF STUDY: 09:57 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  7.289
   2)   10.00;  4.486
   3)   15.00;  3.384
   4)   20.00;  2.705
   5)   25.00;  2.301
   6)   30.00;  2.047
   7)   40.00;  1.787
   8)   50.00;  1.517
   9)   60.00;  1.475
  10)   90.00;  1.283
  11)  120.00;  1.152
  12)  180.00;  0.989
  13)  360.00;  0.767
  14) 1440.00;  0.348
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10700.00 TO NODE  10701.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   281.18
  ELEVATION DATA: UPSTREAM(FEET) =   3512.68  DOWNSTREAM(FEET) =   3444.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.938
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.081
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.30      0.30     1.000     0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.59
  TOTAL AREA(ACRES) =      1.30   PEAK FLOW RATE(CFS) =      5.59

************************************************************************
  FLOW PROCESS FROM NODE  10701.00 TO NODE  10702.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3444.33  DOWNSTREAM(FEET) =   3246.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   700.05   CHANNEL SLOPE =  0.2823
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.257
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.49      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.55
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   2.10
  Tc(MIN.) =   11.04
  SUBAREA AREA(ACRES) =     6.49       SUBAREA RUNOFF(CFS) =   23.11
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8          PEAK FLOW RATE(CFS) =      27.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   6.67
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10702.00 =     981.23 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10702.00 TO NODE  10703.00 IS CODE =  56
```

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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3246.68  DOWNSTREAM(FEET) =   3075.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1893.56   CHANNEL SLOPE =  0.0906
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.04
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.244
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.98      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.32
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   4.99
  Tc(MIN.) =   16.03
  SUBAREA AREA(ACRES) =    31.98       SUBAREA RUNOFF(CFS) =   84.74
  EFFECTIVE AREA(ACRES) =     39.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       39.8         PEAK FLOW RATE(CFS) =     105.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.18   FLOW VELOCITY(FEET/SEC.) =   7.23
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.00 =    2874.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.00 TO NODE  10703.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3075.14  DOWNSTREAM(FEET) =   2952.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2060.61   CHANNEL SLOPE =  0.0597
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.624
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.58      0.30     0.872     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.872
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     142.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.90
  AVERAGE FLOW DEPTH(FEET) =   1.57   TRAVEL TIME(MIN.) =   4.98
  Tc(MIN.) =   21.01
  SUBAREA AREA(ACRES) =    34.58       SUBAREA RUNOFF(CFS) =   73.51
  EFFECTIVE AREA(ACRES) =     74.35     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       74.4         PEAK FLOW RATE(CFS) =     156.69
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.66   FLOW VELOCITY(FEET/SEC.) =   7.09
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10703.50 =    4935.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10703.50 TO NODE  10704.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2952.03  DOWNSTREAM(FEET) =   2895.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.70   CHANNEL SLOPE =  0.0606
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.83
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.457
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.69      0.30     0.951     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     186.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.52
  AVERAGE FLOW DEPTH(FEET) =   1.82   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =   23.07
  SUBAREA AREA(ACRES) =    30.69       SUBAREA RUNOFF(CFS) =   59.98
  EFFECTIVE AREA(ACRES) =    105.04     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      105.0         PEAK FLOW RATE(CFS) =     205.51
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.92   FLOW VELOCITY(FEET/SEC.) =   7.74
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10704.00 =    5866.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2895.59  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2585.44   CHANNEL SLOPE =  0.1217
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.214
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.40      0.30     0.977     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     378.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.83
  AVERAGE FLOW DEPTH(FEET) =   2.22   TRAVEL TIME(MIN.) =   3.64
  Tc(MIN.) =   26.71
  SUBAREA AREA(ACRES) =   199.40       SUBAREA RUNOFF(CFS) =  344.73
  EFFECTIVE AREA(ACRES) =    304.44     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      304.4          PEAK FLOW RATE(CFS) =     527.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.64   FLOW VELOCITY(FEET/SEC.) =  13.04
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10704.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.71
  RAINFALL INTENSITY(INCH/HR) =   2.21
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     304.44
  TOTAL STREAM AREA(ACRES) =     304.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     527.27

****************************************************************************
  FLOW PROCESS FROM NODE  10710.00 TO NODE  10711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.64
  ELEVATION DATA: UPSTREAM(FEET) =   3389.13  DOWNSTREAM(FEET) =   3276.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.438
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.169
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                -        7.76      0.30     0.981     0   11.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.981
  SUBAREA RUNOFF(CFS) =     27.06
  TOTAL AREA(ACRES) =      7.76   PEAK FLOW RATE(CFS) =     27.06

****************************************************************************
  FLOW PROCESS FROM NODE  10711.00 TO NODE  10712.00 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3276.30  DOWNSTREAM(FEET) =   3152.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   950.69   CHANNEL SLOPE =  0.1305
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.657
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.39      0.30     0.988     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.988
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      61.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.82
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   2.32
  Tc(MIN.) =   13.76
  SUBAREA AREA(ACRES) =    22.39       SUBAREA RUNOFF(CFS) =   67.72
  EFFECTIVE AREA(ACRES) =     30.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       30.1          PEAK FLOW RATE(CFS) =      91.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =   7.79
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10712.00 =    1894.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10712.00 TO NODE  10713.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3152.26  DOWNSTREAM(FEET) =   2879.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.77   CHANNEL SLOPE =  0.1431
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.090
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       42.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     144.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.36
  AVERAGE FLOW DEPTH(FEET) =   1.24   TRAVEL TIME(MIN.) =   3.40
  Tc(MIN.) =   17.16
  SUBAREA AREA(ACRES) =    42.59       SUBAREA RUNOFF(CFS) =  106.95
  EFFECTIVE AREA(ACRES) =     72.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       72.7          PEAK FLOW RATE(CFS) =     182.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

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  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =  10.06
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10713.00 =    3804.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2879.03  DOWNSTREAM(FEET) =   2581.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2621.96   CHANNEL SLOPE =  0.1136
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.620
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      156.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     347.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.26
  AVERAGE FLOW DEPTH(FEET) =   2.15   TRAVEL TIME(MIN.) =   3.88
  Tc(MIN.) =   21.05
  SUBAREA AREA(ACRES) =   156.72       SUBAREA RUNOFF(CFS) =  327.31
  EFFECTIVE AREA(ACRES) =    229.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      229.5         PEAK FLOW RATE(CFS) =     479.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.56   FLOW VELOCITY(FEET/SEC.) =  12.38
  LONGEST FLOWPATH FROM NODE  10710.00 TO NODE  10720.00 =    6426.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.05
  RAINFALL INTENSITY(INCH/HR) =   2.62
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     229.46
  TOTAL STREAM AREA(ACRES) =     229.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     479.34
```



```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      527.27   26.71    2.214  0.30( 0.29) 0.97      304.4   10700.00
      2      479.34   21.05    2.620  0.30( 0.30) 1.00      229.5   10710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      982.50   21.05    2.620  0.30( 0.29) 0.98      469.3   10710.00
      2      922.66   26.71    2.214  0.30( 0.29) 0.98      533.9   10700.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     982.50    Tc(MIN.) =    21.05
  EFFECTIVE AREA(ACRES) =     469.31   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =      533.9
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.00 =    8451.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.00 TO NODE  10720.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2581.07  DOWNSTREAM(FEET) =   2523.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.13   CHANNEL SLOPE =  0.0339
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.34
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.391
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1092.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.99
  AVERAGE FLOW DEPTH(FEET) =   5.31   TRAVEL TIME(MIN.) =   2.84
  Tc(MIN.) =   23.88
  SUBAREA AREA(ACRES) =   116.31       SUBAREA RUNOFF(CFS) =  218.93
  EFFECTIVE AREA(ACRES) =    585.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      650.2         PEAK FLOW RATE(CFS) =    1104.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.34   FLOW VELOCITY(FEET/SEC.) =  10.02
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10720.50 =   10150.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10720.50 TO NODE  10721.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2523.48  DOWNSTREAM(FEET) =   2488.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1575.08   CHANNEL SLOPE =  0.0221
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.11
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.204
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1175.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.70
  AVERAGE FLOW DEPTH(FEET) =   6.09   TRAVEL TIME(MIN.) =   3.02
  Tc(MIN.) =   26.90
  SUBAREA AREA(ACRES) =    82.28       SUBAREA RUNOFF(CFS) =  141.04
  EFFECTIVE AREA(ACRES) =    667.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      732.5         PEAK FLOW RATE(CFS) =    1147.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.02   FLOW VELOCITY(FEET/SEC.) =   8.64
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.00 =   11725.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.00 TO NODE  10721.50 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2488.66  DOWNSTREAM(FEET) =   2453.35
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2032.11   CHANNEL SLOPE =  0.0174
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.021
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      259.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1348.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   6.88   TRAVEL TIME(MIN.) =   4.11
  Tc(MIN.) =   31.01
  SUBAREA AREA(ACRES) =   259.52       SUBAREA RUNOFF(CFS) =  401.92
  EFFECTIVE AREA(ACRES) =    927.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      992.0         PEAK FLOW RATE(CFS) =    1438.66
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.10   FLOW VELOCITY(FEET/SEC.) =   8.38
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10721.50 =   13757.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10721.50 TO NODE  10722.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.35  DOWNSTREAM(FEET) =   2384.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1842.37   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.951
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      229.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1609.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.46
  AVERAGE FLOW DEPTH(FEET) =   6.25   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   33.69
  SUBAREA AREA(ACRES) =   229.78       SUBAREA RUNOFF(CFS) =  341.45
  EFFECTIVE AREA(ACRES) =   1157.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1221.8         PEAK FLOW RATE(CFS) =    1721.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.45   FLOW VELOCITY(FEET/SEC.) =  11.66
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10722.00 =   15600.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10722.00 TO NODE  10723.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2384.52  DOWNSTREAM(FEET) =   1925.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3780.37   CHANNEL SLOPE =  0.1214
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.863
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      308.58      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1939.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.57
  AVERAGE FLOW DEPTH(FEET) =   5.15   TRAVEL TIME(MIN.) =   3.39
  Tc(MIN.) =   37.08
  SUBAREA AREA(ACRES) =   308.58       SUBAREA RUNOFF(CFS) =  434.05
  EFFECTIVE AREA(ACRES) =   1465.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1530.4          PEAK FLOW RATE(CFS) =    2064.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.30   FLOW VELOCITY(FEET/SEC.) =  18.91
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10723.00 =   19380.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1925.64  DOWNSTREAM(FEET) =   1320.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3826.73   CHANNEL SLOPE =  0.1582
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.786
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      434.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2354.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.57
  AVERAGE FLOW DEPTH(FEET) =   5.30   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   40.04
  SUBAREA AREA(ACRES) =   434.11       SUBAREA RUNOFF(CFS) =  580.57
  EFFECTIVE AREA(ACRES) =   1899.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1964.5          PEAK FLOW RATE(CFS) =    2543.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.50   FLOW VELOCITY(FEET/SEC.) =  22.00
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     1964.5  TC(MIN.) =     40.04
  EFFECTIVE AREA(ACRES) =   1899.89  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.995
  PEAK FLOW RATE(CFS)   =    2543.24
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     2543.24   40.04    1.786  0.30( 0.30) 1.00    1899.9   10710.00
      2     2346.69   45.98    1.626  0.30( 0.30) 0.99    1964.5   10700.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2010 Advanced Engineering Software (aes)
             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:




------------------------------------------------------------------------
  FILE NAME: S8.DAT
  TIME/DATE OF STUDY: 09:57 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  7.056
   2)   10.00;  4.371
   3)   15.00;  3.309
   4)   20.00;  2.658
   5)   25.00;  2.267
   6)   30.00;  2.018
   7)   40.00;  1.759
   8)   50.00;  1.498
   9)   60.00;  1.444
  10)   90.00;  1.251
  11)  120.00;  1.119
  12)  180.00;  0.957
  13)  360.00;  0.738
  14) 1440.00;  0.333
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  10800.00 TO NODE  10801.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.93
  ELEVATION DATA: UPSTREAM(FEET) =   2617.19  DOWNSTREAM(FEET) =   2506.15

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.540
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.692
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.83      0.30     1.000     0    7.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.03
  TOTAL AREA(ACRES) =      0.83   PEAK FLOW RATE(CFS) =      4.03

************************************************************************
  FLOW PROCESS FROM NODE  10801.00 TO NODE  10802.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2506.15  DOWNSTREAM(FEET) =   2237.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.01   CHANNEL SLOPE =  0.3968
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.646
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.79
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   1.95
  Tc(MIN.) =    9.49
  SUBAREA AREA(ACRES) =     5.30       SUBAREA RUNOFF(CFS) =   20.73
  EFFECTIVE AREA(ACRES) =      6.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =      23.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   6.97
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10802.00 =     925.94 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  10802.00 TO NODE  10803.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2237.54  DOWNSTREAM(FEET) =   1920.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =   954.74   CHANNEL SLOPE =  0.3325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.103
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.98
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   1.77
  Tc(MIN.) =   11.26
  SUBAREA AREA(ACRES) =    18.25       SUBAREA RUNOFF(CFS) =   62.47
  EFFECTIVE AREA(ACRES) =     24.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.4         PEAK FLOW RATE(CFS) =      83.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =  10.35
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10803.00 =    1880.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1920.11  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2201.18   CHANNEL SLOPE =  0.2865
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.508
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.99      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     198.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.08
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   14.06
  SUBAREA AREA(ACRES) =    78.99       SUBAREA RUNOFF(CFS) =  228.06
  EFFECTIVE AREA(ACRES) =    103.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      103.4         PEAK FLOW RATE(CFS) =     298.45
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.54   FLOW VELOCITY(FEET/SEC.) =  14.86
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S6.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     9808.97   18.51  0.30( 0.30) 1.00    3239.7   10630.00
      2    10329.04   29.20  0.30( 0.30) 1.00    5112.8   10600.00
      3    10614.75   35.65  0.30( 0.30) 1.00    6255.9   10500.00
      4    10786.51   41.78  0.30( 0.30) 1.00    7261.5   10410.00
      5    11175.30   52.65  0.30( 0.30) 1.00    8836.5   10400.00
      6    11106.67   54.48  0.30( 0.30) 1.00    9061.7   10200.00
      7    10750.34   59.84  0.30( 0.30) 1.00    9623.3   10300.00
      8    10729.27   60.05  0.30( 0.30) 1.00    9637.8   10320.00
      9    10286.67   64.78  0.30( 0.30) 1.00    9844.8   10210.00
     10     9881.37   88.83  0.30( 0.30) 1.00   10538.0   10100.00
    TOTAL AREA(ACRES) =    10538.0

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S7.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2543.24   40.04  0.30( 0.30) 1.00    1899.9   10710.00
      2     2346.69   45.98  0.30( 0.30) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =     1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10723.00 TO NODE  10724.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2543.24   40.04  0.30( 0.30) 1.00    1899.9   10710.00
```

```
      2     2346.69   45.98  0.30( 0.30) 0.99    1964.5   10700.00
    TOTAL AREA(ACRES) =      1964.5

****************************************************************************
  FLOW PROCESS FROM NODE  10640.00 TO NODE  10724.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2543.24   40.04    1.758  0.30( 0.30) 1.00    1899.9   10710.00
      2     2346.69   45.98    1.603  0.30( 0.30) 0.99    1964.5   10700.00
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10724.00 =   23207.33 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     9808.97   18.51    2.852  0.30( 0.30) 1.00    3239.7   10630.00
      2    10329.04   29.20    2.058  0.30( 0.30) 1.00    5112.8   10600.00
      3    10614.75   35.65    1.872  0.30( 0.30) 1.00    6255.9   10500.00
      4    10786.51   41.78    1.713  0.30( 0.30) 1.00    7261.5   10410.00
      5    11175.30   52.65    1.484  0.30( 0.30) 1.00    8836.5   10400.00
      6    11106.67   54.48    1.474  0.30( 0.30) 1.00    9061.7   10200.00
      7    10750.34   59.84    1.445  0.30( 0.30) 1.00    9623.3   10300.00
      8    10729.27   60.05    1.444  0.30( 0.30) 1.00    9637.8   10320.00
      9    10286.67   64.78    1.413  0.30( 0.30) 1.00    9844.8   10210.00
     10     9881.37   88.83    1.259  0.30( 0.30) 1.00   10538.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11866.07   18.51    2.852  0.30( 0.30) 1.00    4118.2   10630.00
      2    12564.84   29.20    2.058  0.30( 0.30) 1.00    6498.3   10600.00
      3    13055.59   35.65    1.872  0.30( 0.30) 1.00    7947.5   10500.00
      4    13281.02   40.04    1.758  0.30( 0.30) 1.00    8876.1   10710.00
      5    13272.22   41.78    1.713  0.30( 0.30) 1.00    9180.3   10410.00
      6    13283.44   45.98    1.603  0.30( 0.30) 1.00    9834.6   10700.00
      7    13307.51   52.65    1.484  0.30( 0.30) 1.00   10801.0   10400.00
      8    13221.06   54.48    1.474  0.30( 0.30) 1.00   11026.2   10200.00
      9    12812.72   59.84    1.445  0.30( 0.30) 1.00   11587.8   10300.00
     10    12789.53   60.05    1.444  0.30( 0.30) 1.00   11602.3   10320.00
     11    12292.18   64.78    1.413  0.30( 0.30) 1.00   11809.3   10210.00
     12    11608.58   88.83    1.259  0.30( 0.30) 1.00   12502.4   10100.00
    TOTAL AREA(ACRES) =     12502.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    13307.51  Tc(MIN.) =   52.650
  EFFECTIVE AREA(ACRES) =  10801.02  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12502.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10724.00 =   45335.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10724.00 TO NODE  10820.00 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1320.32  DOWNSTREAM(FEET) =   1289.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1341.06   CHANNEL SLOPE =  0.0231
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.476
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13332.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.00
  AVERAGE FLOW DEPTH(FEET) =  12.93   TRAVEL TIME(MIN.) =   1.49
  Tc(MIN.) =   54.14
  SUBAREA AREA(ACRES) =    47.66       SUBAREA RUNOFF(CFS) =   50.43
  EFFECTIVE AREA(ACRES) =  10848.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12550.1          PEAK FLOW RATE(CFS) =   13307.51
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.91   FLOW VELOCITY(FEET/SEC.) =  14.99
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10803.00 TO NODE  10820.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11866.07   20.05    2.654  0.30( 0.30) 1.00    4165.8   10630.00
      2    12564.84   30.71    2.000  0.30( 0.30) 1.00    6546.0   10600.00
      3    13055.59   37.15    1.833  0.30( 0.30) 1.00    7995.2   10500.00
      4    13281.02   41.53    1.719  0.30( 0.30) 1.00    8923.7   10710.00
      5    13272.22   43.27    1.674  0.30( 0.30) 1.00    9227.9   10410.00
      6    13283.44   47.47    1.564  0.30( 0.30) 1.00    9882.2   10700.00
      7    13307.51   54.14    1.476  0.30( 0.30) 1.00   10848.7   10400.00
      8    13221.06   55.98    1.466  0.30( 0.30) 1.00   11073.8   10200.00
      9    12812.72   61.34    1.435  0.30( 0.30) 1.00   11635.4   10300.00
     10    12789.53   61.55    1.434  0.30( 0.30) 1.00   11650.0   10320.00
     11    12292.18   66.30    1.403  0.30( 0.30) 1.00   11857.0   10210.00
     12    11608.58   90.38    1.249  0.30( 0.30) 1.00   12550.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
      1      298.45   14.06    3.508  0.30( 0.30) 1.00     103.4   10800.00
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10820.00 =    4081.86 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11639.81   14.06    3.508  0.30( 0.30) 1.00    3025.6   10800.00
      2    12085.10   20.05    2.654  0.30( 0.30) 1.00    4269.2   10630.00
      3    12722.97   30.71    2.000  0.30( 0.30) 1.00    6649.3   10600.00
      4    13198.20   37.15    1.833  0.30( 0.30) 1.00    8098.5   10500.00
      5    13413.04   41.53    1.719  0.30( 0.30) 1.00    9027.1   10710.00
      6    13400.02   43.27    1.674  0.30( 0.30) 1.00    9331.3   10410.00
      7    13401.04   47.47    1.564  0.30( 0.30) 1.00    9985.6   10700.00
      8    13416.89   54.14    1.476  0.30( 0.30) 1.00   10952.1   10400.00
      9    13329.52   55.98    1.466  0.30( 0.30) 1.00   11177.2   10200.00
     10    12918.35   61.34    1.435  0.30( 0.30) 1.00   11738.8   10300.00
     11    12895.04   61.55    1.434  0.30( 0.30) 1.00   11753.4   10320.00
     12    12394.85   66.30    1.403  0.30( 0.30) 1.00   11960.3   10210.00
     13    11696.90   90.38    1.249  0.30( 0.30) 1.00   12653.5   10100.00
    TOTAL AREA(ACRES) =     12653.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    13416.89  Tc(MIN.) =   54.140
  EFFECTIVE AREA(ACRES) =  10952.05  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12653.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10820.00 =   46676.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1289.38  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2450.84   CHANNEL SLOPE =  0.0332
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.94
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.463
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13493.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.20
  AVERAGE FLOW DEPTH(FEET) =  11.93   TRAVEL TIME(MIN.) =   2.38
  Tc(MIN.) =   56.52
  SUBAREA AREA(ACRES) =   147.19       SUBAREA RUNOFF(CFS) =  154.05
  EFFECTIVE AREA(ACRES) =  11099.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    12800.7         PEAK FLOW RATE(CFS) =   13416.89
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.90
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.90   FLOW VELOCITY(FEET/SEC.) =  17.17
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10820.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   56.52
  RAINFALL INTENSITY(INCH/HR) =   1.46
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   11099.24
  TOTAL STREAM AREA(ACRES) =   12800.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   13416.89

****************************************************************************
  FLOW PROCESS FROM NODE  10830.00 TO NODE  10831.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.89
  ELEVATION DATA: UPSTREAM(FEET) =   3249.56  DOWNSTREAM(FEET) =   3166.67

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.939
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.941
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        0.88      0.30     1.000     0    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.68
  TOTAL AREA(ACRES) =      0.88   PEAK FLOW RATE(CFS) =      3.68

****************************************************************************
  FLOW PROCESS FROM NODE  10831.00 TO NODE  10832.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3166.67  DOWNSTREAM(FEET) =   2954.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.65   CHANNEL SLOPE =  0.3126
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.20
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.050
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  USER-DEFINED               -       2.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.39
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.57
  Tc(MIN.) =   11.51
  SUBAREA AREA(ACRES) =     2.82       SUBAREA RUNOFF(CFS) =    9.52
  EFFECTIVE AREA(ACRES) =      3.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7         PEAK FLOW RATE(CFS) =      12.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   5.11
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10832.00 =     977.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10832.00 TO NODE  10833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2954.84  DOWNSTREAM(FEET) =   2765.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   951.35   CHANNEL SLOPE =  0.1995
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.69
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.607
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       29.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.61
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   2.08
  Tc(MIN.) =   13.60
  SUBAREA AREA(ACRES) =    29.25       SUBAREA RUNOFF(CFS) =   87.06
  EFFECTIVE AREA(ACRES) =     32.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      98.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   9.20
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10833.00 =    1928.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10833.00 TO NODE  10834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2765.08  DOWNSTREAM(FEET) =   2446.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.29   CHANNEL SLOPE =  0.1628
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.098
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     200.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.81
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   3.02
  Tc(MIN.) =   16.62
  SUBAREA AREA(ACRES) =    80.66       SUBAREA RUNOFF(CFS) =  203.16
  EFFECTIVE AREA(ACRES) =    113.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.6         PEAK FLOW RATE(CFS) =     286.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.75   FLOW VELOCITY(FEET/SEC.) =  12.10
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10834.00 =    3888.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10834.00 TO NODE  10835.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2446.09  DOWNSTREAM(FEET) =   1797.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2083.04   CHANNEL SLOPE =  0.3113
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.848
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      196.68      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     511.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.06
  AVERAGE FLOW DEPTH(FEET) =   2.02   TRAVEL TIME(MIN.) =   1.92
  Tc(MIN.) =   18.54
  SUBAREA AREA(ACRES) =   196.68       SUBAREA RUNOFF(CFS) =  451.07
  EFFECTIVE AREA(ACRES) =    310.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      310.3         PEAK FLOW RATE(CFS) =     711.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.42
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.42   FLOW VELOCITY(FEET/SEC.) =  19.86
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10835.00 =    5971.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1797.70  DOWNSTREAM(FEET) =   1208.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3213.25   CHANNEL SLOPE =  0.1835
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.536
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      218.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     932.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.75
  AVERAGE FLOW DEPTH(FEET) =   3.20   TRAVEL TIME(MIN.) =   3.02
  Tc(MIN.) =   21.56
  SUBAREA AREA(ACRES) =   218.82       SUBAREA RUNOFF(CFS) =  440.42
  EFFECTIVE AREA(ACRES) =    529.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      529.1         PEAK FLOW RATE(CFS) =    1064.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.43   FLOW VELOCITY(FEET/SEC.) =  18.41
  LONGEST FLOWPATH FROM NODE  10830.00 TO NODE  10840.00 =    9184.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10835.00 TO NODE  10840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.56
  RAINFALL INTENSITY(INCH/HR) =   2.54
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     529.11
  TOTAL STREAM AREA(ACRES) =     529.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1064.95

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    11639.81   16.52    3.111  0.30( 0.30) 1.00    3172.7   10800.00
      1    12085.10   22.49    2.464  0.30( 0.30) 1.00    4416.4   10630.00
      1    12722.97   33.12    1.937  0.30( 0.30) 1.00    6796.5   10600.00
      1    13198.20   39.53    1.771  0.30( 0.30) 1.00    8245.7   10500.00
      1    13413.04   43.91    1.657  0.30( 0.30) 1.00    9174.3   10710.00
      1    13400.02   45.65    1.612  0.30( 0.30) 1.00    9478.5   10410.00
      1    13401.04   49.85    1.502  0.30( 0.30) 1.00   10132.8   10700.00
      1    13416.89   56.52    1.463  0.30( 0.30) 1.00   11099.2   10400.00
      1    13329.52   58.36    1.453  0.30( 0.30) 1.00   11324.4   10200.00
      1    12918.35   63.74    1.420  0.30( 0.30) 1.00   11886.0   10300.00
      1    12895.04   63.95    1.419  0.30( 0.30) 1.00   11900.6   10320.00
      1    12394.85   68.73    1.388  0.30( 0.30) 1.00   12107.5   10210.00
      1    11696.90   92.84    1.239  0.30( 0.30) 1.00   12800.7   10100.00
      2     1064.95   21.56    2.536  0.30( 0.30) 1.00     529.1   10830.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12665.75   16.52    3.111  0.30( 0.30) 1.00    3578.3   10800.00
      2    13080.60   21.56    2.536  0.30( 0.30) 1.00    4751.6   10830.00
      3    13115.41   22.49    2.464  0.30( 0.30) 1.00    4945.5   10630.00
      4    13502.65   33.12    1.937  0.30( 0.30) 1.00    7325.6   10600.00
      5    13898.77   39.53    1.771  0.30( 0.30) 1.00    8774.8   10500.00
      6    14059.30   43.91    1.657  0.30( 0.30) 1.00    9703.4   10710.00
      7    14024.64   45.65    1.612  0.30( 0.30) 1.00   10007.6   10410.00
      8    13973.46   49.85    1.502  0.30( 0.30) 1.00   10661.9   10700.00
      9    13970.65   56.52    1.463  0.30( 0.30) 1.00   11628.4   10400.00
     10    13878.55   58.36    1.453  0.30( 0.30) 1.00   11853.5   10200.00
     11    13451.69   63.74    1.420  0.30( 0.30) 1.00   12415.1   10300.00
     12    13427.72   63.95    1.419  0.30( 0.30) 1.00   12429.7   10320.00
     13    12912.91   68.73    1.388  0.30( 0.30) 1.00   12636.6   10210.00
     14    12143.85   92.84    1.239  0.30( 0.30) 1.00   13329.8   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   14059.30    Tc(MIN.) =    43.91
  EFFECTIVE AREA(ACRES) =    9703.41   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    13329.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10840.00 =   49127.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10840.00 TO NODE  10841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1208.07  DOWNSTREAM(FEET) =   1119.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3050.12   CHANNEL SLOPE =  0.0292
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.577
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      222.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14187.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.62
  AVERAGE FLOW DEPTH(FEET) =  12.59   TRAVEL TIME(MIN.) =   3.06
  Tc(MIN.) =   46.96
  SUBAREA AREA(ACRES) =   222.84       SUBAREA RUNOFF(CFS) =  256.17
  EFFECTIVE AREA(ACRES) =   9926.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13552.6         PEAK FLOW RATE(CFS) =   14059.30
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.54   FLOW VELOCITY(FEET/SEC.) =  16.58
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10841.00 =   52177.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1119.03  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.14   CHANNEL SLOPE =  0.0238
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.540
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      265.26      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14207.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.42
  AVERAGE FLOW DEPTH(FEET) =  13.23   TRAVEL TIME(MIN.) =   1.43
  Tc(MIN.) =   48.39
  SUBAREA AREA(ACRES) =   265.26       SUBAREA RUNOFF(CFS) =  296.06
  EFFECTIVE AREA(ACRES) =  10191.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    13817.9         PEAK FLOW RATE(CFS) =   14059.30
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.16   FLOW VELOCITY(FEET/SEC.) =  15.37
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10841.00 TO NODE  10860.00 IS CODE =   1
```



```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   48.39
  RAINFALL INTENSITY(INCH/HR) =   1.54
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   10191.51
  TOTAL STREAM AREA(ACRES) =   13817.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   14059.30

****************************************************************************
  FLOW PROCESS FROM NODE  10850.00 TO NODE  10851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   311.88
  ELEVATION DATA: UPSTREAM(FEET) =   3029.66  DOWNSTREAM(FEET) =   2922.38

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.691
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.074
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.73      0.30     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.73
  TOTAL AREA(ACRES) =      2.73   PEAK FLOW RATE(CFS) =     11.73

****************************************************************************
  FLOW PROCESS FROM NODE  10851.00 TO NODE  10852.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2922.38  DOWNSTREAM(FEET) =   2684.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =   687.05   CHANNEL SLOPE =  0.3461
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.265
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.34
  AVERAGE FLOW DEPTH(FEET) =   0.31   TRAVEL TIME(MIN.) =   1.81
  Tc(MIN.) =   10.50
```

```
  SUBAREA AREA(ACRES) =     5.11       SUBAREA RUNOFF(CFS) =   18.24
  EFFECTIVE AREA(ACRES) =      7.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      27.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =   7.06
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10852.00 =     998.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10852.00 TO NODE  10853.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2684.61  DOWNSTREAM(FEET) =   2306.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.58   CHANNEL SLOPE =  0.1966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.09
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.563
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     117.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.71
  AVERAGE FLOW DEPTH(FEET) =   1.00   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   13.80
  SUBAREA AREA(ACRES) =    60.02       SUBAREA RUNOFF(CFS) =  176.29
  EFFECTIVE AREA(ACRES) =     67.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =     199.32
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =  11.51
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10853.00 =    2923.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10853.00 TO NODE  10854.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2306.25  DOWNSTREAM(FEET) =   1555.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3225.53   CHANNEL SLOPE =  0.2329
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.029
```



```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      235.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     490.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.06
  AVERAGE FLOW DEPTH(FEET) =   2.14   TRAVEL TIME(MIN.) =   3.35
  Tc(MIN.) =   17.15
  SUBAREA AREA(ACRES) =   235.82       SUBAREA RUNOFF(CFS) =  579.23
  EFFECTIVE AREA(ACRES) =    303.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.7         PEAK FLOW RATE(CFS) =     745.91
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.68   FLOW VELOCITY(FEET/SEC.) =  18.17
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10854.00 =    6149.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1555.12  DOWNSTREAM(FEET) =   1087.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3294.22   CHANNEL SLOPE =  0.1419
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.64
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.621
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      247.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1004.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.50
  AVERAGE FLOW DEPTH(FEET) =   3.56   TRAVEL TIME(MIN.) =   3.33
  Tc(MIN.) =   20.48
  SUBAREA AREA(ACRES) =   247.64       SUBAREA RUNOFF(CFS) =  517.24
  EFFECTIVE AREA(ACRES) =    551.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      551.3         PEAK FLOW RATE(CFS) =    1151.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.82   FLOW VELOCITY(FEET/SEC.) =  17.10
  LONGEST FLOWPATH FROM NODE  10850.00 TO NODE  10860.00 =    9443.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10854.00 TO NODE  10860.00 IS CODE =   1
```

```
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.48
  RAINFALL INTENSITY(INCH/HR) =   2.62
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     551.32
  TOTAL STREAM AREA(ACRES) =     551.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1151.52

  ** CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    12665.75   21.12    2.570  0.30( 0.30) 1.00    4066.4   10800.00
      1    13080.60   26.12    2.211  0.30( 0.30) 1.00    5239.7   10830.00
      1    13115.41   27.05    2.165  0.30( 0.30) 1.00    5433.6   10630.00
      1    13502.65   37.65    1.820  0.30( 0.30) 1.00    7813.7   10600.00
      1    13898.77   44.03    1.654  0.30( 0.30) 1.00    9262.9   10500.00
      1    14059.30   48.39    1.540  0.30( 0.30) 1.00   10191.5   10710.00
      1    14024.64   50.13    1.497  0.30( 0.30) 1.00   10495.7   10410.00
      1    13973.46   54.34    1.475  0.30( 0.30) 1.00   11150.0   10700.00
      1    13970.65   61.01    1.438  0.30( 0.30) 1.00   12116.5   10400.00
      1    13878.55   62.86    1.426  0.30( 0.30) 1.00   12341.6   10200.00
      1    13451.69   68.28    1.391  0.30( 0.30) 1.00   12903.2   10300.00
      1    13427.72   68.49    1.389  0.30( 0.30) 1.00   12917.8   10320.00
      1    12912.91   73.31    1.358  0.30( 0.30) 1.00   13124.7   10210.00
      1    12143.85   97.50    1.218  0.30( 0.30) 1.00   13817.9   10100.00
      2     1151.52   20.48    2.621  0.30( 0.30) 1.00     551.3   10850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13703.70   20.48    2.621  0.30( 0.30) 1.00    4494.1   10850.00
      2    13792.35   21.12    2.570  0.30( 0.30) 1.00    4617.7   10800.00
      3    14029.00   26.12    2.211  0.30( 0.30) 1.00    5791.0   10830.00
      4    14040.90   27.05    2.165  0.30( 0.30) 1.00    5984.9   10630.00
      5    14256.85   37.65    1.820  0.30( 0.30) 1.00    8365.0   10600.00
      6    14570.56   44.03    1.654  0.30( 0.30) 1.00    9814.3   10500.00
      7    14674.63   48.39    1.540  0.30( 0.30) 1.00   10742.8   10710.00
      8    14618.75   50.13    1.497  0.30( 0.30) 1.00   11047.0   10410.00
      9    14556.30   54.34    1.475  0.30( 0.30) 1.00   11701.3   10700.00
     10    14535.11   61.01    1.438  0.30( 0.30) 1.00   12667.8   10400.00
     11    14437.10   62.86    1.426  0.30( 0.30) 1.00   12892.9   10200.00
     12    13992.93   68.28    1.391  0.30( 0.30) 1.00   13454.5   10300.00
     13    13968.28   68.49    1.389  0.30( 0.30) 1.00   13469.1   10320.00
     14    13438.09   73.31    1.358  0.30( 0.30) 1.00   13676.1   10210.00
     15    12599.39   97.50    1.218  0.30( 0.30) 1.00   14369.2   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   14674.63    Tc(MIN.) =    48.39
```



```
  EFFECTIVE AREA(ACRES) =   10742.83   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    14369.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10860.00 =   53495.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1087.70  DOWNSTREAM(FEET) =    961.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4791.22   CHANNEL SLOPE =  0.0264
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.480
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      402.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14888.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.23
  AVERAGE FLOW DEPTH(FEET) =  13.19   TRAVEL TIME(MIN.) =   4.92
  Tc(MIN.) =   53.31
  SUBAREA AREA(ACRES) =   402.51       SUBAREA RUNOFF(CFS) =  427.54
  EFFECTIVE AREA(ACRES) =  11145.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    14771.7          PEAK FLOW RATE(CFS) =   14674.63
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.10   FLOW VELOCITY(FEET/SEC.) =  16.17
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    14771.7  TC(MIN.) =     53.31
  EFFECTIVE AREA(ACRES) =  11145.34  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =   14674.63

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    13703.70   25.47    2.243  0.30( 0.30) 1.00    4896.6   10850.00
      2    13792.35   26.11    2.212  0.30( 0.30) 1.00    5020.2   10800.00
      3    14029.00   31.09    1.990  0.30( 0.30) 1.00    6193.5   10830.00
      4    14040.90   32.02    1.966  0.30( 0.30) 1.00    6387.4   10630.00
      5    14256.85   42.60    1.691  0.30( 0.30) 1.00    8767.6   10600.00
      6    14570.56   48.96    1.525  0.30( 0.30) 1.00   10216.8   10500.00
      7    14674.63   53.31    1.480  0.30( 0.30) 1.00   11145.3   10710.00
      8    14618.75   55.06    1.471  0.30( 0.30) 1.00   11449.5   10410.00
      9    14556.30   59.27    1.448  0.30( 0.30) 1.00   12103.8   10700.00
```

10	14535.11	65.94	1.406	0.30(0.30)	1.00	13070.3	10400.00
11	14437.10	67.80	1.394	0.30(0.30)	1.00	13295.4	10200.00
12	13992.93	73.26	1.359	0.30(0.30)	1.00	13857.0	10300.00
13	13968.28	73.48	1.357	0.30(0.30)	1.00	13871.6	10320.00
14	13438.09	78.35	1.326	0.30(0.30)	1.00	14078.6	10210.00
15	12599.39	102.63	1.195	0.30(0.30)	1.00	14771.7	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S9.DAT
  TIME/DATE OF STUDY: 09:57 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  7.056
   2)   10.00;  4.371
   3)   15.00;  3.309
   4)   20.00;  2.658
   5)   25.00;  2.267
   6)   30.00;  2.018
   7)   40.00;  1.759
   8)   50.00;  1.498
   9)   60.00;  1.444
  10)   90.00;  1.251
  11)  120.00;  1.119
  12)  180.00;  0.957
  13)  360.00;  0.738
  14) 1440.00;  0.333
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  10900.00 TO NODE  10901.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   305.17
  ELEVATION DATA: UPSTREAM(FEET) =   3291.76  DOWNSTREAM(FEET) =   3104.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.671
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.622
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.19      0.30     1.000     0    7.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      5.70
  TOTAL AREA(ACRES) =      1.19   PEAK FLOW RATE(CFS) =      5.70

**************************************************************************
  FLOW PROCESS FROM NODE  10901.00 TO NODE  10902.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3104.08  DOWNSTREAM(FEET) =   2877.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   666.71   CHANNEL SLOPE =  0.3398
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.414
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        2.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.94
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =    9.92
  SUBAREA AREA(ACRES) =     2.53       SUBAREA RUNOFF(CFS) =    9.37
  EFFECTIVE AREA(ACRES) =      3.72     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        3.7          PEAK FLOW RATE(CFS) =      13.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   5.45
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10902.00 =     971.88 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  10902.00 TO NODE  10903.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2877.50  DOWNSTREAM(FEET) =   2643.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.39   CHANNEL SLOPE =  0.1219
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.392
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.81
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   4.69
  Tc(MIN.) =   14.61
  SUBAREA AREA(ACRES) =    36.43       SUBAREA RUNOFF(CFS) =  101.37
  EFFECTIVE AREA(ACRES) =     40.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.2         PEAK FLOW RATE(CFS) =     111.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.12   FLOW VELOCITY(FEET/SEC.) =   8.16
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10903.00 =    2888.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10903.00 TO NODE  10904.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2643.95  DOWNSTREAM(FEET) =   2373.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.90   CHANNEL SLOPE =  0.1400
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.85
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.986
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     268.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.23
  AVERAGE FLOW DEPTH(FEET) =   1.77   TRAVEL TIME(MIN.) =   2.87
  Tc(MIN.) =   17.48
  SUBAREA AREA(ACRES) =   129.07       SUBAREA RUNOFF(CFS) =  312.07
  EFFECTIVE AREA(ACRES) =    169.22     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      169.2         PEAK FLOW RATE(CFS) =     409.15
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.22   FLOW VELOCITY(FEET/SEC.) =  12.74
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10904.00 =    4820.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10904.00 TO NODE  10905.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2373.49  DOWNSTREAM(FEET) =   1817.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2764.66   CHANNEL SLOPE =  0.2010
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.625
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     532.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.64
  AVERAGE FLOW DEPTH(FEET) =   2.32   TRAVEL TIME(MIN.) =   2.95
  Tc(MIN.) =   20.42
  SUBAREA AREA(ACRES) =   117.70       SUBAREA RUNOFF(CFS) =  246.28
  EFFECTIVE AREA(ACRES) =    286.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.9         PEAK FLOW RATE(CFS) =     600.36
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.48   FLOW VELOCITY(FEET/SEC.) =  16.16
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10905.00 =    7584.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10905.00 TO NODE  10906.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1817.76  DOWNSTREAM(FEET) =   1387.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2799.36   CHANNEL SLOPE =  0.1536
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.44
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.406
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      363.93      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     945.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.68
  AVERAGE FLOW DEPTH(FEET) =   3.38   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   23.22
  SUBAREA AREA(ACRES) =   363.93       SUBAREA RUNOFF(CFS) =  689.83
  EFFECTIVE AREA(ACRES) =    650.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      650.8          PEAK FLOW RATE(CFS) =    1233.69
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.87   FLOW VELOCITY(FEET/SEC.) =  17.95
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10906.00 =   10384.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1387.73  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2484.63   CHANNEL SLOPE =  0.1103
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.30
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.227
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       56.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1283.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.08
  AVERAGE FLOW DEPTH(FEET) =   4.29   TRAVEL TIME(MIN.) =   2.57
  Tc(MIN.) =   25.80
  SUBAREA AREA(ACRES) =    56.85       SUBAREA RUNOFF(CFS) =   98.62
  EFFECTIVE AREA(ACRES) =    707.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      707.7          PEAK FLOW RATE(CFS) =    1233.69
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.21   FLOW VELOCITY(FEET/SEC.) =  15.92
  LONGEST FLOWPATH FROM NODE  10900.00 TO NODE  10920.00 =   12868.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10906.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
```



```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.80
  RAINFALL INTENSITY(INCH/HR) =   2.23
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     707.70
  TOTAL STREAM AREA(ACRES) =     707.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1233.69

****************************************************************************
  FLOW PROCESS FROM NODE  10910.00 TO NODE  10911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   287.29
  ELEVATION DATA: UPSTREAM(FEET) =   3119.43  DOWNSTREAM(FEET) =   3044.59

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.891
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.966
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.91      0.30     1.000     0    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.02
  TOTAL AREA(ACRES) =      1.91   PEAK FLOW RATE(CFS) =      8.02

****************************************************************************
  FLOW PROCESS FROM NODE  10911.00 TO NODE  10912.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3044.59  DOWNSTREAM(FEET) =   2980.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.50   CHANNEL SLOPE =  0.1015
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.39
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.031
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.86
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   2.71
  Tc(MIN.) =   11.60
  SUBAREA AREA(ACRES) =     4.16       SUBAREA RUNOFF(CFS) =   13.97
  EFFECTIVE AREA(ACRES) =      6.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =        6.1         PEAK FLOW RATE(CFS) =      20.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.44   FLOW VELOCITY(FEET/SEC.) =   4.28
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10912.00 =     914.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10912.00 TO NODE  10913.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2980.93  DOWNSTREAM(FEET) =   2876.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =   984.99   CHANNEL SLOPE =  0.1065
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.457
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.86      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.08
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   14.30
  SUBAREA AREA(ACRES) =    22.86       SUBAREA RUNOFF(CFS) =   64.95
  EFFECTIVE AREA(ACRES) =     28.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.9         PEAK FLOW RATE(CFS) =      82.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =   7.02
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10913.00 =    1899.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10913.00 TO NODE  10914.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2876.01  DOWNSTREAM(FEET) =   2832.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =   939.99   CHANNEL SLOPE =  0.0465
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.081
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       53.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     148.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.40
  AVERAGE FLOW DEPTH(FEET) =   1.73   TRAVEL TIME(MIN.) =   2.45
  Tc(MIN.) =   16.75
  SUBAREA AREA(ACRES) =    53.02       SUBAREA RUNOFF(CFS) =  132.70
  EFFECTIVE AREA(ACRES) =     81.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       81.9         PEAK FLOW RATE(CFS) =     205.11
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.06   FLOW VELOCITY(FEET/SEC.) =   7.04
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10914.00 =    2839.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10914.00 TO NODE  10915.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2832.29  DOWNSTREAM(FEET) =   2769.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1006.52   CHANNEL SLOPE =  0.0623
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.833
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.80      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     308.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.81
  AVERAGE FLOW DEPTH(FEET) =   2.38   TRAVEL TIME(MIN.) =   1.90
  Tc(MIN.) =   18.66
  SUBAREA AREA(ACRES) =    90.80       SUBAREA RUNOFF(CFS) =  206.99
  EFFECTIVE AREA(ACRES) =    172.75     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      172.8         PEAK FLOW RATE(CFS) =     393.81
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.71   FLOW VELOCITY(FEET/SEC.) =   9.44
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10915.00 =    3846.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10915.00 TO NODE  10916.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2769.58  DOWNSTREAM(FEET) =   2453.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3003.36   CHANNEL SLOPE =  0.1053
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.471
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      311.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     699.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.41
  AVERAGE FLOW DEPTH(FEET) =   3.19   TRAVEL TIME(MIN.) =   3.73
  Tc(MIN.) =   22.39
  SUBAREA AREA(ACRES) =   311.96       SUBAREA RUNOFF(CFS) =  609.57
  EFFECTIVE AREA(ACRES) =    484.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      484.7         PEAK FLOW RATE(CFS) =     947.12
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.73   FLOW VELOCITY(FEET/SEC.) =  14.57
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10916.00 =    6849.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10916.00 TO NODE  10917.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2453.21  DOWNSTREAM(FEET) =   1787.18
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2846.14   CHANNEL SLOPE =  0.2340
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.291
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1160.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.59
  AVERAGE FLOW DEPTH(FEET) =   3.37   TRAVEL TIME(MIN.) =   2.30
  Tc(MIN.) =   24.70
  SUBAREA AREA(ACRES) =   238.62       SUBAREA RUNOFF(CFS) =  427.56
  EFFECTIVE AREA(ACRES) =    723.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      723.3         PEAK FLOW RATE(CFS) =    1296.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.57
```



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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.57   FLOW VELOCITY(FEET/SEC.) =  21.20
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10917.00 =    9695.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10917.00 TO NODE  10918.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1787.18  DOWNSTREAM(FEET) =   1279.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2918.23   CHANNEL SLOPE =  0.1741
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.05
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.158
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      150.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1422.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.53
  AVERAGE FLOW DEPTH(FEET) =   4.03   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   27.19
  SUBAREA AREA(ACRES) =   150.63       SUBAREA RUNOFF(CFS) =  251.91
  EFFECTIVE AREA(ACRES) =    873.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      874.0         PEAK FLOW RATE(CFS) =    1461.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.09   FLOW VELOCITY(FEET/SEC.) =  19.68
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10918.00 =   12614.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1279.22  DOWNSTREAM(FEET) =   1113.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.50   CHANNEL SLOPE =  0.0995
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.073
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       60.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1509.61
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 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.18
 AVERAGE FLOW DEPTH(FEET) =   4.77   TRAVEL TIME(MIN.) =   1.71
 Tc(MIN.) =   28.90
 SUBAREA AREA(ACRES) =    60.16       SUBAREA RUNOFF(CFS) =   95.99
 EFFECTIVE AREA(ACRES) =    934.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      934.1         PEAK FLOW RATE(CFS) =    1490.45
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.74

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.74   FLOW VELOCITY(FEET/SEC.) =  16.13
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10918.00 TO NODE  10920.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   28.90
 RAINFALL INTENSITY(INCH/HR) =   2.07
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     934.12
 TOTAL STREAM AREA(ACRES) =     934.12
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    1490.45

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1233.69   25.80    2.227  0.30( 0.30) 1.00     707.7   10900.00
     2     1490.45   28.90    2.073  0.30( 0.30) 1.00     934.1   10910.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2680.07   25.80    2.227  0.30( 0.30) 1.00    1541.5   10900.00
     2     2625.22   28.90    2.073  0.30( 0.30) 1.00    1641.8   10910.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    2680.07    Tc(MIN.) =    25.80
 EFFECTIVE AREA(ACRES) =    1541.51   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1641.8
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10920.00 =   14278.52 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1113.60  DOWNSTREAM(FEET) =    961.06
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2282.16   CHANNEL SLOPE =  0.0668
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.112
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -      185.67      0.30      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2831.49
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.45
 AVERAGE FLOW DEPTH(FEET) =   7.11   TRAVEL TIME(MIN.) =   2.31
 Tc(MIN.) =   28.11
 SUBAREA AREA(ACRES) =   185.67       SUBAREA RUNOFF(CFS) =  302.83
 EFFECTIVE AREA(ACRES) =   1727.18     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1827.5         PEAK FLOW RATE(CFS) =    2817.08
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.09

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.09   FLOW VELOCITY(FEET/SEC.) =  16.43
 LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10921.00 =   16560.68 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1827.5  TC(MIN.) =     28.11
 EFFECTIVE AREA(ACRES) =   1727.18  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =    2817.08

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2817.08   28.11    2.112  0.30( 0.30) 1.00    1727.2   10900.00
     2     2773.57   31.23    1.986  0.30( 0.30) 1.00    1827.5   10910.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S10.DAT
  TIME/DATE OF STUDY: 09:57 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.868
   2)   10.00;  4.278
   3)   15.00;  3.249
   4)   20.00;  2.620
   5)   25.00;  2.240
   6)   30.00;  1.995
   7)   40.00;  1.736
   8)   50.00;  1.482
   9)   60.00;  1.420
  10)   90.00;  1.225
  11)  120.00;  1.092
  12)  180.00;  0.931
  13)  360.00;  0.714
  14) 1440.00;  0.320
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11000.00 TO NODE  11001.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   362.38
  ELEVATION DATA: UPSTREAM(FEET) =   2528.19  DOWNSTREAM(FEET) =   2375.55

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.863
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.867
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        2.03      0.30     1.000      0    8.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.34
  TOTAL AREA(ACRES) =      2.03   PEAK FLOW RATE(CFS) =      8.34

****************************************************************************
  FLOW PROCESS FROM NODE  11001.00 TO NODE  11002.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2375.55  DOWNSTREAM(FEET) =   2005.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.45   CHANNEL SLOPE =  0.6438
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.214
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        3.14      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.63
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   1.45
  Tc(MIN.) =   10.31
  SUBAREA AREA(ACRES) =     3.14       SUBAREA RUNOFF(CFS) =   11.06
  EFFECTIVE AREA(ACRES) =      5.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        5.2          PEAK FLOW RATE(CFS) =      18.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   7.26
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11002.00 =     937.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11002.00 TO NODE  11003.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2005.09  DOWNSTREAM(FEET) =   1450.44
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.43   CHANNEL SLOPE =  0.5763
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.43
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.883
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.94
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   1.61
  Tc(MIN.) =   11.92
  SUBAREA AREA(ACRES) =    16.53       SUBAREA RUNOFF(CFS) =   53.30
  EFFECTIVE AREA(ACRES) =     21.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.7         PEAK FLOW RATE(CFS) =      69.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =  11.59
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11003.00 =    1900.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.44  DOWNSTREAM(FEET) =    939.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1351.71   CHANNEL SLOPE =  0.3779
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.496
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.99      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     114.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.99
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   1.88
  Tc(MIN.) =   13.80
  SUBAREA AREA(ACRES) =    30.99       SUBAREA RUNOFF(CFS) =   89.14
  EFFECTIVE AREA(ACRES) =     52.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       52.7         PEAK FLOW RATE(CFS) =     151.55
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =  13.18
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S8.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    13703.70   25.47  0.30( 0.30) 1.00    4896.6   10850.00
      2    13792.35   26.11  0.30( 0.30) 1.00    5020.2   10800.00
      3    14029.00   31.09  0.30( 0.30) 1.00    6193.5   10830.00
      4    14040.90   32.02  0.30( 0.30) 1.00    6387.4   10630.00
      5    14256.85   42.60  0.30( 0.30) 1.00    8767.6   10600.00
      6    14570.56   48.96  0.30( 0.30) 1.00   10216.8   10500.00
      7    14674.63   53.31  0.30( 0.30) 1.00   11145.3   10710.00
      8    14618.75   55.06  0.30( 0.30) 1.00   11449.5   10410.00
      9    14556.30   59.27  0.30( 0.30) 1.00   12103.8   10700.00
     10    14535.11   65.94  0.30( 0.30) 1.00   13070.3   10400.00
     11    14437.10   67.80  0.30( 0.30) 1.00   13295.4   10200.00
     12    13992.93   73.26  0.30( 0.30) 1.00   13857.0   10300.00
     13    13968.28   73.48  0.30( 0.30) 1.00   13871.6   10320.00
     14    13438.09   78.35  0.30( 0.30) 1.00   14078.6   10210.00
     15    12599.39  102.63  0.30( 0.30) 1.00   14771.7   10100.00
    TOTAL AREA(ACRES) =    14771.7

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S9.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2817.08   28.11  0.30( 0.30) 1.00    1727.2   10900.00
      2     2773.57   31.23  0.30( 0.30) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =     1827.5

****************************************************************************
  FLOW PROCESS FROM NODE  10920.00 TO NODE  10921.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     2817.08   28.11  0.30( 0.30) 1.00    1727.2   10900.00
     2     2773.57   31.23  0.30( 0.30) 1.00    1827.5   10910.00
    TOTAL AREA(ACRES) =      1827.5

****************************************************************************
  FLOW PROCESS FROM NODE  10860.00 TO NODE  10921.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2817.08   28.11    2.088  0.30( 0.30) 1.00    1727.2   10900.00
     2     2773.57   31.23    1.963  0.30( 0.30) 1.00    1827.5   10910.00
  LONGEST FLOWPATH FROM NODE  10910.00 TO NODE  10921.00 =   16560.68 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    13703.70   25.47    2.217  0.30( 0.30) 1.00    4896.6   10850.00
     2    13792.35   26.11    2.186  0.30( 0.30) 1.00    5020.2   10800.00
     3    14029.00   31.09    1.967  0.30( 0.30) 1.00    6193.5   10830.00
     4    14040.90   32.02    1.943  0.30( 0.30) 1.00    6387.4   10630.00
     5    14256.85   42.60    1.670  0.30( 0.30) 1.00    8767.6   10600.00
     6    14570.56   48.96    1.508  0.30( 0.30) 1.00   10216.8   10500.00
     7    14674.63   53.31    1.461  0.30( 0.30) 1.00   11145.3   10710.00
     8    14618.75   55.06    1.451  0.30( 0.30) 1.00   11449.5   10410.00
     9    14556.30   59.27    1.425  0.30( 0.30) 1.00   12103.8   10700.00
    10    14535.11   65.94    1.381  0.30( 0.30) 1.00   13070.3   10400.00
    11    14437.10   67.80    1.369  0.30( 0.30) 1.00   13295.4   10200.00
    12    13992.93   73.26    1.334  0.30( 0.30) 1.00   13857.0   10300.00
    13    13968.28   73.48    1.332  0.30( 0.30) 1.00   13871.6   10320.00
    14    13438.09   78.35    1.301  0.30( 0.30) 1.00   14078.6   10210.00
    15    12599.39  102.63    1.169  0.30( 0.30) 1.00   14771.7   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    16441.06   25.47    2.217  0.30( 0.30) 1.00    6461.8   10850.00
     2    16552.44   26.11    2.186  0.30( 0.30) 1.00    6624.5   10800.00
     3    16704.45   28.11    2.088  0.30( 0.30) 1.00    7218.5   10900.00
     4    16804.47   31.09    1.967  0.30( 0.30) 1.00    8016.6   10830.00
     5    16804.32   31.23    1.963  0.30( 0.30) 1.00    8049.4   10910.00
     6    16780.37   32.02    1.943  0.30( 0.30) 1.00    8214.9   10630.00
     7    16541.29   42.60    1.670  0.30( 0.30) 1.00   10595.0   10600.00
     8    16585.78   48.96    1.508  0.30( 0.30) 1.00   12044.3   10500.00
     9    16611.49   53.31    1.461  0.30( 0.30) 1.00   12972.8   10710.00
    10    16537.53   55.06    1.451  0.30( 0.30) 1.00   13277.0   10410.00
    11    16431.56   59.27    1.425  0.30( 0.30) 1.00   13931.3   10700.00
    12    16338.42   65.94    1.381  0.30( 0.30) 1.00   14897.8   10400.00
    13    16220.26   67.80    1.369  0.30( 0.30) 1.00   15122.9   10200.00
    14    15716.86   73.26    1.334  0.30( 0.30) 1.00   15684.5   10300.00
```



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    15    15689.87   73.48    1.332  0.30( 0.30) 1.00   15699.1   10320.00
    16    15106.91   78.35    1.301  0.30( 0.30) 1.00   15906.1   10210.00
    17    14048.59  102.63    1.169  0.30( 0.30) 1.00   16599.2   10100.00
   TOTAL AREA(ACRES) =     16599.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    16804.47  Tc(MIN.) =   31.090
  EFFECTIVE AREA(ACRES) =   8016.62  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    16599.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10921.00 =   58287.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10921.00 TO NODE  11020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    961.06  DOWNSTREAM(FEET) =    939.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =   601.65   CHANNEL SLOPE =  0.0356
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.94
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.955
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.29      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   16818.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.39
  AVERAGE FLOW DEPTH(FEET) =  11.94   TRAVEL TIME(MIN.) =   0.47
  Tc(MIN.) =   31.56
  SUBAREA AREA(ACRES) =    18.29       SUBAREA RUNOFF(CFS) =   27.24
  EFFECTIVE AREA(ACRES) =   8034.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    16617.5         PEAK FLOW RATE(CFS) =   16804.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.94   FLOW VELOCITY(FEET/SEC.) =  21.39
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11003.00 TO NODE  11020.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    16441.06   25.94    2.194  0.30( 0.30) 1.00    6480.1   10850.00
     2    16552.44   26.58    2.163  0.30( 0.30) 1.00    6642.8   10800.00
```

```
      3    16704.45   28.58    2.065  0.30( 0.30) 1.00    7236.8   10900.00
      4    16804.47   31.56    1.955  0.30( 0.30) 1.00    8034.9   10830.00
      5    16804.32   31.69    1.951  0.30( 0.30) 1.00    8067.7   10910.00
      6    16780.37   32.48    1.931  0.30( 0.30) 1.00    8233.2   10630.00
      7    16541.29   43.07    1.658  0.30( 0.30) 1.00   10613.3   10600.00
      8    16585.78   49.43    1.497  0.30( 0.30) 1.00   12062.5   10500.00
      9    16611.49   53.78    1.459  0.30( 0.30) 1.00   12991.1   10710.00
     10    16537.53   55.53    1.448  0.30( 0.30) 1.00   13295.3   10410.00
     11    16431.56   59.74    1.422  0.30( 0.30) 1.00   13949.6   10700.00
     12    16338.42   66.41    1.378  0.30( 0.30) 1.00   14916.1   10400.00
     13    16220.26   68.27    1.366  0.30( 0.30) 1.00   15141.2   10200.00
     14    15716.86   73.74    1.331  0.30( 0.30) 1.00   15702.8   10300.00
     15    15689.87   73.96    1.329  0.30( 0.30) 1.00   15717.4   10320.00
     16    15106.91   78.83    1.298  0.30( 0.30) 1.00   15924.3   10210.00
     17    14048.59  103.12    1.167  0.30( 0.30) 1.00   16617.5   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      151.55   13.80    3.496  0.30( 0.30) 1.00      52.7   11000.00
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11020.00 =    3251.97 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14909.43   13.80    3.496  0.30( 0.30) 1.00    3499.6   11000.00
      2    16530.86   25.94    2.194  0.30( 0.30) 1.00    6532.8   10850.00
      3    16640.77   26.58    2.163  0.30( 0.30) 1.00    6695.5   10800.00
      4    16788.13   28.58    2.065  0.30( 0.30) 1.00    7289.5   10900.00
      5    16882.93   31.56    1.955  0.30( 0.30) 1.00    8087.6   10830.00
      6    16882.62   31.69    1.951  0.30( 0.30) 1.00    8120.4   10910.00
      7    16857.70   32.48    1.931  0.30( 0.30) 1.00    8285.9   10630.00
      8    16605.70   43.07    1.658  0.30( 0.30) 1.00   10666.0   10600.00
      9    16642.52   49.43    1.497  0.30( 0.30) 1.00   12115.2   10500.00
     10    16666.43   53.78    1.459  0.30( 0.30) 1.00   13043.8   10710.00
     11    16591.96   55.53    1.448  0.30( 0.30) 1.00   13348.0   10410.00
     12    16484.75   59.74    1.422  0.30( 0.30) 1.00   14002.3   10700.00
     13    16389.56   66.41    1.378  0.30( 0.30) 1.00   14968.8   10400.00
     14    16270.82   68.27    1.366  0.30( 0.30) 1.00   15193.9   10200.00
     15    15765.74   73.74    1.331  0.30( 0.30) 1.00   15755.5   10300.00
     16    15738.68   73.96    1.329  0.30( 0.30) 1.00   15770.1   10320.00
     17    15154.22   78.83    1.298  0.30( 0.30) 1.00   15977.0   10210.00
     18    14089.70  103.12    1.167  0.30( 0.30) 1.00   16670.2   10100.00
    TOTAL AREA(ACRES) =     16670.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    16882.93  Tc(MIN.) =   31.559
  EFFECTIVE AREA(ACRES) =   8087.60  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    16670.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11020.00 =   58888.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11020.00 TO NODE  11021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.63  DOWNSTREAM(FEET) =    865.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2876.19   CHANNEL SLOPE =  0.0259
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.98
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.890
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      191.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   17019.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.07
  AVERAGE FLOW DEPTH(FEET) =  12.96   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   34.07
  SUBAREA AREA(ACRES) =   191.02       SUBAREA RUNOFF(CFS) =  273.28
  EFFECTIVE AREA(ACRES) =   8278.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    16861.2         PEAK FLOW RATE(CFS) =   16882.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.91   FLOW VELOCITY(FEET/SEC.) =  19.04
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11021.00 =   61764.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11021.00 TO NODE  11022.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    865.22  DOWNSTREAM(FEET) =    752.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2892.47   CHANNEL SLOPE =  0.0389
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.82
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.833
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      320.06      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   17103.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  22.21
  AVERAGE FLOW DEPTH(FEET) =  11.78   TRAVEL TIME(MIN.) =   2.17
  Tc(MIN.) =   36.24
  SUBAREA AREA(ACRES) =   320.06       SUBAREA RUNOFF(CFS) =  441.70
  EFFECTIVE AREA(ACRES) =   8598.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17181.2         PEAK FLOW RATE(CFS) =   16882.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
```

```
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.71   FLOW VELOCITY(FEET/SEC.) =  22.12
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11022.00 =   64657.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11022.00 TO NODE  11023.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    752.60  DOWNSTREAM(FEET) =    737.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.15   CHANNEL SLOPE =  0.0081
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  17.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.768
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      226.98      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   17033.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.41
  AVERAGE FLOW DEPTH(FEET) =  16.96   TRAVEL TIME(MIN.) =   2.50
  Tc(MIN.) =   38.75
  SUBAREA AREA(ACRES) =   226.98       SUBAREA RUNOFF(CFS) =  300.86
  EFFECTIVE AREA(ACRES) =   8825.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17408.2         PEAK FLOW RATE(CFS) =   16882.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 16.90   FLOW VELOCITY(FEET/SEC.) =  12.38
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11023.00 =   66521.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    737.50  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2632.50   CHANNEL SLOPE =  0.0222
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.706
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      124.84      0.30     0.992     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   16962.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.03
  AVERAGE FLOW DEPTH(FEET) =  13.40   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   41.18
  SUBAREA AREA(ACRES) =   124.84       SUBAREA RUNOFF(CFS) =  158.25
  EFFECTIVE AREA(ACRES) =   8950.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    17533.1         PEAK FLOW RATE(CFS) =   16882.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.37   FLOW VELOCITY(FEET/SEC.) =  18.01
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11363.00 =   69154.02 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    17533.1  TC(MIN.) =     41.18
  EFFECTIVE AREA(ACRES) =   8950.50  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.999
  PEAK FLOW RATE(CFS)   =   16882.93

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    14909.43   23.72    2.337  0.30( 0.30) 1.00    4362.5   11000.00
      2    16530.86   35.62    1.850  0.30( 0.30) 1.00    7395.7   10850.00
      3    16640.77   36.23    1.834  0.30( 0.30) 1.00    7558.4   10800.00
      4    16788.13   38.21    1.782  0.30( 0.30) 1.00    8152.4   10900.00
      5    16882.93   41.18    1.706  0.30( 0.30) 1.00    8950.5   10830.00
      6    16882.62   41.32    1.703  0.30( 0.30) 1.00    8983.3   10910.00
      7    16857.70   42.11    1.682  0.30( 0.30) 1.00    9148.8   10630.00
      8    16605.70   52.74    1.465  0.30( 0.30) 1.00   11528.9   10600.00
      9    16642.52   59.09    1.426  0.30( 0.30) 1.00   12978.1   10500.00
     10    16666.43   63.44    1.398  0.30( 0.30) 1.00   13906.7   10710.00
     11    16591.96   65.20    1.386  0.30( 0.30) 1.00   14210.9   10410.00
     12    16484.75   69.43    1.359  0.30( 0.30) 1.00   14865.2   10700.00
     13    16389.56   76.12    1.315  0.30( 0.30) 1.00   15831.7   10400.00
     14    16270.82   77.99    1.303  0.30( 0.30) 1.00   16056.8   10200.00
     15    15765.74   83.54    1.267  0.30( 0.30) 1.00   16618.4   10300.00
     16    15738.68   83.76    1.266  0.30( 0.30) 1.00   16633.0   10320.00
     17    15154.22   88.73    1.233  0.30( 0.30) 1.00   16839.9   10210.00
     18    14089.70  113.21    1.122  0.30( 0.30) 1.00   17533.1   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S11.DAT
  TIME/DATE OF STUDY: 09:58 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.868
   2)   10.00;  4.278
   3)   15.00;  3.249
   4)   20.00;  2.620
   5)   25.00;  2.240
   6)   30.00;  1.995
   7)   40.00;  1.736
   8)   50.00;  1.482
   9)   60.00;  1.420
  10)   90.00;  1.225
  11)  120.00;  1.092
  12)  180.00;  0.931
  13)  360.00;  0.714
  14) 1440.00;  0.320
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11101.00 TO NODE  11102.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   920.30
  ELEVATION DATA: UPSTREAM(FEET) =   4391.58  DOWNSTREAM(FEET) =   4080.28

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.444
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.569
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.68      0.30     1.000     0   13.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.89
  TOTAL AREA(ACRES) =      2.68   PEAK FLOW RATE(CFS) =      7.89

**************************************************************************
  FLOW PROCESS FROM NODE  11102.00 TO NODE  11103.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4080.28  DOWNSTREAM(FEET) =   3876.52
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.85   CHANNEL SLOPE =  0.2123
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.192
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.95
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   2.01
  Tc(MIN.) =   15.46
  SUBAREA AREA(ACRES) =    39.96       SUBAREA RUNOFF(CFS) =  104.00
  EFFECTIVE AREA(ACRES) =     42.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       42.6          PEAK FLOW RATE(CFS) =     110.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   9.81
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11103.00 =    1880.15 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11103.00 TO NODE  11104.00 IS CODE =  56
```

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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3876.52  DOWNSTREAM(FEET) =   3625.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1902.80   CHANNEL SLOPE =  0.1317
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.57
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.792
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     196.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.99
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   3.17
  Tc(MIN.) =   18.63
  SUBAREA AREA(ACRES) =    75.64       SUBAREA RUNOFF(CFS) =  169.67
  EFFECTIVE AREA(ACRES) =    118.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.3         PEAK FLOW RATE(CFS) =     265.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.78   FLOW VELOCITY(FEET/SEC.) =  10.97
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11104.00 =    3782.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11104.00 TO NODE  11105.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3625.86  DOWNSTREAM(FEET) =   3222.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2898.91   CHANNEL SLOPE =  0.1391
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.35
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.439
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      167.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     427.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.88
  AVERAGE FLOW DEPTH(FEET) =   2.28   TRAVEL TIME(MIN.) =   3.75
  Tc(MIN.) =   22.38
  SUBAREA AREA(ACRES) =   167.73       SUBAREA RUNOFF(CFS) =  322.90
  EFFECTIVE AREA(ACRES) =    286.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      286.0         PEAK FLOW RATE(CFS) =     550.60
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.61   FLOW VELOCITY(FEET/SEC.) =  13.85
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11105.00 =    6681.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3222.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2480.35   CHANNEL SLOPE =  0.1089
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.223
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      252.33      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     769.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.91
  AVERAGE FLOW DEPTH(FEET) =   3.32   TRAVEL TIME(MIN.) =   2.97
  Tc(MIN.) =   25.35
  SUBAREA AREA(ACRES) =   252.33       SUBAREA RUNOFF(CFS) =  436.64
  EFFECTIVE AREA(ACRES) =    538.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      538.3         PEAK FLOW RATE(CFS) =     931.57
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.66   FLOW VELOCITY(FEET/SEC.) =  14.67
  LONGEST FLOWPATH FROM NODE  11101.00 TO NODE  11121.00 =    9162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11105.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.35
  RAINFALL INTENSITY(INCH/HR) =   2.22
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     538.34
  TOTAL STREAM AREA(ACRES) =     538.34
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     931.57
```

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****************************************************************************
  FLOW PROCESS FROM NODE  11111.00 TO NODE  11112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   329.73
  ELEVATION DATA: UPSTREAM(FEET) =   4094.14  DOWNSTREAM(FEET) =   3956.68

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.552
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.028
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.49      0.30     1.000     0    8.55
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.34
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      6.34

****************************************************************************
  FLOW PROCESS FROM NODE  11112.00 TO NODE  11113.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3956.68  DOWNSTREAM(FEET) =   3752.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.35   CHANNEL SLOPE =  0.3066
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.219
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        9.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.39
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   1.73
  Tc(MIN.) =   10.29
  SUBAREA AREA(ACRES) =     9.55       SUBAREA RUNOFF(CFS) =   33.69
  EFFECTIVE AREA(ACRES) =     11.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       11.0         PEAK FLOW RATE(CFS) =      38.94
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   7.71
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11113.00 =     995.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11113.00 TO NODE  11114.00 IS CODE =  56
```



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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3752.68  DOWNSTREAM(FEET) =   3541.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   955.83   CHANNEL SLOPE =  0.2209
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.851
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       26.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      80.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.91
  AVERAGE FLOW DEPTH(FEET) =   0.78   TRAVEL TIME(MIN.) =   1.79
  Tc(MIN.) =   12.07
  SUBAREA AREA(ACRES) =    26.09       SUBAREA RUNOFF(CFS) =   83.39
  EFFECTIVE AREA(ACRES) =     37.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.1         PEAK FLOW RATE(CFS) =     118.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.98   FLOW VELOCITY(FEET/SEC.) =  10.13
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11114.00 =    1950.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11114.00 TO NODE  11115.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3541.57  DOWNSTREAM(FEET) =   3320.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1889.90   CHANNEL SLOPE =  0.1172
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.198
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       51.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     185.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.46
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   3.33
  Tc(MIN.) =   15.40
  SUBAREA AREA(ACRES) =    51.13       SUBAREA RUNOFF(CFS) =  133.36
  EFFECTIVE AREA(ACRES) =     88.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       88.3         PEAK FLOW RATE(CFS) =     230.21
```

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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.70   FLOW VELOCITY(FEET/SEC.) =  10.07
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11115.00 =    3840.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11115.00 TO NODE  11116.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3320.00  DOWNSTREAM(FEET) =   3162.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.45   CHANNEL SLOPE =  0.0837
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.836
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     451.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.92
  AVERAGE FLOW DEPTH(FEET) =   2.69   TRAVEL TIME(MIN.) =   2.88
  Tc(MIN.) =   18.28
  SUBAREA AREA(ACRES) =   193.52       SUBAREA RUNOFF(CFS) =  441.75
  EFFECTIVE AREA(ACRES) =    281.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.8         PEAK FLOW RATE(CFS) =     643.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.24   FLOW VELOCITY(FEET/SEC.) =  12.05
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11116.00 =    5724.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11116.00 TO NODE  11117.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3162.36  DOWNSTREAM(FEET) =   3062.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.90   CHANNEL SLOPE =  0.0524
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.523
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.47      0.30     1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     755.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.61
  AVERAGE FLOW DEPTH(FEET) =   3.97   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   21.27
  SUBAREA AREA(ACRES) =   112.47       SUBAREA RUNOFF(CFS) =  225.07
  EFFECTIVE AREA(ACRES) =    394.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      394.2         PEAK FLOW RATE(CFS) =     788.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.05   FLOW VELOCITY(FEET/SEC.) =  10.75
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11117.00 =    7628.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3062.66  DOWNSTREAM(FEET) =   2952.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1878.40   CHANNEL SLOPE =  0.0587
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.314
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     835.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.38
  AVERAGE FLOW DEPTH(FEET) =   4.06   TRAVEL TIME(MIN.) =   2.75
  Tc(MIN.) =   24.02
  SUBAREA AREA(ACRES) =    51.63       SUBAREA RUNOFF(CFS) =   93.60
  EFFECTIVE AREA(ACRES) =    445.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      445.9         PEAK FLOW RATE(CFS) =     808.34
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.99   FLOW VELOCITY(FEET/SEC.) =  11.28
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11117.00 TO NODE  11121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   24.02
 RAINFALL INTENSITY(INCH/HR) =   2.31
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     445.88
 TOTAL STREAM AREA(ACRES) =     445.88
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     808.34

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      931.57   25.35    2.223  0.30( 0.30) 1.00     538.3   11101.00
     2      808.34   24.02    2.314  0.30( 0.30) 1.00     445.9   11111.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1733.06   24.02    2.314  0.30( 0.30) 1.00     956.0   11111.00
     2     1703.14   25.35    2.223  0.30( 0.30) 1.00     984.2   11101.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1733.06    Tc(MIN.) =    24.02
 EFFECTIVE AREA(ACRES) =     955.95   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =      984.2
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11121.00 =    9506.56 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11121.00 TO NODE  11122.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2952.48  DOWNSTREAM(FEET) =   2639.37
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2687.92   CHANNEL SLOPE =  0.1165
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.13
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.167
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      170.98      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1876.72
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.14
 AVERAGE FLOW DEPTH(FEET) =   5.11   TRAVEL TIME(MIN.) =   2.47
 Tc(MIN.) =   26.49
 SUBAREA AREA(ACRES) =   170.98       SUBAREA RUNOFF(CFS) =  287.29
 EFFECTIVE AREA(ACRES) =   1126.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1155.2         PEAK FLOW RATE(CFS) =    1893.52
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.14

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.14   FLOW VELOCITY(FEET/SEC.) =  18.18
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11122.00 =   12194.48 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2639.37  DOWNSTREAM(FEET) =   1954.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3696.53   CHANNEL SLOPE =  0.1854
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.029
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      114.61      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1982.69
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  21.83
 AVERAGE FLOW DEPTH(FEET) =   4.69   TRAVEL TIME(MIN.) =   2.82
 Tc(MIN.) =   29.31
 SUBAREA AREA(ACRES) =   114.61       SUBAREA RUNOFF(CFS) =  178.31
 EFFECTIVE AREA(ACRES) =   1241.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1269.8         PEAK FLOW RATE(CFS) =    1931.59
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.63

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.63   FLOW VELOCITY(FEET/SEC.) =  21.69
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11122.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   29.31
 RAINFALL INTENSITY(INCH/HR) =   2.03
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    1241.54
 TOTAL STREAM AREA(ACRES) =    1269.81
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    1931.59
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11130.00 TO NODE  11131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   259.85
  ELEVATION DATA: UPSTREAM(FEET) =   3923.93  DOWNSTREAM(FEET) =   3765.35

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.204
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.726
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        1.27      0.30     1.000     0    7.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.20
  TOTAL AREA(ACRES) =      1.27   PEAK FLOW RATE(CFS) =      6.20

****************************************************************************
  FLOW PROCESS FROM NODE  11131.00 TO NODE  11132.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3765.35  DOWNSTREAM(FEET) =   3414.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   674.05   CHANNEL SLOPE =  0.5200
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.909
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.12
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   1.58
  Tc(MIN.) =    8.78
  SUBAREA AREA(ACRES) =     6.52       SUBAREA RUNOFF(CFS) =   27.04
  EFFECTIVE AREA(ACRES) =      7.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      32.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   8.48
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11132.00 =     933.90 FEET.

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  11132.00 TO NODE  11133.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3414.86  DOWNSTREAM(FEET) =   2699.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1813.44   CHANNEL SLOPE =  0.3945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.996
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     102.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.69
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   2.59
  Tc(MIN.) =   11.37
  SUBAREA AREA(ACRES) =    41.63       SUBAREA RUNOFF(CFS) =  138.50
  EFFECTIVE AREA(ACRES) =     49.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       49.4         PEAK FLOW RATE(CFS) =     164.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =  13.76
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11133.00 =    2747.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11133.00 TO NODE  11134.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2699.51  DOWNSTREAM(FEET) =   2464.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1053.33   CHANNEL SLOPE =  0.2235
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.94
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.752
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      142.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     386.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.77
  AVERAGE FLOW DEPTH(FEET) =   1.90   TRAVEL TIME(MIN.) =   1.19
  Tc(MIN.) =   12.56
  SUBAREA AREA(ACRES) =   142.85       SUBAREA RUNOFF(CFS) =  443.80
  EFFECTIVE AREA(ACRES) =    192.27     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =      192.3         PEAK FLOW RATE(CFS) =     597.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.41   FLOW VELOCITY(FEET/SEC.) =  16.76
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11134.00 =    3800.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.06  DOWNSTREAM(FEET) =   1954.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1291.98   CHANNEL SLOPE =  0.3946
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.540
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       24.58      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     633.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.90
  AVERAGE FLOW DEPTH(FEET) =   2.13   TRAVEL TIME(MIN.) =   1.03
  Tc(MIN.) =   13.59
  SUBAREA AREA(ACRES) =    24.58       SUBAREA RUNOFF(CFS) =   71.67
  EFFECTIVE AREA(ACRES) =    216.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      216.9         PEAK FLOW RATE(CFS) =     632.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.13   FLOW VELOCITY(FEET/SEC.) =  20.87
  LONGEST FLOWPATH FROM NODE  11130.00 TO NODE  11141.00 =    5092.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11134.00 TO NODE  11141.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.59
  RAINFALL INTENSITY(INCH/HR) =   3.54
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     216.85
  TOTAL STREAM AREA(ACRES) =     216.85
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     632.31

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1931.59   29.31    2.029  0.30( 0.30) 1.00    1241.5   11111.00
      1     1917.57   30.66    1.978  0.30( 0.30) 1.00    1269.8   11101.00
      2      632.31   13.59    3.540  0.30( 0.30) 1.00     216.9   11130.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2310.24   13.59    3.540  0.30( 0.30) 1.00     792.3   11130.00
      2     2268.97   29.31    2.029  0.30( 0.30) 1.00    1458.4   11111.00
      3     2245.04   30.66    1.978  0.30( 0.30) 1.00    1486.7   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    2310.24    Tc(MIN.) =    13.59
  EFFECTIVE AREA(ACRES) =     792.29   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1486.7
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11141.00 =   15891.01 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1486.7  TC(MIN.) =     13.59
  EFFECTIVE AREA(ACRES) =    792.29  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    2310.24

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2310.24   13.59    3.540  0.30( 0.30) 1.00     792.3   11130.00
      2     2268.97   29.31    2.029  0.30( 0.30) 1.00    1458.4   11111.00
      3     2245.04   30.66    1.978  0.30( 0.30) 1.00    1486.7   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:
```

```
------------------------------------------------------------------------
  FILE NAME: S12.DAT
  TIME/DATE OF STUDY: 09:58 04/01/2013
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.868
   2)   10.00;  4.278
   3)   15.00;  3.249
   4)   20.00;  2.620
   5)   25.00;  2.240
   6)   30.00;  1.995
   7)   40.00;  1.736
   8)   50.00;  1.482
   9)   60.00;  1.420
  10)   90.00;  1.225
  11)  120.00;  1.092
  12)  180.00;  0.931
  13)  360.00;  0.714
  14) 1440.00;  0.320
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  11220.00 TO NODE  11221.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   762.39
  ELEVATION DATA: UPSTREAM(FEET) =   3797.72  DOWNSTREAM(FEET) =   3296.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.919
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.089
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.02      0.30     1.000     0   10.92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     17.12
  TOTAL AREA(ACRES) =      5.02   PEAK FLOW RATE(CFS) =     17.12

************************************************************************
  FLOW PROCESS FROM NODE  11221.00 TO NODE  11223.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3296.86  DOWNSTREAM(FEET) =   2738.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   912.82   CHANNEL SLOPE =  0.6112
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.807
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.11
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   1.37
  Tc(MIN.) =   12.29
  SUBAREA AREA(ACRES) =    26.44       SUBAREA RUNOFF(CFS) =   83.46
  EFFECTIVE AREA(ACRES) =     31.46     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.5          PEAK FLOW RATE(CFS) =      99.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.66   FLOW VELOCITY(FEET/SEC.) =  13.31
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11223.00 =    1675.21 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  11223.00 TO NODE  11224.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2738.96  DOWNSTREAM(FEET) =   2370.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.79   CHANNEL SLOPE =  0.3843
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.587
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     221.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.98
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   1.07
  Tc(MIN.) =   13.36
  SUBAREA AREA(ACRES) =    82.44       SUBAREA RUNOFF(CFS) =  243.91
  EFFECTIVE AREA(ACRES) =    113.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      113.9         PEAK FLOW RATE(CFS) =     337.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =  17.09
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11224.00 =    2635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2370.12  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.40   CHANNEL SLOPE =  0.2591
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.163
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     416.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.93
  AVERAGE FLOW DEPTH(FEET) =   1.90   TRAVEL TIME(MIN.) =   2.33
  Tc(MIN.) =   15.68
  SUBAREA AREA(ACRES) =    61.93       SUBAREA RUNOFF(CFS) =  159.59
  EFFECTIVE AREA(ACRES) =    175.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      175.8         PEAK FLOW RATE(CFS) =     453.11
```



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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.99   FLOW VELOCITY(FEET/SEC.) =  16.30
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S11.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2310.24   13.59  0.30( 0.30) 1.00     792.3   11130.00
      2     2268.97   29.31  0.30( 0.30) 1.00    1458.4   11111.00
      3     2245.04   30.66  0.30( 0.30) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =     1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11141.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2310.24   13.59  0.30( 0.30) 1.00     792.3   11130.00
      2     2268.97   29.31  0.30( 0.30) 1.00    1458.4   11111.00
      3     2245.04   30.66  0.30( 0.30) 1.00    1486.7   11101.00
    TOTAL AREA(ACRES) =      1486.7

****************************************************************************
  FLOW PROCESS FROM NODE  11141.00 TO NODE  11231.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1954.20  DOWNSTREAM(FEET) =   1794.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1435.64   CHANNEL SLOPE =  0.1116
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.282
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       89.78      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2430.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.12
  AVERAGE FLOW DEPTH(FEET) =   5.86   TRAVEL TIME(MIN.) =   1.25
  Tc(MIN.) =   14.84
  SUBAREA AREA(ACRES) =    89.78       SUBAREA RUNOFF(CFS) =  240.97
  EFFECTIVE AREA(ACRES) =    882.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1576.4          PEAK FLOW RATE(CFS) =    2367.53
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.78   FLOW VELOCITY(FEET/SEC.) =  19.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11224.00 TO NODE  11231.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2367.53   14.84    3.282  0.30( 0.30) 1.00     882.1   11130.00
      2     2340.92   30.58    1.980  0.30( 0.30) 1.00    1548.2   11111.00
      3     2334.00   31.93    1.945  0.30( 0.30) 1.00    1576.4   11101.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      453.11   15.68    3.163  0.30( 0.30) 1.00     175.8   11220.00
  LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11231.00 =    4858.40 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2814.09   14.84    3.282  0.30( 0.30) 1.00    1048.5   11130.00
      2     2819.21   15.68    3.163  0.30( 0.30) 1.00    1093.6   11220.00
      3     2606.79   30.58    1.980  0.30( 0.30) 1.00    1724.0   11111.00
      4     2594.33   31.93    1.945  0.30( 0.30) 1.00    1752.3   11101.00
    TOTAL AREA(ACRES) =      1752.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2819.21  Tc(MIN.) =   15.682
  EFFECTIVE AREA(ACRES) =   1093.58  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1752.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11231.00 =   17326.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.01  DOWNSTREAM(FEET) =   1680.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.84   CHANNEL SLOPE =  0.0585
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.906
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.78      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2889.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.73
  AVERAGE FLOW DEPTH(FEET) =   7.40   TRAVEL TIME(MIN.) =   2.05
  Tc(MIN.) =   17.73
  SUBAREA AREA(ACRES) =    59.78       SUBAREA RUNOFF(CFS) =  140.19
  EFFECTIVE AREA(ACRES) =   1153.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1812.1          PEAK FLOW RATE(CFS) =    2819.21
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.32   FLOW VELOCITY(FEET/SEC.) =  15.63
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11231.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.73
  RAINFALL INTENSITY(INCH/HR) =   2.91
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    1153.36
  TOTAL STREAM AREA(ACRES) =    1812.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2819.21

****************************************************************************
  FLOW PROCESS FROM NODE  11201.00 TO NODE  11202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   986.34
  ELEVATION DATA: UPSTREAM(FEET) =   3383.22  DOWNSTREAM(FEET) =   3248.87

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.343
```

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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.002
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 PUBLIC PARK                 -        8.54      0.30      1.000     0   11.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     28.45
 TOTAL AREA(ACRES) =      8.54   PEAK FLOW RATE(CFS) =     28.45

****************************************************************************
 FLOW PROCESS FROM NODE  11202.00 TO NODE  11203.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3248.87  DOWNSTREAM(FEET) =   3198.08
 CHANNEL LENGTH THRU SUBAREA(FEET) =   922.69   CHANNEL SLOPE =  0.0550
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.07
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.388
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       24.42      0.30      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.16
 AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   2.98
 Tc(MIN.) =   14.33
 SUBAREA AREA(ACRES) =    24.42       SUBAREA RUNOFF(CFS) =   67.87
 EFFECTIVE AREA(ACRES) =     32.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       33.0         PEAK FLOW RATE(CFS) =      91.60
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.26   FLOW VELOCITY(FEET/SEC.) =   5.83
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11203.00 =    1909.03 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11203.00 TO NODE  11204.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3198.08  DOWNSTREAM(FEET) =   3062.48
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1941.08   CHANNEL SLOPE =  0.0699
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.52
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.763
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
```



```
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       37.67      0.30      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     133.57
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.13
 AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   4.54
 Tc(MIN.) =   18.87
 SUBAREA AREA(ACRES) =    37.67       SUBAREA RUNOFF(CFS) =   83.50
 EFFECTIVE AREA(ACRES) =     70.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =     156.55
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.59

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.59   FLOW VELOCITY(FEET/SEC.) =   7.47
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11204.00 =    3850.11 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11204.00 TO NODE  11205.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3062.48  DOWNSTREAM(FEET) =   2940.56
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.73   CHANNEL SLOPE =  0.0636
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.84
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.390
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       34.87      0.30      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     189.39
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.68
 AVERAGE FLOW DEPTH(FEET) =   1.81   TRAVEL TIME(MIN.) =   4.16
 Tc(MIN.) =   23.03
 SUBAREA AREA(ACRES) =    34.87       SUBAREA RUNOFF(CFS) =   65.59
 EFFECTIVE AREA(ACRES) =    105.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      105.5         PEAK FLOW RATE(CFS) =     198.45
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.86   FLOW VELOCITY(FEET/SEC.) =   7.78
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11205.00 =    5766.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11205.00 TO NODE  11206.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

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 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2940.56  DOWNSTREAM(FEET) =   2581.93
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2865.58   CHANNEL SLOPE =  0.1252
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.76
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.114
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       56.17      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     244.34
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.50
 AVERAGE FLOW DEPTH(FEET) =   1.73   TRAVEL TIME(MIN.) =   4.55
 Tc(MIN.) =   27.57
 SUBAREA AREA(ACRES) =    56.17       SUBAREA RUNOFF(CFS) =   91.70
 EFFECTIVE AREA(ACRES) =    161.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      161.7         PEAK FLOW RATE(CFS) =     263.93
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.80

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.80   FLOW VELOCITY(FEET/SEC.) =  10.76
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11206.00 =    8632.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11206.00 TO NODE  11207.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2581.93  DOWNSTREAM(FEET) =   2317.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1985.44   CHANNEL SLOPE =  0.1333
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.02
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.002
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      546.87      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     683.05
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.47
 AVERAGE FLOW DEPTH(FEET) =   2.96   TRAVEL TIME(MIN.) =   2.29
 Tc(MIN.) =   29.86
 SUBAREA AREA(ACRES) =   546.87       SUBAREA RUNOFF(CFS) =  837.64
 EFFECTIVE AREA(ACRES) =    708.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      708.5         PEAK FLOW RATE(CFS) =    1085.27
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
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 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.76

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.76   FLOW VELOCITY(FEET/SEC.) =  16.48
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11207.00 =   10617.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2317.20  DOWNSTREAM(FEET) =   1680.94
 CHANNEL LENGTH THRU SUBAREA(FEET) =  4085.95   CHANNEL SLOPE =  0.1557
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.09
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.904
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      389.75      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1366.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.55
 AVERAGE FLOW DEPTH(FEET) =   4.06   TRAVEL TIME(MIN.) =   3.67
 Tc(MIN.) =   33.53
 SUBAREA AREA(ACRES) =   389.75       SUBAREA RUNOFF(CFS) =  562.50
 EFFECTIVE AREA(ACRES) =   1098.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1098.3         PEAK FLOW RATE(CFS) =    1585.10
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.38

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.38   FLOW VELOCITY(FEET/SEC.) =  19.31
 LONGEST FLOWPATH FROM NODE  11201.00 TO NODE  11241.00 =   14703.81 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11207.00 TO NODE  11241.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   33.53
 RAINFALL INTENSITY(INCH/HR) =   1.90
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    1098.29
 TOTAL STREAM AREA(ACRES) =    1098.29
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    1585.10

 ** CONFLUENCE DATA **
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```
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     2814.09   16.89    3.012  0.30( 0.30) 1.00    1108.2   11130.00
    1     2819.21   17.73    2.906  0.30( 0.30) 1.00    1153.4   11220.00
    1     2610.15   32.67    1.926  0.30( 0.30) 1.00    1783.8   11111.00
    1     2594.33   34.03    1.891  0.30( 0.30) 1.00    1812.1   11101.00
    2     1585.10   33.53    1.904  0.30( 0.30) 1.00    1098.3   11201.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     4163.96   16.89    3.012  0.30( 0.30) 1.00    1661.3   11130.00
    2     4181.06   17.73    2.906  0.30( 0.30) 1.00    1734.1   11220.00
    3     4176.06   32.67    1.926  0.30( 0.30) 1.00    2853.9   11111.00
    4     4185.21   33.53    1.904  0.30( 0.30) 1.00    2900.0   11201.00
    5     4166.73   34.03    1.891  0.30( 0.30) 1.00    2910.3   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    4185.21    Tc(MIN.) =    33.53
  EFFECTIVE AREA(ACRES) =    2900.00   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     2910.3
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11241.00 =   19260.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11241.00 TO NODE  11242.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1680.94  DOWNSTREAM(FEET) =   1521.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1795.61   CHANNEL SLOPE =  0.0890
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.10
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.866
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      198.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4325.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  20.39
  AVERAGE FLOW DEPTH(FEET) =   8.10   TRAVEL TIME(MIN.) =   1.47
  Tc(MIN.) =   35.00
  SUBAREA AREA(ACRES) =   198.62       SUBAREA RUNOFF(CFS) =  279.86
  EFFECTIVE AREA(ACRES) =   3098.62     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3109.0         PEAK FLOW RATE(CFS) =    4366.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) =  8.13   FLOW VELOCITY(FEET/SEC.) =  20.45
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11242.00 =   21056.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1521.21  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2223.33   CHANNEL SLOPE =  0.0797
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.817
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       95.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4431.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.70
  AVERAGE FLOW DEPTH(FEET) =   8.40   TRAVEL TIME(MIN.) =   1.88
  Tc(MIN.) =   36.88
  SUBAREA AREA(ACRES) =    95.39       SUBAREA RUNOFF(CFS) =  130.23
  EFFECTIVE AREA(ACRES) =   3194.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3204.3         PEAK FLOW RATE(CFS) =    4366.04
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.34   FLOW VELOCITY(FEET/SEC.) =  19.64
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11242.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   36.88
  RAINFALL INTENSITY(INCH/HR) =   1.82
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3194.01
  TOTAL STREAM AREA(ACRES) =    3204.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    4366.04

****************************************************************************
  FLOW PROCESS FROM NODE  11250.00 TO NODE  11251.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   982.50
  ELEVATION DATA: UPSTREAM(FEET) =   3806.44  DOWNSTREAM(FEET) =   3168.25

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.112
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.843
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.91      0.30     1.000     0   12.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     18.85
  TOTAL AREA(ACRES) =      5.91   PEAK FLOW RATE(CFS) =     18.85

****************************************************************************
  FLOW PROCESS FROM NODE  11251.00 TO NODE  11252.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3168.25  DOWNSTREAM(FEET) =   2683.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.5240
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.494
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.09
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   1.70
  Tc(MIN.) =   13.81
  SUBAREA AREA(ACRES) =    13.73       SUBAREA RUNOFF(CFS) =   39.47
  EFFECTIVE AREA(ACRES) =     19.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       19.6         PEAK FLOW RATE(CFS) =      56.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =  10.42
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11252.00 =    1908.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11252.00 TO NODE  11253.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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```
  ELEVATION DATA: UPSTREAM(FEET) =   2683.24  DOWNSTREAM(FEET) =   2334.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.66   CHANNEL SLOPE =  0.3694
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.239
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       55.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     130.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.42
  AVERAGE FLOW DEPTH(FEET) =   0.89   TRAVEL TIME(MIN.) =   1.27
  Tc(MIN.) =   15.08
  SUBAREA AREA(ACRES) =    55.67       SUBAREA RUNOFF(CFS) =  147.27
  EFFECTIVE AREA(ACRES) =     75.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       75.3         PEAK FLOW RATE(CFS) =     199.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.13   FLOW VELOCITY(FEET/SEC.) =  14.32
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11253.00 =    2852.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11253.00 TO NODE  11254.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2334.26  DOWNSTREAM(FEET) =   1768.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2293.59   CHANNEL SLOPE =  0.2468
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.927
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      165.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     395.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.42
  AVERAGE FLOW DEPTH(FEET) =   1.87   TRAVEL TIME(MIN.) =   2.48
  Tc(MIN.) =   17.56
  SUBAREA AREA(ACRES) =   165.43       SUBAREA RUNOFF(CFS) =  391.20
  EFFECTIVE AREA(ACRES) =    240.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      240.7         PEAK FLOW RATE(CFS) =     569.29
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.28
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.28   FLOW VELOCITY(FEET/SEC.) =  17.17
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11254.00 =    5146.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11254.00 TO NODE  11255.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1768.11  DOWNSTREAM(FEET) =   1506.97
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1897.59   CHANNEL SLOPE =  0.1376
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.19
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.665
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     776.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.19
  AVERAGE FLOW DEPTH(FEET) =   3.14   TRAVEL TIME(MIN.) =   2.08
  Tc(MIN.) =   19.64
  SUBAREA AREA(ACRES) =   194.55       SUBAREA RUNOFF(CFS) =  414.20
  EFFECTIVE AREA(ACRES) =    435.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      435.3         PEAK FLOW RATE(CFS) =     926.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.44   FLOW VELOCITY(FEET/SEC.) =  15.94
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11255.00 =    7043.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.97  DOWNSTREAM(FEET) =   1343.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =   882.10   CHANNEL SLOPE =  0.1848
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.44
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.587
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      137.86      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1068.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.48
```



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  AVERAGE FLOW DEPTH(FEET) =   3.43   TRAVEL TIME(MIN.) =   0.80
  Tc(MIN.) =   20.43
  SUBAREA AREA(ACRES) =   137.86       SUBAREA RUNOFF(CFS) =  283.77
  EFFECTIVE AREA(ACRES) =    573.15     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      573.1         PEAK FLOW RATE(CFS) =    1179.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.61   FLOW VELOCITY(FEET/SEC.) =  18.97
  LONGEST FLOWPATH FROM NODE  11250.00 TO NODE  11261.00 =    7926.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11255.00 TO NODE  11261.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.43
  RAINFALL INTENSITY(INCH/HR) =   2.59
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     573.15
  TOTAL STREAM AREA(ACRES) =     573.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1179.75

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4231.58   20.24    2.602  0.30( 0.30) 1.00    1955.3   11130.00
      1     4212.52   21.09    2.537  0.30( 0.30) 1.00    2028.1   11220.00
      1     4362.25   36.02    1.839  0.30( 0.30) 1.00    3147.9   11111.00
      1     4366.04   36.88    1.817  0.30( 0.30) 1.00    3194.0   11201.00
      1     4344.64   37.38    1.804  0.30( 0.30) 1.00    3204.3   11101.00
      2     1179.75   20.43    2.587  0.30( 0.30) 1.00     573.1   11250.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5407.64   20.24    2.602  0.30( 0.30) 1.00    2523.0   11130.00
      2     5406.94   20.43    2.587  0.30( 0.30) 1.00    2545.2   11250.00
      3     5366.71   21.09    2.537  0.30( 0.30) 1.00    2601.3   11220.00
      4     5156.20   36.02    1.839  0.30( 0.30) 1.00    3721.1   11111.00
      5     5148.49   36.88    1.817  0.30( 0.30) 1.00    3767.2   11201.00
      6     5120.45   37.38    1.804  0.30( 0.30) 1.00    3777.5   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    5407.64   Tc(MIN.) =    20.24
  EFFECTIVE AREA(ACRES) =    2523.02   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
```

```
  TOTAL AREA(ACRES) =     3777.5
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11261.00 =   23279.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1343.95  DOWNSTREAM(FEET) =   1299.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =   889.38   CHANNEL SLOPE =  0.0503
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.538
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.65      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5487.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.53
  AVERAGE FLOW DEPTH(FEET) =  10.26   TRAVEL TIME(MIN.) =   0.85
  Tc(MIN.) =   21.08
  SUBAREA AREA(ACRES) =    79.65       SUBAREA RUNOFF(CFS) =  160.40
  EFFECTIVE AREA(ACRES) =   2602.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3857.1         PEAK FLOW RATE(CFS) =    5407.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.19   FLOW VELOCITY(FEET/SEC.) =  17.47
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11310.00 =   24168.81 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3857.1  TC(MIN.) =     21.08
  EFFECTIVE AREA(ACRES) =   2602.67  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =    5407.64

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     5407.64   21.08    2.538  0.30( 0.30) 1.00    2602.7   11130.00
      2     5406.94   21.28    2.523  0.30( 0.30) 1.00    2624.9   11250.00
      3     5366.71   21.93    2.473  0.30( 0.30) 1.00    2680.9   11220.00
      4     5189.01   36.88    1.817  0.30( 0.30) 1.00    3800.7   11111.00
      5     5174.77   37.74    1.795  0.30( 0.30) 1.00    3846.8   11201.00
      6     5143.78   38.24    1.782  0.30( 0.30) 1.00    3857.1   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




----------------------------------------------------------------------------
  FILE NAME: S13.DAT
  TIME/DATE OF STUDY: 09:58 04/01/2013
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.868
   2)   10.00;  4.278
   3)   15.00;  3.249
   4)   20.00;  2.620
   5)   25.00;  2.240
   6)   30.00;  1.995
   7)   40.00;  1.736
   8)   50.00;  1.482
   9)   60.00;  1.420
  10)   90.00;  1.225
  11)  120.00;  1.092
  12)  180.00;  0.931
  13)  360.00;  0.714
  14) 1440.00;  0.320
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11300.00 TO NODE  11301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   455.90
  ELEVATION DATA: UPSTREAM(FEET) =   3394.67  DOWNSTREAM(FEET) =   3247.06

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.240
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.229
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        2.53      0.30     1.000     0   10.24
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.95
  TOTAL AREA(ACRES) =      2.53   PEAK FLOW RATE(CFS) =      8.95

****************************************************************************
  FLOW PROCESS FROM NODE  11301.00 TO NODE  11301.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3247.06  DOWNSTREAM(FEET) =   3150.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   468.69   CHANNEL SLOPE =  0.2059
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.43
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.956
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       10.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.89
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   1.33
  Tc(MIN.) =   11.57
  SUBAREA AREA(ACRES) =    10.95       SUBAREA RUNOFF(CFS) =   36.03
  EFFECTIVE AREA(ACRES) =     13.48     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.5          PEAK FLOW RATE(CFS) =      44.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   7.10
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11301.50 =     924.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11301.50 TO NODE  11302.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3150.57  DOWNSTREAM(FEET) =   2840.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =   982.20   CHANNEL SLOPE =  0.3162
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.580
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.96
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   1.83
  Tc(MIN.) =   13.39
  SUBAREA AREA(ACRES) =     9.59       SUBAREA RUNOFF(CFS) =   28.31
  EFFECTIVE AREA(ACRES) =     23.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.1         PEAK FLOW RATE(CFS) =      68.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   9.47
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11302.00 =    1906.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11302.00 TO NODE  11303.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2840.04  DOWNSTREAM(FEET) =   2177.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.03   CHANNEL SLOPE =  0.3460
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.152
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     176.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.44
  AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   2.38
  Tc(MIN.) =   15.77
  SUBAREA AREA(ACRES) =    84.31       SUBAREA RUNOFF(CFS) =  216.44
  EFFECTIVE AREA(ACRES) =    107.38     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.4         PEAK FLOW RATE(CFS) =     275.67
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.39   FLOW VELOCITY(FEET/SEC.) =  15.50
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11303.00 =    3822.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11303.00 TO NODE  11304.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2177.16  DOWNSTREAM(FEET) =   1612.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2472.34   CHANNEL SLOPE =  0.2285
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.805
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       99.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     388.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.91
  AVERAGE FLOW DEPTH(FEET) =   1.89   TRAVEL TIME(MIN.) =   2.76
  Tc(MIN.) =   18.53
  SUBAREA AREA(ACRES) =    99.61       SUBAREA RUNOFF(CFS) =  224.55
  EFFECTIVE AREA(ACRES) =    206.99     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.0         PEAK FLOW RATE(CFS) =     466.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.09   FLOW VELOCITY(FEET/SEC.) =  15.71
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11304.00 =    6295.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1612.27  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2432.96   CHANNEL SLOPE =  0.1604
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.46
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.517
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.86      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     520.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.34
  AVERAGE FLOW DEPTH(FEET) =   2.44   TRAVEL TIME(MIN.) =   2.83
  Tc(MIN.) =   21.36
  SUBAREA AREA(ACRES) =    53.86       SUBAREA RUNOFF(CFS) =  107.46
  EFFECTIVE AREA(ACRES) =    260.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      260.8          PEAK FLOW RATE(CFS) =     520.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.44   FLOW VELOCITY(FEET/SEC.) =  14.35
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S12.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     5407.64   21.08  0.30( 0.30) 1.00    2602.7   11130.00
      2     5406.94   21.28  0.30( 0.30) 1.00    2624.9   11250.00
      3     5366.71   21.93  0.30( 0.30) 1.00    2680.9   11220.00
      4     5189.01   36.88  0.30( 0.30) 1.00    3800.7   11111.00
      5     5174.77   37.74  0.30( 0.30) 1.00    3846.8   11201.00
      6     5143.78   38.24  0.30( 0.30) 1.00    3857.1   11101.00
    TOTAL AREA(ACRES) =     3857.1

****************************************************************************
  FLOW PROCESS FROM NODE  11261.00 TO NODE  11310.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     5407.64   21.08  0.30( 0.30) 1.00    2602.7   11130.00
      2     5406.94   21.28  0.30( 0.30) 1.00    2624.9   11250.00
      3     5366.71   21.93  0.30( 0.30) 1.00    2680.9   11220.00
      4     5189.01   36.88  0.30( 0.30) 1.00    3800.7   11111.00
      5     5174.77   37.74  0.30( 0.30) 1.00    3846.8   11201.00
      6     5143.78   38.24  0.30( 0.30) 1.00    3857.1   11101.00
    TOTAL AREA(ACRES) =     3857.1
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  11310.00 TO NODE  11320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1299.17  DOWNSTREAM(FEET) =   1222.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1694.05   CHANNEL SLOPE =  0.0455
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.410
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.22      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5486.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.87
  AVERAGE FLOW DEPTH(FEET) =  10.49   TRAVEL TIME(MIN.) =   1.67
  Tc(MIN.) =   22.76
  SUBAREA AREA(ACRES) =    83.22       SUBAREA RUNOFF(CFS) =  158.07
  EFFECTIVE AREA(ACRES) =   2685.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3940.4          PEAK FLOW RATE(CFS) =    5407.64
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.42   FLOW VELOCITY(FEET/SEC.) =  16.82
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11304.00 TO NODE  11320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5407.64   22.76    2.410  0.30( 0.30) 1.00    2685.9   11130.00
      2     5406.94   22.95    2.396  0.30( 0.30) 1.00    2708.1   11250.00
      3     5366.71   23.61    2.346  0.30( 0.30) 1.00    2764.1   11220.00
      4     5189.01   38.57    1.773  0.30( 0.30) 1.00    3884.0   11111.00
      5     5174.77   39.43    1.751  0.30( 0.30) 1.00    3930.0   11201.00
      6     5143.78   39.93    1.738  0.30( 0.30) 1.00    3940.4   11101.00
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      520.43   21.36    2.517  0.30( 0.30) 1.00     260.8   11300.00
  LONGEST FLOWPATH FROM NODE  11300.00 TO NODE  11320.00 =    8728.12 FEET.
```

```
** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)     NODE
    1     5851.31   21.36    2.517  0.30( 0.30) 1.00    2781.6   11300.00
    2     5903.10   22.76    2.410  0.30( 0.30) 1.00    2946.7   11130.00
    3     5898.92   22.95    2.396  0.30( 0.30) 1.00    2969.0   11250.00
    4     5846.98   23.61    2.346  0.30( 0.30) 1.00    3025.0   11220.00
    5     5534.85   38.57    1.773  0.30( 0.30) 1.00    4144.8   11111.00
    6     5515.38   39.43    1.751  0.30( 0.30) 1.00    4190.9   11201.00
    7     5481.33   39.93    1.738  0.30( 0.30) 1.00    4201.2   11101.00
  TOTAL AREA(ACRES) =      4201.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     5903.10  Tc(MIN.) =   22.758
 EFFECTIVE AREA(ACRES) =   2946.74  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4201.2
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11320.00 =   25862.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1222.10  DOWNSTREAM(FEET) =   1092.58
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3157.19   CHANNEL SLOPE =  0.0410
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.36
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.196
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      328.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6183.45
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.74
 AVERAGE FLOW DEPTH(FEET) =  11.32   TRAVEL TIME(MIN.) =   3.14
 Tc(MIN.) =   25.90
 SUBAREA AREA(ACRES) =   328.55       SUBAREA RUNOFF(CFS) =  560.60
 EFFECTIVE AREA(ACRES) =   3275.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     4529.8         PEAK FLOW RATE(CFS) =    5903.10
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.09

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 11.09   FLOW VELOCITY(FEET/SEC.) =  16.54
 LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11320.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   25.90
 RAINFALL INTENSITY(INCH/HR) =   2.20
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    3275.29
 TOTAL STREAM AREA(ACRES) =    4529.77
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    5903.10

****************************************************************************
 FLOW PROCESS FROM NODE  11330.00 TO NODE  11331.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   299.83
 ELEVATION DATA: UPSTREAM(FEET) =   3270.16  DOWNSTREAM(FEET) =   3123.64

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.975
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.327
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        1.69      0.30     1.000     0    7.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      7.65
 TOTAL AREA(ACRES) =      1.69   PEAK FLOW RATE(CFS) =      7.65

****************************************************************************
 FLOW PROCESS FROM NODE  11331.00 TO NODE  11332.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3123.64  DOWNSTREAM(FEET) =   2903.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =   710.41   CHANNEL SLOPE =  0.3104
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.277
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        5.82      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.20
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.83
 AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   2.03
 Tc(MIN.) =   10.00
 SUBAREA AREA(ACRES) =     5.82       SUBAREA RUNOFF(CFS) =   20.83
 EFFECTIVE AREA(ACRES) =      7.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        7.5         PEAK FLOW RATE(CFS) =      26.88
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =   6.75
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11332.00 =    1010.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11332.00 TO NODE  11333.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2903.10  DOWNSTREAM(FEET) =   2718.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   843.93   CHANNEL SLOPE =  0.2183
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.55
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.870
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.11
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   1.98
  Tc(MIN.) =   11.98
  SUBAREA AREA(ACRES) =     9.66       SUBAREA RUNOFF(CFS) =   31.04
  EFFECTIVE AREA(ACRES) =     17.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.2         PEAK FLOW RATE(CFS) =      55.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.63   FLOW VELOCITY(FEET/SEC.) =   7.80
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11333.00 =    1854.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11333.00 TO NODE  11334.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2718.89  DOWNSTREAM(FEET) =   2364.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1084.60   CHANNEL SLOPE =  0.3264
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.66
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.488
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      71.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.74
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   1.86
  Tc(MIN.) =   13.84
  SUBAREA AREA(ACRES) =    11.67       SUBAREA RUNOFF(CFS) =   33.48
  EFFECTIVE AREA(ACRES) =     28.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.8         PEAK FLOW RATE(CFS) =      82.74
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOW VELOCITY(FEET/SEC.) =  10.26
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11334.00 =    2938.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11334.00 TO NODE  11335.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2364.84  DOWNSTREAM(FEET) =   1729.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.08   CHANNEL SLOPE =  0.3237
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.100
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      102.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     212.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.96
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   2.34
  Tc(MIN.) =   16.18
  SUBAREA AREA(ACRES) =   102.74       SUBAREA RUNOFF(CFS) =  258.91
  EFFECTIVE AREA(ACRES) =    131.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      131.6         PEAK FLOW RATE(CFS) =     331.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.57   FLOW VELOCITY(FEET/SEC.) =  16.02
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11335.00 =    4901.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1729.46  DOWNSTREAM(FEET) =   1092.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2702.07   CHANNEL SLOPE =  0.2357
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.02
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.735
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.38      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     430.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.52
  AVERAGE FLOW DEPTH(FEET) =   1.99   TRAVEL TIME(MIN.) =   2.90
  Tc(MIN.) =   19.09
  SUBAREA AREA(ACRES) =    90.38       SUBAREA RUNOFF(CFS) =  198.07
  EFFECTIVE AREA(ACRES) =    221.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      222.0         PEAK FLOW RATE(CFS) =     486.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.12   FLOW VELOCITY(FEET/SEC.) =  16.13
  LONGEST FLOWPATH FROM NODE  11330.00 TO NODE  11340.00 =    7603.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11335.00 TO NODE  11340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.09
  RAINFALL INTENSITY(INCH/HR) =   2.73
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     221.96
  TOTAL STREAM AREA(ACRES) =     221.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     486.43

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5851.31   24.51    2.277  0.30( 0.30) 1.00    3110.1   11300.00
      1     5903.10   25.90    2.196  0.30( 0.30) 1.00    3275.3   11130.00
      1     5898.92   26.10    2.186  0.30( 0.30) 1.00    3297.5   11250.00
      1     5846.98   26.76    2.154  0.30( 0.30) 1.00    3353.5   11220.00
      1     5600.44   41.77    1.691  0.30( 0.30) 1.00    4473.4   11111.00
      1     5568.74   42.64    1.669  0.30( 0.30) 1.00    4519.4   11201.00
      1     5528.88   43.15    1.656  0.30( 0.30) 1.00    4529.8   11101.00
      2      486.43   19.09    2.735  0.30( 0.30) 1.00     222.0   11330.00
```



```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6097.70   19.09    2.735  0.30( 0.30) 1.00    2644.1   11330.00
      2     6246.34   24.51    2.277  0.30( 0.30) 1.00    3332.1   11300.00
      3     6281.83   25.90    2.196  0.30( 0.30) 1.00    3497.2   11130.00
      4     6275.72   26.10    2.186  0.30( 0.30) 1.00    3519.5   11250.00
      5     6217.31   26.76    2.154  0.30( 0.30) 1.00    3575.5   11220.00
      6     5878.33   41.77    1.691  0.30( 0.30) 1.00    4695.3   11111.00
      7     5842.23   42.64    1.669  0.30( 0.30) 1.00    4741.4   11201.00
      8     5799.80   43.15    1.656  0.30( 0.30) 1.00    4751.7   11101.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    6281.83    Tc(MIN.) =    25.90
  EFFECTIVE AREA(ACRES) =    3497.25   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     4751.7
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11340.00 =   29020.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11340.00 TO NODE  11341.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1092.58  DOWNSTREAM(FEET) =   1055.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.69   CHANNEL SLOPE =  0.0259
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.65
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.113
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6326.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.17
  AVERAGE FLOW DEPTH(FEET) =  12.65   TRAVEL TIME(MIN.) =   1.68
  Tc(MIN.) =   27.59
  SUBAREA AREA(ACRES) =    54.55       SUBAREA RUNOFF(CFS) =   89.03
  EFFECTIVE AREA(ACRES) =   3551.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4806.3         PEAK FLOW RATE(CFS) =    6281.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.61   FLOW VELOCITY(FEET/SEC.) =  14.15
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11341.00 =   30452.74 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11341.00 TO NODE  11342.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1055.49  DOWNSTREAM(FEET) =   1017.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.89   CHANNEL SLOPE =  0.0406
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.067
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      119.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6377.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.80
  AVERAGE FLOW DEPTH(FEET) =  11.50   TRAVEL TIME(MIN.) =   0.94
  Tc(MIN.) =   28.52
  SUBAREA AREA(ACRES) =   119.96       SUBAREA RUNOFF(CFS) =  190.82
  EFFECTIVE AREA(ACRES) =   3671.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4926.2         PEAK FLOW RATE(CFS) =    6281.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.42   FLOW VELOCITY(FEET/SEC.) =  16.74
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11342.00 =   31396.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1017.16  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1557.63   CHANNEL SLOPE =  0.0383
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.992
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.25      0.30     0.990     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6346.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.42
  AVERAGE FLOW DEPTH(FEET) =  11.62   TRAVEL TIME(MIN.) =   1.58
  Tc(MIN.) =   30.10
  SUBAREA AREA(ACRES) =    85.25       SUBAREA RUNOFF(CFS) =  130.08
```



```
  EFFECTIVE AREA(ACRES) =   3757.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5011.5         PEAK FLOW RATE(CFS) =    6281.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.57   FLOW VELOCITY(FEET/SEC.) =  16.38
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11342.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.10
  RAINFALL INTENSITY(INCH/HR) =   1.99
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3757.01
  TOTAL STREAM AREA(ACRES) =    5011.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    6281.83

****************************************************************************
  FLOW PROCESS FROM NODE  11350.00 TO NODE  11351.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   950.54
  ELEVATION DATA: UPSTREAM(FEET) =   2805.98  DOWNSTREAM(FEET) =   2583.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.655
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.320
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.40      0.30     1.000     0   14.66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     14.68
  TOTAL AREA(ACRES) =      5.40   PEAK FLOW RATE(CFS) =     14.68

****************************************************************************
  FLOW PROCESS FROM NODE  11351.00 TO NODE  11352.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2583.16  DOWNSTREAM(FEET) =   2403.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.57   CHANNEL SLOPE =  0.1876
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.969
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.20
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   2.57
  Tc(MIN.) =   17.23
  SUBAREA AREA(ACRES) =    15.56       SUBAREA RUNOFF(CFS) =   37.37
  EFFECTIVE AREA(ACRES) =     20.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       21.0         PEAK FLOW RATE(CFS) =      50.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   7.19
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11352.00 =    1907.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11352.00 TO NODE  11353.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2403.73  DOWNSTREAM(FEET) =   1786.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1933.85   CHANNEL SLOPE =  0.3190
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.624
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       74.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     128.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.76
  AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =   2.74
  Tc(MIN.) =   19.97
  SUBAREA AREA(ACRES) =    74.05       SUBAREA RUNOFF(CFS) =  154.88
  EFFECTIVE AREA(ACRES) =     95.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       95.0         PEAK FLOW RATE(CFS) =     198.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =  13.55
```



```
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11353.00 =    3840.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11353.00 TO NODE  11354.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1786.74  DOWNSTREAM(FEET) =   1308.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2073.35   CHANNEL SLOPE =  0.2307
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.418
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       41.22      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     238.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.87
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   2.69
  Tc(MIN.) =   22.65
  SUBAREA AREA(ACRES) =    41.22       SUBAREA RUNOFF(CFS) =   78.59
  EFFECTIVE AREA(ACRES) =    136.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      136.2         PEAK FLOW RATE(CFS) =     259.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.51   FLOW VELOCITY(FEET/SEC.) =  13.23
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11354.00 =    5914.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.39  DOWNSTREAM(FEET) =    957.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2455.49   CHANNEL SLOPE =  0.1429
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.33
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.201
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      201.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     432.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.04
  AVERAGE FLOW DEPTH(FEET) =   2.28   TRAVEL TIME(MIN.) =   3.14
  Tc(MIN.) =   25.79
```

```
  SUBAREA AREA(ACRES) =   201.53       SUBAREA RUNOFF(CFS) =  344.83
  EFFECTIVE AREA(ACRES) =    337.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      337.8         PEAK FLOW RATE(CFS) =     577.92
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.66   FLOW VELOCITY(FEET/SEC.) =  14.18
  LONGEST FLOWPATH FROM NODE  11350.00 TO NODE  11360.00 =    8369.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11354.00 TO NODE  11360.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.79
  RAINFALL INTENSITY(INCH/HR) =   2.20
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     337.76
  TOTAL STREAM AREA(ACRES) =     337.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     577.92

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     6097.70   23.32    2.368  0.30( 0.30) 1.00    2903.9   11330.00
      1     6246.34   28.72    2.058  0.30( 0.30) 1.00    3591.9   11300.00
      1     6281.83   30.10    1.992  0.30( 0.30) 1.00    3757.0   11130.00
      1     6275.72   30.30    1.987  0.30( 0.30) 1.00    3779.2   11250.00
      1     6217.31   30.97    1.970  0.30( 0.30) 1.00    3835.3   11220.00
      1     5878.33   46.05    1.582  0.30( 0.30) 1.00    4955.1   11111.00
      1     5842.23   46.92    1.560  0.30( 0.30) 1.00    5001.1   11201.00
      1     5799.80   47.43    1.547  0.30( 0.30) 1.00    5011.5   11101.00
      2      577.92   25.79    2.201  0.30( 0.30) 1.00     337.8   11350.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     6665.96   23.32    2.368  0.30( 0.30) 1.00    3209.2   11330.00
      2     6743.83   25.79    2.201  0.30( 0.30) 1.00    3557.3   11350.00
      3     6780.75   28.72    2.058  0.30( 0.30) 1.00    3929.6   11300.00
      4     6796.29   30.10    1.992  0.30( 0.30) 1.00    4094.8   11130.00
      5     6788.61   30.30    1.987  0.30( 0.30) 1.00    4117.0   11250.00
      6     6724.92   30.97    1.970  0.30( 0.30) 1.00    4173.0   11220.00
      7     6268.18   46.05    1.582  0.30( 0.30) 1.00    5292.8   11111.00
      8     6225.35   46.92    1.560  0.30( 0.30) 1.00    5338.9   11201.00
      9     6178.94   47.43    1.547  0.30( 0.30) 1.00    5349.2   11101.00
```



```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    6796.29    Tc(MIN.) =    30.10
  EFFECTIVE AREA(ACRES) =    4094.77   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5349.2
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11360.00 =   32954.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11360.00 TO NODE  11361.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    957.53  DOWNSTREAM(FEET) =    847.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2937.03   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.15
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.916
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      176.74      0.30     0.977     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6925.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.64
  AVERAGE FLOW DEPTH(FEET) =  12.14   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   33.05
  SUBAREA AREA(ACRES) =   176.74       SUBAREA RUNOFF(CFS) =  258.18
  EFFECTIVE AREA(ACRES) =   4271.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5526.0         PEAK FLOW RATE(CFS) =    6796.29
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.04   FLOW VELOCITY(FEET/SEC.) =  16.56
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11361.00 =   35891.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11361.00 TO NODE  11362.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    847.62  DOWNSTREAM(FEET) =    738.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3869.90   CHANNEL SLOPE =  0.0283
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.08
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.805
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      429.50      0.30     0.995     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7087.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.07
  AVERAGE FLOW DEPTH(FEET) =  13.04   TRAVEL TIME(MIN.) =   4.28
  Tc(MIN.) =   37.32
  SUBAREA AREA(ACRES) =   429.50       SUBAREA RUNOFF(CFS) =  582.48
  EFFECTIVE AREA(ACRES) =   4701.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     5955.5          PEAK FLOW RATE(CFS) =    6796.29
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.80   FLOW VELOCITY(FEET/SEC.) =  14.90
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11362.00 =   39761.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    738.28  DOWNSTREAM(FEET) =    678.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2987.23   CHANNEL SLOPE =  0.0199
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.707
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.97      0.30     0.991     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.991
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    6876.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.11
  AVERAGE FLOW DEPTH(FEET) =  13.89   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   41.12
  SUBAREA AREA(ACRES) =   125.97       SUBAREA RUNOFF(CFS) =  159.88
  EFFECTIVE AREA(ACRES) =   4826.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6081.5          PEAK FLOW RATE(CFS) =    6796.29
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.82   FLOW VELOCITY(FEET/SEC.) =  13.07
  LONGEST FLOWPATH FROM NODE  11111.00 TO NODE  11363.00 =   42748.42 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     6081.5  TC(MIN.) =     41.12
  EFFECTIVE AREA(ACRES) =   4826.98  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.998
```



```
  PEAK FLOW RATE(CFS)   =    6796.29

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6665.96   34.38    1.882  0.30( 0.30) 1.00    3941.4   11330.00
      2     6743.83   36.83    1.818  0.30( 0.30) 1.00    4289.5   11350.00
      3     6780.75   39.74    1.743  0.30( 0.30) 1.00    4661.8   11300.00
      4     6796.29   41.12    1.707  0.30( 0.30) 1.00    4827.0   11130.00
      5     6788.61   41.32    1.702  0.30( 0.30) 1.00    4849.2   11250.00
      6     6724.92   42.02    1.685  0.30( 0.30) 1.00    4905.2   11220.00
      7     6268.18   57.30    1.437  0.30( 0.30) 1.00    6025.0   11111.00
      8     6225.35   58.20    1.431  0.30( 0.30) 1.00    6071.1   11201.00
      9     6178.94   58.73    1.428  0.30( 0.30) 1.00    6081.5   11101.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S14.DAT
  TIME/DATE OF STUDY: 09:58 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.780
   2)   10.00;  4.235
   3)   15.00;  3.221
   4)   20.00;  2.602
   5)   25.00;  2.227
   6)   30.00;  1.984
   7)   40.00;  1.726
   8)   50.00;  1.475
   9)   60.00;  1.408
  10)   90.00;  1.213
  11)  120.00;  1.079
  12)  180.00;  0.919
  13)  360.00;  0.703
  14) 1440.00;  0.315
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11401.00 TO NODE  11401.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   313.41
  ELEVATION DATA: UPSTREAM(FEET) =   3384.11  DOWNSTREAM(FEET) =   3232.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.137
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.183
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.25      0.30     1.000     0    8.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      9.89
  TOTAL AREA(ACRES) =      2.25   PEAK FLOW RATE(CFS) =      9.89

**************************************************************************
  FLOW PROCESS FROM NODE  11401.50 TO NODE  11402.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3232.76  DOWNSTREAM(FEET) =   3001.05
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.75   CHANNEL SLOPE =  0.3733
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.487
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.39      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.57
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   1.37
  Tc(MIN.) =    9.50
  SUBAREA AREA(ACRES) =    11.39       SUBAREA RUNOFF(CFS) =   42.93
  EFFECTIVE AREA(ACRES) =     13.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.6          PEAK FLOW RATE(CFS) =      51.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   9.03
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11402.00 =     934.16 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11402.00 TO NODE  11403.00 IS CODE =  56
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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3001.05  DOWNSTREAM(FEET) =   2787.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.99   CHANNEL SLOPE =  0.2213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.992
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      95.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.47
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   1.69
  Tc(MIN.) =   11.20
  SUBAREA AREA(ACRES) =    26.43       SUBAREA RUNOFF(CFS) =   87.82
  EFFECTIVE AREA(ACRES) =     40.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.1         PEAK FLOW RATE(CFS) =     133.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.04   FLOW VELOCITY(FEET/SEC.) =  10.57
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11403.00 =    1897.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11403.00 TO NODE  11404.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2787.96  DOWNSTREAM(FEET) =   2518.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1956.80   CHANNEL SLOPE =  0.1376
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.69
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.368
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       67.85      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     227.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.60
  AVERAGE FLOW DEPTH(FEET) =   1.62   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   14.28
  SUBAREA AREA(ACRES) =    67.85       SUBAREA RUNOFF(CFS) =  187.34
  EFFECTIVE AREA(ACRES) =    107.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      107.9         PEAK FLOW RATE(CFS) =     297.98
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.88   FLOW VELOCITY(FEET/SEC.) =  11.52
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11404.00 =    3853.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11404.00 TO NODE  11405.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2518.71  DOWNSTREAM(FEET) =   2304.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.99   CHANNEL SLOPE =  0.1101
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.963
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.61      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     394.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.56
  AVERAGE FLOW DEPTH(FEET) =   2.33   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   17.08
  SUBAREA AREA(ACRES) =    80.61       SUBAREA RUNOFF(CFS) =  193.23
  EFFECTIVE AREA(ACRES) =    188.53     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      188.5         PEAK FLOW RATE(CFS) =     451.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.51   FLOW VELOCITY(FEET/SEC.) =  12.02
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11405.00 =    5798.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11405.00 TO NODE  11406.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2304.57  DOWNSTREAM(FEET) =   1888.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3280.59   CHANNEL SLOPE =  0.1270
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.76
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.517
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      111.04      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     562.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.50
  AVERAGE FLOW DEPTH(FEET) =   2.71   TRAVEL TIME(MIN.) =   4.05
  Tc(MIN.) =   21.13
  SUBAREA AREA(ACRES) =   111.04       SUBAREA RUNOFF(CFS) =  221.58
  EFFECTIVE AREA(ACRES) =    299.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      299.6         PEAK FLOW RATE(CFS) =     597.79
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.80   FLOW VELOCITY(FEET/SEC.) =  13.72
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11406.00 =    9079.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11406.00 TO NODE  11407.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1888.00  DOWNSTREAM(FEET) =   1539.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2842.33   CHANNEL SLOPE =  0.1226
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.15
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.268
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      141.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     722.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.28
  AVERAGE FLOW DEPTH(FEET) =   3.12   TRAVEL TIME(MIN.) =   3.32
  Tc(MIN.) =   24.45
  SUBAREA AREA(ACRES) =   141.19       SUBAREA RUNOFF(CFS) =  250.14
  EFFECTIVE AREA(ACRES) =    440.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      440.8         PEAK FLOW RATE(CFS) =     780.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.25   FLOW VELOCITY(FEET/SEC.) =  14.59
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11407.00 =   11921.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11407.00 TO NODE  11408.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   1539.46  DOWNSTREAM(FEET) =   1268.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2859.01   CHANNEL SLOPE =  0.0948
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.77
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.087
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      158.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     908.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.85
  AVERAGE FLOW DEPTH(FEET) =   3.75   TRAVEL TIME(MIN.) =   3.44
  Tc(MIN.) =   27.89
  SUBAREA AREA(ACRES) =   158.63       SUBAREA RUNOFF(CFS) =  255.08
  EFFECTIVE AREA(ACRES) =    599.39     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      599.4         PEAK FLOW RATE(CFS) =     963.83
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.86   FLOW VELOCITY(FEET/SEC.) =  14.07
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11408.00 =   14780.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11408.00 TO NODE  11409.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1268.36  DOWNSTREAM(FEET) =   1109.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2883.36   CHANNEL SLOPE =  0.0550
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.935
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      208.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1117.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.01
  AVERAGE FLOW DEPTH(FEET) =   4.77   TRAVEL TIME(MIN.) =   4.00
  Tc(MIN.) =   31.89
  SUBAREA AREA(ACRES) =   208.66       SUBAREA RUNOFF(CFS) =  307.09
  EFFECTIVE AREA(ACRES) =    808.05     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      808.1         PEAK FLOW RATE(CFS) =    1189.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.92
```

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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.92   FLOW VELOCITY(FEET/SEC.) =  12.20
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.00 =   17664.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.00 TO NODE  11409.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1109.80  DOWNSTREAM(FEET) =    953.45
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2734.25   CHANNEL SLOPE =  0.0572
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.842
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       97.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1257.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.57
  AVERAGE FLOW DEPTH(FEET) =   5.00   TRAVEL TIME(MIN.) =   3.63
  Tc(MIN.) =   35.52
  SUBAREA AREA(ACRES) =    97.66       SUBAREA RUNOFF(CFS) =  135.51
  EFFECTIVE AREA(ACRES) =    905.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      905.7         PEAK FLOW RATE(CFS) =    1256.73
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.00   FLOW VELOCITY(FEET/SEC.) =  12.57
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11409.50 =   20398.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11409.50 TO NODE  11410.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    953.45  DOWNSTREAM(FEET) =    914.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.66   CHANNEL SLOPE =  0.0357
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.80
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.798
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      130.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1344.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.75
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  AVERAGE FLOW DEPTH(FEET) =   5.80   TRAVEL TIME(MIN.) =   1.71
  Tc(MIN.) =   37.22
  SUBAREA AREA(ACRES) =   130.64       SUBAREA RUNOFF(CFS) =  176.09
  EFFECTIVE AREA(ACRES) =   1036.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1036.4         PEAK FLOW RATE(CFS) =    1396.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.90   FLOW VELOCITY(FEET/SEC.) =  10.85
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11410.00 =   21499.14 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11410.00 TO NODE  11411.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    914.20  DOWNSTREAM(FEET) =    740.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3015.96   CHANNEL SLOPE =  0.0576
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.702
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      299.66      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1585.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.40
  AVERAGE FLOW DEPTH(FEET) =   5.59   TRAVEL TIME(MIN.) =   3.75
  Tc(MIN.) =   40.98
  SUBAREA AREA(ACRES) =   299.66       SUBAREA RUNOFF(CFS) =  378.00
  EFFECTIVE AREA(ACRES) =   1336.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1336.0         PEAK FLOW RATE(CFS) =    1685.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.76   FLOW VELOCITY(FEET/SEC.) =  13.61
  LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11411.00 =   24515.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    740.43  DOWNSTREAM(FEET) =    651.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1605.97   CHANNEL SLOPE =  0.0553
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

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 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.89
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.652
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       70.41      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1728.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.49
 AVERAGE FLOW DEPTH(FEET) =   5.89   TRAVEL TIME(MIN.) =   1.98
 Tc(MIN.) =   42.96
 SUBAREA AREA(ACRES) =    70.41       SUBAREA RUNOFF(CFS) =   85.66
 EFFECTIVE AREA(ACRES) =   1406.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1406.4         PEAK FLOW RATE(CFS) =    1711.04
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.86

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.86   FLOW VELOCITY(FEET/SEC.) =  13.46
 LONGEST FLOWPATH FROM NODE  11401.00 TO NODE  11431.00 =   26121.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11411.00 TO NODE  11431.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S10.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1    14909.43   23.72  0.30( 0.30) 1.00    4362.5   11000.00
     2    16530.86   35.62  0.30( 0.30) 1.00    7395.7   10850.00
     3    16640.77   36.23  0.30( 0.30) 1.00    7558.4   10800.00
     4    16788.13   38.21  0.30( 0.30) 1.00    8152.4   10900.00
     5    16882.93   41.18  0.30( 0.30) 1.00    8950.5   10830.00
     6    16882.62   41.32  0.30( 0.30) 1.00    8983.3   10910.00
     7    16857.70   42.11  0.30( 0.30) 1.00    9148.8   10630.00
     8    16605.70   52.74  0.30( 0.30) 1.00   11528.9   10600.00
     9    16642.52   59.09  0.30( 0.30) 1.00   12978.1   10500.00
    10    16666.43   63.44  0.30( 0.30) 1.00   13906.7   10710.00
    11    16591.96   65.20  0.30( 0.30) 1.00   14210.9   10410.00
    12    16484.75   69.43  0.30( 0.30) 1.00   14865.2   10700.00
    13    16389.56   76.12  0.30( 0.30) 1.00   15831.7   10400.00
    14    16270.82   77.99  0.30( 0.30) 1.00   16056.8   10200.00
    15    15765.74   83.54  0.30( 0.30) 1.00   16618.4   10300.00
    16    15738.68   83.76  0.30( 0.30) 1.00   16633.0   10320.00
    17    15154.22   88.73  0.30( 0.30) 1.00   16839.9   10210.00
    18    14089.70  113.21  0.30( 0.30) 1.00   17533.1   10100.00
  TOTAL AREA(ACRES) =    17533.1
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****************************************************************************
 FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S13.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     6665.96   34.38  0.30( 0.30) 1.00    3941.4   11330.00
     2     6743.83   36.83  0.30( 0.30) 1.00    4289.5   11350.00
     3     6780.75   39.74  0.30( 0.30) 1.00    4661.8   11300.00
     4     6796.29   41.12  0.30( 0.30) 1.00    4827.0   11130.00
     5     6788.61   41.32  0.30( 0.30) 1.00    4849.2   11250.00
     6     6724.92   42.02  0.30( 0.30) 1.00    4905.2   11220.00
     7     6268.18   57.30  0.30( 0.30) 1.00    6025.0   11111.00
     8     6225.35   58.20  0.30( 0.30) 1.00    6071.1   11201.00
     9     6178.94   58.73  0.30( 0.30) 1.00    6081.5   11101.00
  TOTAL AREA(ACRES) =     6081.5

****************************************************************************
 FLOW PROCESS FROM NODE  11362.00 TO NODE  11363.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     6665.96   34.38  0.30( 0.30) 1.00    3941.4   11330.00
     2     6743.83   36.83  0.30( 0.30) 1.00    4289.5   11350.00
     3     6780.75   39.74  0.30( 0.30) 1.00    4661.8   11300.00
     4     6796.29   41.12  0.30( 0.30) 1.00    4827.0   11130.00
     5     6788.61   41.32  0.30( 0.30) 1.00    4849.2   11250.00
     6     6724.92   42.02  0.30( 0.30) 1.00    4905.2   11220.00
     7     6268.18   57.30  0.30( 0.30) 1.00    6025.0   11111.00
     8     6225.35   58.20  0.30( 0.30) 1.00    6071.1   11201.00
     9     6178.94   58.73  0.30( 0.30) 1.00    6081.5   11101.00
  TOTAL AREA(ACRES) =      6081.5

****************************************************************************
 FLOW PROCESS FROM NODE  11023.00 TO NODE  11363.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     6665.96   34.38    1.871  0.30( 0.30) 1.00    3941.4   11330.00
     2     6743.83   36.83    1.808  0.30( 0.30) 1.00    4289.5   11350.00
     3     6780.75   39.74    1.733  0.30( 0.30) 1.00    4661.8   11300.00
     4     6796.29   41.12    1.698  0.30( 0.30) 1.00    4827.0   11130.00
     5     6788.61   41.32    1.693  0.30( 0.30) 1.00    4849.2   11250.00
     6     6724.92   42.02    1.675  0.30( 0.30) 1.00    4905.2   11220.00
     7     6268.18   57.30    1.426  0.30( 0.30) 1.00    6025.0   11111.00
     8     6225.35   58.20    1.420  0.30( 0.30) 1.00    6071.1   11201.00
```

9	6178.94	58.73	1.416	0.30(0.30)	1.00	6081.5	11101.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14909.43	23.72	2.323	0.30(0.30)	1.00	4362.5	11000.00
2	16530.86	35.62	1.839	0.30(0.30)	1.00	7395.7	10850.00
3	16640.77	36.23	1.823	0.30(0.30)	1.00	7558.4	10800.00
4	16788.13	38.21	1.772	0.30(0.30)	1.00	8152.4	10900.00
5	16882.93	41.18	1.696	0.30(0.30)	1.00	8950.5	10830.00
6	16882.62	41.32	1.693	0.30(0.30)	1.00	8983.3	10910.00
7	16857.70	42.11	1.673	0.30(0.30)	1.00	9148.8	10630.00
8	16605.70	52.74	1.457	0.30(0.30)	1.00	11528.9	10600.00
9	16642.52	59.09	1.414	0.30(0.30)	1.00	12978.1	10500.00
10	16666.43	63.44	1.386	0.30(0.30)	1.00	13906.7	10710.00
11	16591.96	65.20	1.374	0.30(0.30)	1.00	14210.9	10410.00
12	16484.75	69.43	1.347	0.30(0.30)	1.00	14865.2	10700.00
13	16389.56	76.12	1.303	0.30(0.30)	1.00	15831.7	10400.00
14	16270.82	77.99	1.291	0.30(0.30)	1.00	16056.8	10200.00
15	15765.74	83.54	1.255	0.30(0.30)	1.00	16618.4	10300.00
16	15738.68	83.76	1.254	0.30(0.30)	1.00	16633.0	10320.00
17	15154.22	88.73	1.221	0.30(0.30)	1.00	16839.9	10210.00
18	14089.70	113.21	1.109	0.30(0.30)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20831.17	23.72	2.323	0.30(0.30)	1.00	7081.8	11000.00
2	23028.41	34.38	1.871	0.30(0.30)	1.00	11022.0	11330.00
3	23236.11	35.62	1.839	0.30(0.30)	1.00	11512.7	10850.00
4	23365.67	36.23	1.823	0.30(0.30)	1.00	11763.3	10800.00
5	23428.95	36.83	1.808	0.30(0.30)	1.00	12026.7	11350.00
6	23549.50	38.21	1.772	0.30(0.30)	1.00	12618.7	10900.00
7	23617.71	39.74	1.733	0.30(0.30)	1.00	13225.2	11300.00
8	23677.43	41.12	1.698	0.30(0.30)	1.00	13762.4	11130.00
9	23677.07	41.18	1.696	0.30(0.30)	1.00	13783.7	10830.00
10	23671.56	41.32	1.693	0.30(0.30)	1.00	13831.6	10910.00
11	23670.97	41.32	1.693	0.30(0.30)	1.00	13834.3	11250.00
12	23585.39	42.02	1.675	0.30(0.30)	1.00	14035.6	11220.00
13	23580.00	42.11	1.673	0.30(0.30)	1.00	14060.5	10630.00
14	23010.34	52.74	1.457	0.30(0.30)	1.00	17219.4	10600.00
15	22900.34	57.30	1.426	0.30(0.30)	1.00	18595.6	11111.00
16	22862.70	58.20	1.420	0.30(0.30)	1.00	18845.4	11201.00
17	22819.38	58.73	1.416	0.30(0.30)	1.00	18977.6	11101.00
18	22808.14	59.09	1.414	0.30(0.30)	1.00	19059.6	10500.00
19	22674.70	63.44	1.386	0.30(0.30)	1.00	19988.2	10710.00
20	22536.93	65.20	1.374	0.30(0.30)	1.00	20292.4	10410.00
21	22277.67	69.43	1.347	0.30(0.30)	1.00	20946.7	10700.00
22	21942.01	76.12	1.303	0.30(0.30)	1.00	21913.1	10400.00
23	21755.83	77.99	1.291	0.30(0.30)	1.00	22138.3	10200.00
24	21051.15	83.54	1.255	0.30(0.30)	1.00	22699.9	10300.00
25	21016.22	83.76	1.254	0.30(0.30)	1.00	22714.4	10320.00
26	20252.95	88.73	1.221	0.30(0.30)	1.00	22921.4	10210.00
27	18569.35	113.21	1.109	0.30(0.30)	1.00	23614.5	10100.00

TOTAL AREA(ACRES) = 23614.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 23677.43 Tc(MIN.) = 41.124
EFFECTIVE AREA(ACRES) = 13762.35 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 23614.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

****
FLOW PROCESS FROM NODE 11363.00 TO NODE 11431.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 678.93 DOWNSTREAM(FEET) = 651.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 2069.94 CHANNEL SLOPE = 0.0132
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050
*ESTIMATED CHANNEL HEIGHT(FEET) = 17.70
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.644
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.16	0.30	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23777.41
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.19
AVERAGE FLOW DEPTH(FEET) = 17.68 TRAVEL TIME(MIN.) = 2.13
Tc(MIN.) = 43.25
SUBAREA AREA(ACRES) = 165.16 SUBAREA RUNOFF(CFS) = 199.97
EFFECTIVE AREA(ACRES) = 13927.51 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 23779.7 PEAK FLOW RATE(CFS) = 23677.43
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050
*ESTIMATED CHANNEL HEIGHT(FEET) = 17.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 17.65 FLOW VELOCITY(FEET/SEC.) = 16.17
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

****
FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20831.17	25.92	2.182	0.30(0.30)	1.00	7247.0	11000.00
2	23028.41	36.53	1.816	0.30(0.30)	1.00	11187.2	11330.00
3	23236.11	37.76	1.784	0.30(0.30)	1.00	11677.9	10850.00
4	23365.67	38.37	1.768	0.30(0.30)	1.00	11928.5	10800.00
5	23428.95	38.96	1.753	0.30(0.30)	1.00	12191.9	11350.00
6	23549.50	40.35	1.717	0.30(0.30)	1.00	12783.9	10900.00
7	23617.71	41.87	1.679	0.30(0.30)	1.00	13390.4	11300.00

8	23677.43	43.25	1.644	0.30(0.30)	1.00	13927.5	11130.00
9	23677.07	43.31	1.643	0.30(0.30)	1.00	13948.9	10830.00
10	23671.56	43.45	1.639	0.30(0.30)	1.00	13996.7	10910.00
11	23670.97	43.45	1.639	0.30(0.30)	1.00	13999.4	11250.00
12	23585.39	44.15	1.622	0.30(0.30)	1.00	14200.8	11220.00
13	23580.00	44.24	1.620	0.30(0.30)	1.00	14225.6	10630.00
14	23010.34	54.88	1.442	0.30(0.30)	1.00	17384.6	10600.00
15	22900.34	59.45	1.412	0.30(0.30)	1.00	18760.7	11111.00
16	22862.70	60.35	1.406	0.30(0.30)	1.00	19010.6	11201.00
17	22819.38	60.88	1.402	0.30(0.30)	1.00	19142.8	11101.00
18	22808.14	61.24	1.400	0.30(0.30)	1.00	19224.8	10500.00
19	22674.70	65.59	1.372	0.30(0.30)	1.00	20153.3	10710.00
20	22536.93	67.36	1.360	0.30(0.30)	1.00	20457.5	10410.00
21	22277.67	71.59	1.333	0.30(0.30)	1.00	21111.8	10700.00
22	21942.01	78.29	1.289	0.30(0.30)	1.00	22078.3	10400.00
23	21755.83	80.17	1.277	0.30(0.30)	1.00	22303.4	10200.00
24	21051.15	85.74	1.241	0.30(0.30)	1.00	22865.0	10300.00
25	21016.22	85.96	1.239	0.30(0.30)	1.00	22879.6	10320.00
26	20252.95	90.95	1.209	0.30(0.30)	1.00	23086.6	10210.00
27	18569.35	115.48	1.099	0.30(0.30)	1.00	23779.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1711.04	42.96	1.652	0.30(0.30)	1.00	1406.4	11401.00

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22268.75	25.92	2.182	0.30(0.30)	1.00	8095.6	11000.00
2	24659.60	36.53	1.816	0.30(0.30)	1.00	12382.9	11330.00
3	24886.94	37.76	1.784	0.30(0.30)	1.00	12913.9	10850.00
4	25025.46	38.37	1.768	0.30(0.30)	1.00	13184.7	10800.00
5	25096.83	38.96	1.753	0.30(0.30)	1.00	13467.5	11350.00
6	25234.42	40.35	1.717	0.30(0.30)	1.00	14104.7	10900.00
7	25319.11	41.87	1.679	0.30(0.30)	1.00	14761.2	11300.00
8	25375.76	42.96	1.652	0.30(0.30)	1.00	15219.6	11401.00
9	25379.12	43.25	1.644	0.30(0.30)	1.00	15333.9	11130.00
10	25376.98	43.31	1.643	0.30(0.30)	1.00	15355.3	10830.00
11	25367.15	43.45	1.639	0.30(0.30)	1.00	15403.2	10910.00
12	25366.29	43.45	1.639	0.30(0.30)	1.00	15405.9	11250.00
13	25258.55	44.15	1.622	0.30(0.30)	1.00	15607.2	11220.00
14	25250.34	44.24	1.620	0.30(0.30)	1.00	15632.1	10630.00
15	24456.29	54.88	1.442	0.30(0.30)	1.00	18791.0	10600.00
16	24307.54	59.45	1.412	0.30(0.30)	1.00	20167.2	11111.00
17	24262.40	60.35	1.406	0.30(0.30)	1.00	20417.0	11201.00
18	24214.68	60.88	1.402	0.30(0.30)	1.00	20549.2	11101.00
19	24200.49	61.24	1.400	0.30(0.30)	1.00	20631.2	10500.00
20	24031.24	65.59	1.372	0.30(0.30)	1.00	21559.7	10710.00
21	23878.96	67.36	1.360	0.30(0.30)	1.00	21863.9	10410.00
22	23584.86	71.59	1.333	0.30(0.30)	1.00	22518.3	10700.00
23	23194.11	78.29	1.289	0.30(0.30)	1.00	23484.7	10400.00
24	22992.45	80.17	1.277	0.30(0.30)	1.00	23709.8	10200.00
25	22241.95	85.74	1.241	0.30(0.30)	1.00	24271.4	10300.00
26	22205.21	85.96	1.239	0.30(0.30)	1.00	24286.0	10320.00
27	21403.30	90.95	1.209	0.30(0.30)	1.00	24493.0	10210.00

28	19581.02	115.48	1.099	0.30(0.30)	1.00	25186.1	10100.00

TOTAL AREA(ACRES) = 25186.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 25379.12 Tc(MIN.) = 43.254
EFFECTIVE AREA(ACRES) = 15333.93 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25186.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 25186.1 TC(MIN.) = 43.25
EFFECTIVE AREA(ACRES) = 15333.93 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999
PEAK FLOW RATE(CFS) = 25379.12

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22268.75	25.92	2.182	0.30(0.30)	1.00	8095.6	11000.00
2	24659.60	36.53	1.816	0.30(0.30)	1.00	12382.9	11330.00
3	24886.94	37.76	1.784	0.30(0.30)	1.00	12913.9	10850.00
4	25025.46	38.37	1.768	0.30(0.30)	1.00	13184.7	10800.00
5	25096.83	38.96	1.753	0.30(0.30)	1.00	13467.5	11350.00
6	25234.42	40.35	1.717	0.30(0.30)	1.00	14104.7	10900.00
7	25319.11	41.87	1.679	0.30(0.30)	1.00	14761.2	11300.00
8	25375.76	42.96	1.652	0.30(0.30)	1.00	15219.6	11401.00
9	25379.12	43.25	1.644	0.30(0.30)	1.00	15333.9	11130.00
10	25376.98	43.31	1.643	0.30(0.30)	1.00	15355.3	10830.00
11	25367.15	43.45	1.639	0.30(0.30)	1.00	15403.2	10910.00
12	25366.29	43.45	1.639	0.30(0.30)	1.00	15405.9	11250.00
13	25258.55	44.15	1.622	0.30(0.30)	1.00	15607.2	11220.00
14	25250.34	44.24	1.620	0.30(0.30)	1.00	15632.1	10630.00
15	24456.29	54.88	1.442	0.30(0.30)	1.00	18791.0	10600.00
16	24307.54	59.45	1.412	0.30(0.30)	1.00	20167.2	11111.00
17	24262.40	60.35	1.406	0.30(0.30)	1.00	20417.0	11201.00
18	24214.68	60.88	1.402	0.30(0.30)	1.00	20549.2	11101.00
19	24200.49	61.24	1.400	0.30(0.30)	1.00	20631.2	10500.00
20	24031.24	65.59	1.372	0.30(0.30)	1.00	21559.7	10710.00
21	23878.96	67.36	1.360	0.30(0.30)	1.00	21863.9	10410.00
22	23584.86	71.59	1.333	0.30(0.30)	1.00	22518.3	10700.00
23	23194.11	78.29	1.289	0.30(0.30)	1.00	23484.7	10400.00
24	22992.45	80.17	1.277	0.30(0.30)	1.00	23709.8	10200.00
25	22241.95	85.74	1.241	0.30(0.30)	1.00	24271.4	10300.00
26	22205.21	85.96	1.239	0.30(0.30)	1.00	24286.0	10320.00
27	21403.30	90.95	1.209	0.30(0.30)	1.00	24493.0	10210.00
28	19581.02	115.48	1.099	0.30(0.30)	1.00	25186.1	10100.00

==========

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S15.DAT
  TIME/DATE OF STUDY: 09:58 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.507
   2)   10.00;  4.101
   3)   15.00;  3.134
   4)   20.00;  2.547
   5)   25.00;  2.187
   6)   30.00;  1.950
   7)   40.00;  1.693
   8)   50.00;  1.452
   9)   60.00;  1.373
  10)   90.00;  1.175
  11)  120.00;  1.041
  12)  180.00;  0.882
  13)  360.00;  0.668
  14) 1440.00;  0.297
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11500.00 TO NODE  11501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   352.85
  ELEVATION DATA: UPSTREAM(FEET) =   1891.25  DOWNSTREAM(FEET) =   1665.22

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.064
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.033
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        1.58      0.30     1.000     0    8.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.73
  TOTAL AREA(ACRES) =      1.58   PEAK FLOW RATE(CFS) =      6.73

**************************************************************************
  FLOW PROCESS FROM NODE  11501.00 TO NODE  11502.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1665.22  DOWNSTREAM(FEET) =   1423.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   627.67   CHANNEL SLOPE =  0.3849
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.30
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.233
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        6.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.29
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.66
  Tc(MIN.) =    9.73
  SUBAREA AREA(ACRES) =     6.84       SUBAREA RUNOFF(CFS) =   24.21
  EFFECTIVE AREA(ACRES) =      8.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.4          PEAK FLOW RATE(CFS) =      29.80
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =   7.48
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11502.00 =     980.52 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11502.00 TO NODE  11503.00 IS CODE =  56
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1423.64  DOWNSTREAM(FEET) =   1258.86
  CHANNEL LENGTH THRU SUBAREA(FEET) =   937.16   CHANNEL SLOPE =  0.1758
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.777
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.02
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   1.95
  Tc(MIN.) =   11.67
  SUBAREA AREA(ACRES) =    28.16       SUBAREA RUNOFF(CFS) =   88.13
  EFFECTIVE AREA(ACRES) =     36.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       36.6         PEAK FLOW RATE(CFS) =     114.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   9.27
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11503.00 =    1917.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11503.00 TO NODE  11504.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1258.86  DOWNSTREAM(FEET) =   1009.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.29   CHANNEL SLOPE =  0.1298
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.161
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       69.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     204.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.07
  AVERAGE FLOW DEPTH(FEET) =   1.55   TRAVEL TIME(MIN.) =   3.19
  Tc(MIN.) =   14.86
  SUBAREA AREA(ACRES) =    69.67       SUBAREA RUNOFF(CFS) =  179.40
  EFFECTIVE AREA(ACRES) =    106.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.2         PEAK FLOW RATE(CFS) =     273.60
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.82   FLOW VELOCITY(FEET/SEC.) =  11.02
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11504.00 =    3841.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1009.04  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2817.91   CHANNEL SLOPE =  0.1475
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.04
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.703
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       65.12      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     344.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.32
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   3.81
  Tc(MIN.) =   18.67
  SUBAREA AREA(ACRES) =    65.12       SUBAREA RUNOFF(CFS) =  140.84
  EFFECTIVE AREA(ACRES) =    171.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      171.4         PEAK FLOW RATE(CFS) =     370.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.08   FLOW VELOCITY(FEET/SEC.) =  12.60
  LONGEST FLOWPATH FROM NODE  11500.00 TO NODE  11520.00 =    6659.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S14.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    22268.75   25.92  0.30( 0.30) 1.00    8095.6   11000.00
```

```
      2    24659.60   36.53  0.30( 0.30) 1.00   12382.9   11330.00
      3    25025.46   38.37  0.30( 0.30) 1.00   13184.7   10800.00
      4    25096.83   38.96  0.30( 0.30) 1.00   13467.5   11350.00
      5    25234.42   40.35  0.30( 0.30) 1.00   14104.7   10900.00
      6    25319.11   41.87  0.30( 0.30) 1.00   14761.2   11300.00
      7    25379.12   43.25  0.30( 0.30) 1.00   15333.9   11130.00
      8    25258.55   44.15  0.30( 0.30) 1.00   15607.2   11220.00
      9    24456.29   54.88  0.30( 0.30) 1.00   18791.0   10600.00
     10    24307.54   59.45  0.30( 0.30) 1.00   20167.2   11111.00
     11    24262.40   60.35  0.30( 0.30) 1.00   20417.0   11201.00
     12    24214.68   60.88  0.30( 0.30) 1.00   20549.2   11101.00
     13    24031.24   65.59  0.30( 0.30) 1.00   21559.7   10710.00
     14    23878.96   67.36  0.30( 0.30) 1.00   21863.9   10410.00
     15    23584.86   71.59  0.30( 0.30) 1.00   22518.3   10700.00
     16    23194.11   78.29  0.30( 0.30) 1.00   23484.7   10400.00
     17    22992.45   80.17  0.30( 0.30) 1.00   23709.8   10200.00
     18    22241.95   85.74  0.30( 0.30) 1.00   24271.4   10300.00
     19    21403.30   90.95  0.30( 0.30) 1.00   24493.0   10210.00
     20    19581.02  115.48  0.30( 0.30) 1.00   25186.1   10100.00
    TOTAL AREA(ACRES) =    25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11431.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1    22268.75   25.92  0.30( 0.30) 1.00    8095.6   11000.00
      2    24659.60   36.53  0.30( 0.30) 1.00   12382.9   11330.00
      3    25025.46   38.37  0.30( 0.30) 1.00   13184.7   10800.00
      4    25096.83   38.96  0.30( 0.30) 1.00   13467.5   11350.00
      5    25234.42   40.35  0.30( 0.30) 1.00   14104.7   10900.00
      6    25319.11   41.87  0.30( 0.30) 1.00   14761.2   11300.00
      7    25379.12   43.25  0.30( 0.30) 1.00   15333.9   11130.00
      8    25258.55   44.15  0.30( 0.30) 1.00   15607.2   11220.00
      9    24456.29   54.88  0.30( 0.30) 1.00   18791.0   10600.00
     10    24307.54   59.45  0.30( 0.30) 1.00   20167.2   11111.00
     11    24262.40   60.35  0.30( 0.30) 1.00   20417.0   11201.00
     12    24214.68   60.88  0.30( 0.30) 1.00   20549.2   11101.00
     13    24031.24   65.59  0.30( 0.30) 1.00   21559.7   10710.00
     14    23878.96   67.36  0.30( 0.30) 1.00   21863.9   10410.00
     15    23584.86   71.59  0.30( 0.30) 1.00   22518.3   10700.00
     16    23194.11   78.29  0.30( 0.30) 1.00   23484.7   10400.00
     17    22992.45   80.17  0.30( 0.30) 1.00   23709.8   10200.00
     18    22241.95   85.74  0.30( 0.30) 1.00   24271.4   10300.00
     19    21403.30   90.95  0.30( 0.30) 1.00   24493.0   10210.00
     20    19581.02  115.48  0.30( 0.30) 1.00   25186.1   10100.00
    TOTAL AREA(ACRES) =     25186.1

****************************************************************************
  FLOW PROCESS FROM NODE  11431.00 TO NODE  11520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    651.70  DOWNSTREAM(FEET) =    593.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2004.08   CHANNEL SLOPE =  0.0291
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.20
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.578
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   25410.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  22.11
  AVERAGE FLOW DEPTH(FEET) =  15.20   TRAVEL TIME(MIN.) =   1.51
  Tc(MIN.) =   44.76
  SUBAREA AREA(ACRES) =    54.88       SUBAREA RUNOFF(CFS) =   63.13
  EFFECTIVE AREA(ACRES) =  15388.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    25241.0          PEAK FLOW RATE(CFS) =   25379.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.050
  *ESTIMATED CHANNEL HEIGHT(FEET) =  15.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 15.19   FLOW VELOCITY(FEET/SEC.) =  22.12
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11520.00 =   73228.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11504.00 TO NODE  11520.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22268.75   27.48    2.069  0.30( 0.30) 1.00    8150.4   11000.00
      2    24659.60   38.05    1.743  0.30( 0.30) 1.00   12437.8   11330.00
      3    25025.46   39.89    1.696  0.30( 0.30) 1.00   13239.6   10800.00
      4    25096.83   40.48    1.681  0.30( 0.30) 1.00   13522.4   11350.00
      5    25234.42   41.86    1.648  0.30( 0.30) 1.00   14159.6   10900.00
      6    25319.11   43.38    1.611  0.30( 0.30) 1.00   14816.1   11300.00
      7    25379.12   44.76    1.578  0.30( 0.30) 1.00   15388.8   11130.00
      8    25258.55   45.66    1.556  0.30( 0.30) 1.00   15662.1   11220.00
      9    24456.29   56.41    1.401  0.30( 0.30) 1.00   18845.9   10600.00
     10    24307.54   60.98    1.367  0.30( 0.30) 1.00   20222.0   11111.00
     11    24262.40   61.88    1.361  0.30( 0.30) 1.00   20471.9   11201.00
     12    24214.68   62.41    1.357  0.30( 0.30) 1.00   20604.1   11101.00
     13    24031.24   67.13    1.326  0.30( 0.30) 1.00   21614.6   10710.00
     14    23878.96   68.89    1.314  0.30( 0.30) 1.00   21918.8   10410.00
     15    23584.86   73.13    1.286  0.30( 0.30) 1.00   22573.1   10700.00
     16    23194.11   79.83    1.242  0.30( 0.30) 1.00   23539.6   10400.00
     17    22992.45   81.72    1.230  0.30( 0.30) 1.00   23764.7   10200.00
     18    22241.95   87.30    1.193  0.30( 0.30) 1.00   24326.3   10300.00
     19    21403.30   92.53    1.164  0.30( 0.30) 1.00   24547.9   10210.00
     20    19581.02  117.10    1.054  0.30( 0.30) 1.00   25241.0   10100.00
```

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	370.63	18.67	2.703	0.30(0.30)	1.00	171.4	11500.00

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20916.38	18.67	2.703	0.30(0.30)	1.00	5708.6	11500.00
2	22541.65	27.48	2.069	0.30(0.30)	1.00	8321.8	11000.00
3	24882.20	38.05	1.743	0.30(0.30)	1.00	12609.2	11330.00
4	25240.77	39.89	1.696	0.30(0.30)	1.00	13411.0	10800.00
5	25309.90	40.48	1.681	0.30(0.30)	1.00	13693.7	11350.00
6	25442.37	41.86	1.648	0.30(0.30)	1.00	14331.0	10900.00
7	25521.39	43.38	1.611	0.30(0.30)	1.00	14987.4	11300.00
8	25576.27	44.76	1.578	0.30(0.30)	1.00	15560.2	11130.00
9	25452.36	45.66	1.556	0.30(0.30)	1.00	15833.5	11220.00
10	24626.17	56.41	1.401	0.30(0.30)	1.00	19017.2	10600.00
11	24472.05	60.98	1.367	0.30(0.30)	1.00	20393.4	11111.00
12	24426.00	61.88	1.361	0.30(0.30)	1.00	20643.3	11201.00
13	24377.73	62.41	1.357	0.30(0.30)	1.00	20775.5	11101.00
14	24189.49	67.13	1.326	0.30(0.30)	1.00	21786.0	10710.00
15	24035.41	68.89	1.314	0.30(0.30)	1.00	22090.2	10410.00
16	23737.00	73.13	1.286	0.30(0.30)	1.00	22744.5	10700.00
17	23339.42	79.83	1.242	0.30(0.30)	1.00	23710.9	10400.00
18	23135.85	81.72	1.230	0.30(0.30)	1.00	23936.1	10200.00
19	22379.66	87.30	1.193	0.30(0.30)	1.00	24497.7	10300.00
20	21536.53	92.53	1.164	0.30(0.30)	1.00	24719.2	10210.00
21	19697.32	117.10	1.054	0.30(0.30)	1.00	25412.4	10100.00

TOTAL AREA(ACRES) = 25412.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 25576.27 Tc(MIN.) = 44.765
EFFECTIVE AREA(ACRES) = 15560.18 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25412.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

****
FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 593.37 DOWNSTREAM(FEET) = 577.77
CHANNEL LENGTH THRU SUBAREA(FEET) = 1515.75 CHANNEL SLOPE = 0.0103
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.28
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.539
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	100.60	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25632.38
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.67
AVERAGE FLOW DEPTH(FEET) = 11.27 TRAVEL TIME(MIN.) = 1.61
Tc(MIN.) = 46.38
SUBAREA AREA(ACRES) = 100.60 SUBAREA RUNOFF(CFS) = 112.21
EFFECTIVE AREA(ACRES) = 15660.78 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 25513.0 PEAK FLOW RATE(CFS) = 25576.27
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.26 FLOW VELOCITY(FEET/SEC.) = 15.66
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

****
FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 46.38
RAINFALL INTENSITY(INCH/HR) = 1.54
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 15660.78
TOTAL STREAM AREA(ACRES) = 25512.96
PEAK FLOW RATE(CFS) AT CONFLUENCE = 25576.27

****
FLOW PROCESS FROM NODE 11530.00 TO NODE 11531.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========
INITIAL SUBAREA FLOW-LENGTH(FEET) = 278.68
ELEVATION DATA: UPSTREAM(FEET) = 1593.31 DOWNSTREAM(FEET) = 1523.14

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.844
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.657
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	1.18	0.30	1.000	0	8.84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 4.63
TOTAL AREA(ACRES) = 1.18 PEAK FLOW RATE(CFS) = 4.63

****
FLOW PROCESS FROM NODE 11531.00 TO NODE 11532.00 IS CODE = 56

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1523.14  DOWNSTREAM(FEET) =   1297.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =   698.37   CHANNEL SLOPE =  0.3230
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.944
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        8.32      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.92
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.97
  Tc(MIN.) =   10.81
  SUBAREA AREA(ACRES) =     8.32       SUBAREA RUNOFF(CFS) =   27.29
  EFFECTIVE AREA(ACRES) =      9.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.5         PEAK FLOW RATE(CFS) =      31.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.40   FLOW VELOCITY(FEET/SEC.) =   7.22
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11532.00 =     977.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11532.00 TO NODE  11533.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1297.56  DOWNSTREAM(FEET) =   1134.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.17   CHANNEL SLOPE =  0.1693
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.72
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.520
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.31
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =   13.01
  SUBAREA AREA(ACRES) =    18.50       SUBAREA RUNOFF(CFS) =   53.61
  EFFECTIVE AREA(ACRES) =     28.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       28.0         PEAK FLOW RATE(CFS) =      81.14
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   8.16
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11533.00 =    1939.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11533.00 TO NODE  11534.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1134.68  DOWNSTREAM(FEET) =   1002.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =   956.78   CHANNEL SLOPE =  0.1379
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.222
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       98.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     210.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.37
  AVERAGE FLOW DEPTH(FEET) =   1.55   TRAVEL TIME(MIN.) =   1.54
  Tc(MIN.) =   14.54
  SUBAREA AREA(ACRES) =    98.44       SUBAREA RUNOFF(CFS) =  258.92
  EFFECTIVE AREA(ACRES) =    126.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      126.4         PEAK FLOW RATE(CFS) =     332.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.99   FLOW VELOCITY(FEET/SEC.) =  11.92
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11534.00 =    2896.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11534.00 TO NODE  11535.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1002.72  DOWNSTREAM(FEET) =    816.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2160.78   CHANNEL SLOPE =  0.0863
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.85
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.812
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.87      0.30     1.000     -
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     485.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.26
  AVERAGE FLOW DEPTH(FEET) =   2.77   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   17.74
  SUBAREA AREA(ACRES) =   134.87       SUBAREA RUNOFF(CFS) =  304.95
  EFFECTIVE AREA(ACRES) =    261.31     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      261.3         PEAK FLOW RATE(CFS) =     590.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.08   FLOW VELOCITY(FEET/SEC.) =  11.88
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11535.00 =    5056.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    816.20  DOWNSTREAM(FEET) =    577.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3109.20   CHANNEL SLOPE =  0.0767
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.393
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     664.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.78
  AVERAGE FLOW DEPTH(FEET) =   3.37   TRAVEL TIME(MIN.) =   4.40
  Tc(MIN.) =   22.14
  SUBAREA AREA(ACRES) =    78.24       SUBAREA RUNOFF(CFS) =  147.39
  EFFECTIVE AREA(ACRES) =    339.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      339.5         PEAK FLOW RATE(CFS) =     639.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.31   FLOW VELOCITY(FEET/SEC.) =  11.65
  LONGEST FLOWPATH FROM NODE  11530.00 TO NODE  11540.00 =    8165.98 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11535.00 TO NODE  11540.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```



```
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   22.14
RAINFALL INTENSITY(INCH/HR) =   2.39
AREA-AVERAGED Fm(INCH/HR) =  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30
AREA-AVERAGED Ap =  1.00
EFFECTIVE STREAM AREA(ACRES) =     339.55
TOTAL STREAM AREA(ACRES) =     339.55
PEAK FLOW RATE(CFS) AT CONFLUENCE =     639.65

** CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1    20916.38   20.38    2.519  0.30( 0.30) 1.00     5809.2   11500.00
    1    22541.65   29.16    1.990  0.30( 0.30) 1.00     8422.4   11000.00
    1    24882.20   39.67    1.701  0.30( 0.30) 1.00    12709.8   11330.00
    1    25240.77   41.51    1.657  0.30( 0.30) 1.00    13511.6   10800.00
    1    25309.90   42.10    1.642  0.30( 0.30) 1.00    13794.3   11350.00
    1    25442.37   43.47    1.609  0.30( 0.30) 1.00    14431.6   10900.00
    1    25521.39   45.00    1.573  0.30( 0.30) 1.00    15088.0   11300.00
    1    25576.27   46.38    1.539  0.30( 0.30) 1.00    15660.8   11130.00
    1    25452.36   47.28    1.518  0.30( 0.30) 1.00    15934.1   11220.00
    1    24626.17   58.04    1.388  0.30( 0.30) 1.00    19117.8   10600.00
    1    24472.05   62.61    1.356  0.30( 0.30) 1.00    20494.0   11111.00
    1    24426.00   63.51    1.350  0.30( 0.30) 1.00    20743.9   11201.00
    1    24377.73   64.05    1.346  0.30( 0.30) 1.00    20876.1   11101.00
    1    24189.49   68.76    1.315  0.30( 0.30) 1.00    21886.6   10710.00
    1    24035.41   70.53    1.303  0.30( 0.30) 1.00    22190.8   10410.00
    1    23737.00   74.78    1.275  0.30( 0.30) 1.00    22845.1   10700.00
    1    23339.42   81.49    1.231  0.30( 0.30) 1.00    23811.5   10400.00
    1    23135.85   83.38    1.219  0.30( 0.30) 1.00    24036.7   10200.00
    1    22379.66   88.98    1.182  0.30( 0.30) 1.00    24598.3   10300.00
    1    21536.53   94.23    1.156  0.30( 0.30) 1.00    24819.8   10210.00
    1    19697.32  118.84    1.046  0.30( 0.30) 1.00    25513.0   10100.00
    2      639.65   22.14    2.393  0.30( 0.30) 1.00      339.5   11530.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
    1    21540.85   20.38    2.519  0.30( 0.30) 1.00     6121.9   11500.00
    2    21881.35   22.14    2.393  0.30( 0.30) 1.00     6671.9   11530.00
    3    23058.13   29.16    1.990  0.30( 0.30) 1.00     8762.0   11000.00
    4    25310.49   39.67    1.701  0.30( 0.30) 1.00    13049.3   11330.00
    5    25655.39   41.51    1.657  0.30( 0.30) 1.00    13851.1   10800.00
    6    25720.18   42.10    1.642  0.30( 0.30) 1.00    14133.9   11350.00
    7    25842.51   43.47    1.609  0.30( 0.30) 1.00    14771.1   10900.00
    8    25910.30   45.00    1.573  0.30( 0.30) 1.00    15427.6   11300.00
    9    25955.02   46.38    1.539  0.30( 0.30) 1.00    16000.3   11130.00
   10    25824.47   47.28    1.518  0.30( 0.30) 1.00    16273.6   11220.00
   11    24958.83   58.04    1.388  0.30( 0.30) 1.00    19457.4   10600.00
   12    24794.70   62.61    1.356  0.30( 0.30) 1.00    20833.6   11111.00
   13    24746.84   63.51    1.350  0.30( 0.30) 1.00    21083.4   11201.00
   14    24697.49   64.05    1.346  0.30( 0.30) 1.00    21215.6   11101.00
   15    24499.74   68.76    1.315  0.30( 0.30) 1.00    22226.1   10710.00
```

```
    16    24342.09   70.53    1.303  0.30( 0.30) 1.00   22530.3   10410.00
    17    24035.11   74.78    1.275  0.30( 0.30) 1.00   23184.7   10700.00
    18    23624.00   81.49    1.231  0.30( 0.30) 1.00   24151.1   10400.00
    19    23416.61   83.38    1.219  0.30( 0.30) 1.00   24376.2   10200.00
    20    22649.14   88.98    1.182  0.30( 0.30) 1.00   24937.8   10300.00
    21    21798.17   94.23    1.156  0.30( 0.30) 1.00   25159.4   10210.00
    22    19925.37  118.84    1.046  0.30( 0.30) 1.00   25852.5   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   25955.02    Tc(MIN.) =    46.38
  EFFECTIVE AREA(ACRES) =   16000.33   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    25852.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11540.00 =   74743.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11540.00 TO NODE  11541.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    577.77  DOWNSTREAM(FEET) =    556.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.36   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.39
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.487
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      389.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   26163.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.83
  AVERAGE FLOW DEPTH(FEET) =  11.36   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   48.54
  SUBAREA AREA(ACRES) =   389.46       SUBAREA RUNOFF(CFS) =  416.16
  EFFECTIVE AREA(ACRES) =  16389.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26242.0         PEAK FLOW RATE(CFS) =   25955.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.31   FLOW VELOCITY(FEET/SEC.) =  15.80
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11541.00 =   76797.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11541.00 TO NODE  11542.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.39  DOWNSTREAM(FEET) =    523.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3267.94   CHANNEL SLOPE =  0.0101
```



```
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.46
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.436
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      330.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   26123.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.67
  AVERAGE FLOW DEPTH(FEET) =  11.44   TRAVEL TIME(MIN.) =   3.48
  Tc(MIN.) =   52.01
  SUBAREA AREA(ACRES) =   330.30       SUBAREA RUNOFF(CFS) =  337.74
  EFFECTIVE AREA(ACRES) =  16720.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26572.3         PEAK FLOW RATE(CFS) =   25955.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.40   FLOW VELOCITY(FEET/SEC.) =  15.63
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11542.00 =   80065.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11542.00 TO NODE  11543.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    523.29  DOWNSTREAM(FEET) =    493.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2857.94   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.412
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      285.11      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   26097.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.80
  AVERAGE FLOW DEPTH(FEET) =  11.36   TRAVEL TIME(MIN.) =   3.01
  Tc(MIN.) =   55.03
  SUBAREA AREA(ACRES) =   285.11       SUBAREA RUNOFF(CFS) =  285.43
  EFFECTIVE AREA(ACRES) =  17005.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    26857.4         PEAK FLOW RATE(CFS) =   25955.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.32
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.32   FLOW VELOCITY(FEET/SEC.) =  15.77
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11543.00 =   82923.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11543.00 TO NODE  11544.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    493.61  DOWNSTREAM(FEET) =    480.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1963.01   CHANNEL SLOPE =  0.0068
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.72
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.393
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      303.63      0.30     0.987     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.987
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   26104.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.63
  AVERAGE FLOW DEPTH(FEET) =  12.70   TRAVEL TIME(MIN.) =   2.40
  Tc(MIN.) =   57.43
  SUBAREA AREA(ACRES) =   303.63       SUBAREA RUNOFF(CFS) =  299.85
  EFFECTIVE AREA(ACRES) =  17308.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27161.0         PEAK FLOW RATE(CFS) =   25955.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 12.66   FLOW VELOCITY(FEET/SEC.) =  13.61
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11544.00 =   84886.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11544.00 TO NODE  11545.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    480.21  DOWNSTREAM(FEET) =    456.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1914.49   CHANNEL SLOPE =  0.0122
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.378
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      184.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   26044.38
```



```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.70
  AVERAGE FLOW DEPTH(FEET) =  10.87   TRAVEL TIME(MIN.) =   1.91
  Tc(MIN.) =   59.34
  SUBAREA AREA(ACRES) =   184.16       SUBAREA RUNOFF(CFS) =  178.72
  EFFECTIVE AREA(ACRES) =  17492.99     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27345.2         PEAK FLOW RATE(CFS) =   25955.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.85   FLOW VELOCITY(FEET/SEC.) =  16.69
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11545.00 =   86800.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    456.90  DOWNSTREAM(FEET) =    436.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2322.79   CHANNEL SLOPE =  0.0089
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.82
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.360
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.95      0.30     0.844     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.844
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   26030.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.96
  AVERAGE FLOW DEPTH(FEET) =  11.82   TRAVEL TIME(MIN.) =   2.59
  Tc(MIN.) =   61.93
  SUBAREA AREA(ACRES) =   151.95       SUBAREA RUNOFF(CFS) =  151.41
  EFFECTIVE AREA(ACRES) =  17644.94     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    27497.1         PEAK FLOW RATE(CFS) =   25955.02
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.80   FLOW VELOCITY(FEET/SEC.) =  14.95
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    27497.1  TC(MIN.) =     61.93
  EFFECTIVE AREA(ACRES) =  17644.94  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.997
  PEAK FLOW RATE(CFS)   =   25955.02

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21540.85	36.80	1.775	0.30(0.30)	1.00	7766.5	11500.00
2	21881.35	38.48	1.732	0.30(0.30)	1.00	8316.5	11530.00
3	23058.13	45.25	1.566	0.30(0.30)	1.00	10406.6	11000.00
4	25310.49	55.34	1.410	0.30(0.30)	1.00	14693.9	11330.00
5	25655.39	57.11	1.396	0.30(0.30)	1.00	15495.7	10800.00
6	25720.18	57.69	1.391	0.30(0.30)	1.00	15778.5	11350.00
7	25842.51	59.04	1.381	0.30(0.30)	1.00	16415.7	10900.00
8	25910.30	60.56	1.369	0.30(0.30)	1.00	17072.2	11300.00
9	25955.02	61.93	1.360	0.30(0.30)	1.00	17644.9	11130.00
10	25824.47	62.85	1.354	0.30(0.30)	1.00	17918.2	11220.00
11	24958.83	73.77	1.282	0.30(0.30)	1.00	21102.0	10600.00
12	24794.70	78.38	1.252	0.30(0.30)	1.00	22478.2	11111.00
13	24746.84	79.28	1.246	0.30(0.30)	1.00	22728.0	11201.00
14	24697.49	79.83	1.242	0.30(0.30)	1.00	22860.2	11101.00
15	24499.74	84.59	1.211	0.30(0.30)	1.00	23870.8	10710.00
16	24342.09	86.38	1.199	0.30(0.30)	1.00	24174.9	10410.00
17	24035.11	90.69	1.172	0.30(0.30)	1.00	24829.3	10700.00
18	23624.00	97.48	1.142	0.30(0.30)	1.00	25795.7	10400.00
19	23416.61	99.42	1.133	0.30(0.30)	1.00	26020.8	10200.00
20	22649.14	105.18	1.107	0.30(0.30)	1.00	26582.4	10300.00
21	21798.17	110.61	1.083	0.30(0.30)	1.00	26804.0	10210.00
22	19925.37	135.67	0.999	0.30(0.30)	1.00	27497.1	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S16.DAT
  TIME/DATE OF STUDY: 09:58 04/01/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.507
   2)   10.00;  4.101
   3)   15.00;  3.134
   4)   20.00;  2.547
   5)   25.00;  2.187
   6)   30.00;  1.950
   7)   40.00;  1.693
   8)   50.00;  1.452
   9)   60.00;  1.373
  10)   90.00;  1.175
  11)  120.00;  1.041
  12)  180.00;  0.882
  13)  360.00;  0.668
  14) 1440.00;  0.297
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11600.00 TO NODE  11601.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.21
  ELEVATION DATA: UPSTREAM(FEET) =   3061.08  DOWNSTREAM(FEET) =   2962.88

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.120
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.078
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        1.79      0.30     1.000     0   10.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.09
  TOTAL AREA(ACRES) =      1.79   PEAK FLOW RATE(CFS) =      6.09

**************************************************************************
  FLOW PROCESS FROM NODE  11601.00 TO NODE  11602.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2962.88  DOWNSTREAM(FEET) =   2839.39
  CHANNEL LENGTH THRU SUBAREA(FEET) =   548.33   CHANNEL SLOPE =  0.2252
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.705
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.88      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.74
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   12.05
  SUBAREA AREA(ACRES) =     4.88       SUBAREA RUNOFF(CFS) =   14.96
  EFFECTIVE AREA(ACRES) =      6.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =      20.44
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   5.52
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11602.00 =     938.54 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11602.00 TO NODE  11603.00 IS CODE =  56
```

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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2839.39  DOWNSTREAM(FEET) =   2697.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.87   CHANNEL SLOPE =  0.1452
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.264
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       31.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.14
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =   14.33
  SUBAREA AREA(ACRES) =    31.42       SUBAREA RUNOFF(CFS) =   83.82
  EFFECTIVE AREA(ACRES) =     38.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.1         PEAK FLOW RATE(CFS) =     101.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.01   FLOW VELOCITY(FEET/SEC.) =   8.37
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11603.00 =    1915.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11603.00 TO NODE  11604.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2697.55  DOWNSTREAM(FEET) =   2598.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1887.15   CHANNEL SLOPE =  0.0523
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.96
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.689
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       72.03      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     179.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.05
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   4.46
  Tc(MIN.) =   18.79
  SUBAREA AREA(ACRES) =    72.03       SUBAREA RUNOFF(CFS) =  154.90
  EFFECTIVE AREA(ACRES) =    110.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =     236.81
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.16   FLOW VELOCITY(FEET/SEC.) =   7.65
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11604.00 =    3802.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11604.00 TO NODE  11605.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2598.90  DOWNSTREAM(FEET) =   2464.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2488.89   CHANNEL SLOPE =  0.0541
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.60
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.282
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     322.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.48
  AVERAGE FLOW DEPTH(FEET) =   2.53   TRAVEL TIME(MIN.) =   4.89
  Tc(MIN.) =   23.68
  SUBAREA AREA(ACRES) =    96.28       SUBAREA RUNOFF(CFS) =  171.77
  EFFECTIVE AREA(ACRES) =    206.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      206.4         PEAK FLOW RATE(CFS) =     368.24
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.71   FLOW VELOCITY(FEET/SEC.) =   8.81
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11605.00 =    6291.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11605.00 TO NODE  11606.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2464.25  DOWNSTREAM(FEET) =   2359.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1936.71   CHANNEL SLOPE =  0.0538
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.097
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      266.26      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     583.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.00
  AVERAGE FLOW DEPTH(FEET) =   3.45   TRAVEL TIME(MIN.) =   3.23
  Tc(MIN.) =   26.91
  SUBAREA AREA(ACRES) =   266.26       SUBAREA RUNOFF(CFS) =  430.56
  EFFECTIVE AREA(ACRES) =    472.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      472.7          PEAK FLOW RATE(CFS) =     764.33
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.96   FLOW VELOCITY(FEET/SEC.) =  10.76
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11606.00 =    8228.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11606.00 TO NODE  11607.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2359.99  DOWNSTREAM(FEET) =   1905.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3829.49   CHANNEL SLOPE =  0.1188
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.46
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.919
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     860.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.84
  AVERAGE FLOW DEPTH(FEET) =   3.44   TRAVEL TIME(MIN.) =   4.30
  Tc(MIN.) =   31.21
  SUBAREA AREA(ACRES) =   132.44       SUBAREA RUNOFF(CFS) =  192.98
  EFFECTIVE AREA(ACRES) =    605.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      605.1          PEAK FLOW RATE(CFS) =     881.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.48   FLOW VELOCITY(FEET/SEC.) =  14.92
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11607.00 =   12057.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11607.00 TO NODE  11608.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   1905.15  DOWNSTREAM(FEET) =   1717.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1095.02   CHANNEL SLOPE =  0.1710
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.892
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       76.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     936.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.32
  AVERAGE FLOW DEPTH(FEET) =   3.27   TRAVEL TIME(MIN.) =   1.05
  Tc(MIN.) =   32.26
  SUBAREA AREA(ACRES) =    76.91       SUBAREA RUNOFF(CFS) =  110.19
  EFFECTIVE AREA(ACRES) =    682.01     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      682.0          PEAK FLOW RATE(CFS) =     977.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.34   FLOW VELOCITY(FEET/SEC.) =  17.51
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11608.00 =   13152.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11608.00 TO NODE  11609.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1717.92  DOWNSTREAM(FEET) =   1516.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1480.24   CHANNEL SLOPE =  0.1362
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.96
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.855
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1207.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.08
  AVERAGE FLOW DEPTH(FEET) =   3.95   TRAVEL TIME(MIN.) =   1.44
  Tc(MIN.) =   33.71
  SUBAREA AREA(ACRES) =   328.91       SUBAREA RUNOFF(CFS) =  460.26
  EFFECTIVE AREA(ACRES) =   1010.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1010.9          PEAK FLOW RATE(CFS) =    1414.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.28
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.28   FLOW VELOCITY(FEET/SEC.) =  17.84
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11609.00 =   14632.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11609.00 TO NODE  11610.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1516.24  DOWNSTREAM(FEET) =   1332.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.38   CHANNEL SLOPE =  0.0957
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.06
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.804
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      355.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1655.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.33
  AVERAGE FLOW DEPTH(FEET) =   5.05   TRAVEL TIME(MIN.) =   1.97
  Tc(MIN.) =   35.67
  SUBAREA AREA(ACRES) =   355.16       SUBAREA RUNOFF(CFS) =  480.85
  EFFECTIVE AREA(ACRES) =   1366.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1366.1          PEAK FLOW RATE(CFS) =    1849.53
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.33   FLOW VELOCITY(FEET/SEC.) =  16.80
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11610.00 =   16558.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11610.00 TO NODE  11611.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1332.01  DOWNSTREAM(FEET) =   1105.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2901.03   CHANNEL SLOPE =  0.0781
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.82
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.726
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      234.59      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2000.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.93
```



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  AVERAGE FLOW DEPTH(FEET) =   5.81   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   38.71
  SUBAREA AREA(ACRES) =   234.59       SUBAREA RUNOFF(CFS) =  301.14
  EFFECTIVE AREA(ACRES) =   1600.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1600.7          PEAK FLOW RATE(CFS) =    2054.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.89   FLOW VELOCITY(FEET/SEC.) =  16.04
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11611.00 =   19459.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11611.00 TO NODE  11612.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.34  DOWNSTREAM(FEET) =   1030.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1982.46   CHANNEL SLOPE =  0.0378
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.660
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2184.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.44
  AVERAGE FLOW DEPTH(FEET) =   7.20   TRAVEL TIME(MIN.) =   2.66
  Tc(MIN.) =   41.36
  SUBAREA AREA(ACRES) =   212.67       SUBAREA RUNOFF(CFS) =  260.36
  EFFECTIVE AREA(ACRES) =   1813.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1813.3          PEAK FLOW RATE(CFS) =    2219.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.25   FLOW VELOCITY(FEET/SEC.) =  12.50
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11612.00 =   21441.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1030.47  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3051.86   CHANNEL SLOPE =  0.0525
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.10
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.576
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      465.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2487.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.55
  AVERAGE FLOW DEPTH(FEET) =   7.08   TRAVEL TIME(MIN.) =   3.50
  Tc(MIN.) =   44.86
  SUBAREA AREA(ACRES) =   465.36       SUBAREA RUNOFF(CFS) =  534.42
  EFFECTIVE AREA(ACRES) =   2278.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2278.7         PEAK FLOW RATE(CFS) =    2616.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.25   FLOW VELOCITY(FEET/SEC.) =  14.75
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11612.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   44.86
  RAINFALL INTENSITY(INCH/HR) =   1.58
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    2278.70
  TOTAL STREAM AREA(ACRES) =    2278.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    2616.87

****************************************************************************
  FLOW PROCESS FROM NODE  11620.00 TO NODE  11621.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   266.64
  ELEVATION DATA: UPSTREAM(FEET) =   2567.03  DOWNSTREAM(FEET) =   2486.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.387
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.877
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        0.69      0.30     1.000     0    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.84
  TOTAL AREA(ACRES) =      0.69   PEAK FLOW RATE(CFS) =      2.84

****************************************************************************
  FLOW PROCESS FROM NODE  11621.00 TO NODE  11622.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2486.90  DOWNSTREAM(FEET) =   2424.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   712.48   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.633
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        3.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.94
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   4.03
  Tc(MIN.) =   12.42
  SUBAREA AREA(ACRES) =     3.63       SUBAREA RUNOFF(CFS) =   10.89
  EFFECTIVE AREA(ACRES) =      4.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.3         PEAK FLOW RATE(CFS) =      12.96
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   3.48
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11622.00 =     979.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11622.00 TO NODE  11623.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2424.91  DOWNSTREAM(FEET) =   2351.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   977.46   CHANNEL SLOPE =  0.0751
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.64
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.006
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.44
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   3.67
  Tc(MIN.) =   16.09
  SUBAREA AREA(ACRES) =    13.42       SUBAREA RUNOFF(CFS) =   32.68
  EFFECTIVE AREA(ACRES) =     17.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       17.7         PEAK FLOW RATE(CFS) =      43.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   5.05
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11623.00 =    1956.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11623.00 TO NODE  11624.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2351.48  DOWNSTREAM(FEET) =   2317.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.96   CHANNEL SLOPE =  0.0355
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.15
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.581
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.37
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   3.62
  Tc(MIN.) =   19.71
  SUBAREA AREA(ACRES) =    16.02       SUBAREA RUNOFF(CFS) =   32.89
  EFFECTIVE AREA(ACRES) =     33.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.8         PEAK FLOW RATE(CFS) =      69.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOW VELOCITY(FEET/SEC.) =   4.59
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.00 =    2904.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.00 TO NODE  11624.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2317.87  DOWNSTREAM(FEET) =   2292.33
  CHANNEL LENGTH THRU SUBAREA(FEET) =   758.23   CHANNEL SLOPE =  0.0337
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.54
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.389
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.93      0.30     0.984     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     100.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.08
  AVERAGE FLOW DEPTH(FEET) =   1.52   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   22.20
  SUBAREA AREA(ACRES) =    32.93       SUBAREA RUNOFF(CFS) =   62.05
  EFFECTIVE AREA(ACRES) =     66.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =     125.53
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.72   FLOW VELOCITY(FEET/SEC.) =   5.43
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11624.50 =    3662.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11624.50 TO NODE  11625.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2292.33  DOWNSTREAM(FEET) =   2256.59
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1098.98   CHANNEL SLOPE =  0.0325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.06
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.171
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       48.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     166.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.83
  AVERAGE FLOW DEPTH(FEET) =   2.03   TRAVEL TIME(MIN.) =   3.14
  Tc(MIN.) =   25.34
  SUBAREA AREA(ACRES) =    48.16       SUBAREA RUNOFF(CFS) =   81.10
  EFFECTIVE AREA(ACRES) =    114.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.9         PEAK FLOW RATE(CFS) =     193.55
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.20   FLOW VELOCITY(FEET/SEC.) =   6.10
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11625.00 =    4761.75 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11625.00 TO NODE  11626.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2256.59  DOWNSTREAM(FEET) =   2104.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.93   CHANNEL SLOPE =  0.0739
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.004
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      212.15      0.30     0.950     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.950
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     357.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.75
  AVERAGE FLOW DEPTH(FEET) =   2.46   TRAVEL TIME(MIN.) =   3.51
  Tc(MIN.) =   28.85
  SUBAREA AREA(ACRES) =   212.15       SUBAREA RUNOFF(CFS) =  328.32
  EFFECTIVE AREA(ACRES) =    327.00     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      327.0         PEAK FLOW RATE(CFS) =     504.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.95   FLOW VELOCITY(FEET/SEC.) =  10.76
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11626.00 =    6818.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11626.00 TO NODE  11627.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2104.66  DOWNSTREAM(FEET) =   1837.03
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2716.08   CHANNEL SLOPE =  0.0985
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.04
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.887
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      147.74      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     610.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.61
  AVERAGE FLOW DEPTH(FEET) =   3.02   TRAVEL TIME(MIN.) =   3.59
  Tc(MIN.) =   32.44
  SUBAREA AREA(ACRES) =   147.74       SUBAREA RUNOFF(CFS) =  211.06
  EFFECTIVE AREA(ACRES) =    474.74     AREA-AVERAGED Fm(INCH/HR) =   0.29
```



```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      474.7         PEAK FLOW RATE(CFS) =     681.21
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.20   FLOW VELOCITY(FEET/SEC.) =  12.98
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11627.00 =    9534.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11627.00 TO NODE  11628.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1837.03  DOWNSTREAM(FEET) =   1393.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2077.86   CHANNEL SLOPE =  0.2132
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.838
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      202.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     821.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.09
  AVERAGE FLOW DEPTH(FEET) =   2.88   TRAVEL TIME(MIN.) =   1.91
  Tc(MIN.) =   34.36
  SUBAREA AREA(ACRES) =   202.44       SUBAREA RUNOFF(CFS) =  280.24
  EFFECTIVE AREA(ACRES) =    677.18     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      677.2         PEAK FLOW RATE(CFS) =     940.42
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.09   FLOW VELOCITY(FEET/SEC.) =  18.77
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11628.00 =   11612.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11628.00 TO NODE  11629.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1393.93  DOWNSTREAM(FEET) =   1201.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2844.34   CHANNEL SLOPE =  0.0676
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.742
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      141.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1032.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.68
  AVERAGE FLOW DEPTH(FEET) =   4.35   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   38.09
  SUBAREA AREA(ACRES) =   141.55       SUBAREA RUNOFF(CFS) =  183.71
  EFFECTIVE AREA(ACRES) =    818.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      818.7         PEAK FLOW RATE(CFS) =    1065.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.42   FLOW VELOCITY(FEET/SEC.) =  12.79
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11629.00 =   14456.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1201.61  DOWNSTREAM(FEET) =    870.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3807.89   CHANNEL SLOPE =  0.0870
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.632
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      106.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1129.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.24
  AVERAGE FLOW DEPTH(FEET) =   4.28   TRAVEL TIME(MIN.) =   4.46
  Tc(MIN.) =   42.55
  SUBAREA AREA(ACRES) =   106.41       SUBAREA RUNOFF(CFS) =  127.53
  EFFECTIVE AREA(ACRES) =    925.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      925.1         PEAK FLOW RATE(CFS) =    1111.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.24   FLOW VELOCITY(FEET/SEC.) =  14.19
  LONGEST FLOWPATH FROM NODE  11620.00 TO NODE  11630.00 =   18264.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11629.00 TO NODE  11630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   42.55
  RAINFALL INTENSITY(INCH/HR) =   1.63
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     925.14
  TOTAL STREAM AREA(ACRES) =     925.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1111.72

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2616.87   44.86    1.576  0.30( 0.30) 1.00    2278.7   11600.00
      2     1111.72   42.55    1.632  0.30( 0.30) 0.99     925.1   11620.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3702.17   42.55    1.632  0.30( 0.30) 1.00    3086.7   11620.00
      2     3682.31   44.86    1.576  0.30( 0.30) 1.00    3203.8   11600.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    3702.17    Tc(MIN.) =    42.55
  EFFECTIVE AREA(ACRES) =    3086.67   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3203.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11630.00 =   24493.64 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3203.8  TC(MIN.) =     42.55
  EFFECTIVE AREA(ACRES) =   3086.67  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.996
  PEAK FLOW RATE(CFS)   =    3702.17

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3702.17   42.55    1.632  0.30( 0.30) 1.00    3086.7   11620.00
      2     3682.31   44.86    1.576  0.30( 0.30) 1.00    3203.8   11600.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                        Analysis prepared by:
```

FILE NAME: S17.DAT
TIME/DATE OF STUDY: 09:58 04/01/2013

==========

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

==========

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
USER-DEFINED TABLED RAINFALL USED
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	6.507
2)	10.00;	4.101
3)	15.00;	3.134
4)	20.00;	2.547
5)	25.00;	2.187
6)	30.00;	1.950
7)	40.00;	1.693
8)	50.00;	1.452
9)	60.00;	1.373
10)	90.00;	1.175
11)	120.00;	1.041
12)	180.00;	0.882
13)	360.00;	0.668
14)	1440.00;	0.297

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****

FLOW PROCESS FROM NODE 11701.00 TO NODE 11702.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

==========

INITIAL SUBAREA FLOW-LENGTH(FEET) = 291.79
ELEVATION DATA: UPSTREAM(FEET) = 1581.05 DOWNSTREAM(FEET) = 1496.25

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.753
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.701
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	2.72	0.30	1.000	0	8.75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 10.77
TOTAL AREA(ACRES) = 2.72 PEAK FLOW RATE(CFS) = 10.77

****

FLOW PROCESS FROM NODE 11702.00 TO NODE 11703.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 1496.25 DOWNSTREAM(FEET) = 1254.33
CHANNEL LENGTH THRU SUBAREA(FEET) = 563.54 CHANNEL SLOPE = 0.4293
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.36
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.108
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	10.12	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.21
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.62
AVERAGE FLOW DEPTH(FEET) = 0.35 TRAVEL TIME(MIN.) = 1.23
Tc(MIN.) = 9.99
SUBAREA AREA(ACRES) = 10.12 SUBAREA RUNOFF(CFS) = 34.68
EFFECTIVE AREA(ACRES) = 12.84 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 12.8 PEAK FLOW RATE(CFS) = 44.01
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.45 FLOW VELOCITY(FEET/SEC.) = 8.91
LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11703.00 = 855.33 FEET.

****

FLOW PROCESS FROM NODE 11703.00 TO NODE 11704.00 IS CODE = 56

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1254.33  DOWNSTREAM(FEET) =   1143.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.91   CHANNEL SLOPE =  0.1076
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.624
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.89
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   2.48
  Tc(MIN.) =   12.47
  SUBAREA AREA(ACRES) =    21.52       SUBAREA RUNOFF(CFS) =   64.37
  EFFECTIVE AREA(ACRES) =     34.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.4         PEAK FLOW RATE(CFS) =     102.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.11   FLOW VELOCITY(FEET/SEC.) =   7.58
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11704.00 =    1881.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11704.00 TO NODE  11705.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1143.91  DOWNSTREAM(FEET) =    804.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1952.20   CHANNEL SLOPE =  0.1737
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.064
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     165.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.39
  AVERAGE FLOW DEPTH(FEET) =   1.27   TRAVEL TIME(MIN.) =   3.13
  Tc(MIN.) =   15.60
  SUBAREA AREA(ACRES) =    50.19       SUBAREA RUNOFF(CFS) =  124.84
  EFFECTIVE AREA(ACRES) =     84.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       84.6         PEAK FLOW RATE(CFS) =     210.30
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =  11.22
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11705.00 =    3833.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    804.90  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1056.71   CHANNEL SLOPE =  0.0753
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.823
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     228.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.61
  AVERAGE FLOW DEPTH(FEET) =   1.92   TRAVEL TIME(MIN.) =   2.05
  Tc(MIN.) =   17.65
  SUBAREA AREA(ACRES) =    15.89       SUBAREA RUNOFF(CFS) =   36.09
  EFFECTIVE AREA(ACRES) =    100.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.4         PEAK FLOW RATE(CFS) =     228.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.92   FLOW VELOCITY(FEET/SEC.) =   8.60
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S16.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     3702.17   42.55  0.30( 0.30) 1.00    3086.7   11620.00
```

```
      2     3682.31   44.86  0.30( 0.30) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =     3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11630.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)         (ACRES)    NODE
      1     3702.17   42.55  0.30( 0.30) 1.00    3086.7   11620.00
      2     3682.31   44.86  0.30( 0.30) 1.00    3203.8   11600.00
    TOTAL AREA(ACRES) =      3203.8

****************************************************************************
  FLOW PROCESS FROM NODE  11630.00 TO NODE  11721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.22  DOWNSTREAM(FEET) =    725.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3507.54   CHANNEL SLOPE =  0.0413
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.537
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      213.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3821.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.85
  AVERAGE FLOW DEPTH(FEET) =   9.11   TRAVEL TIME(MIN.) =   3.94
  Tc(MIN.) =   46.49
  SUBAREA AREA(ACRES) =   213.50       SUBAREA RUNOFF(CFS) =  237.64
  EFFECTIVE AREA(ACRES) =   3300.17     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3417.3         PEAK FLOW RATE(CFS) =    3702.17
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.98   FLOW VELOCITY(FEET/SEC.) =  14.73
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11705.00 TO NODE  11721.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
```



```
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3702.17   46.49    1.537  0.30( 0.30) 1.00    3300.2   11620.00
      2     3682.31   48.80    1.481  0.30( 0.30) 1.00    3417.3   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      228.10   17.65    2.823  0.30( 0.30) 1.00     100.4   11701.00
  LONGEST FLOWPATH FROM NODE  11701.00 TO NODE  11721.00 =    4890.15 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     3094.31   17.65    2.823  0.30( 0.30) 1.00    1353.2   11701.00
      2     3813.97   46.49    1.537  0.30( 0.30) 1.00    3400.6   11620.00
      3     3789.07   48.80    1.481  0.30( 0.30) 1.00    3517.8   11600.00
    TOTAL AREA(ACRES) =      3517.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3813.97  Tc(MIN.) =   46.487
  EFFECTIVE AREA(ACRES) =   3400.61  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     3517.8
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11721.00 =   28001.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11721.00 TO NODE  11722.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    725.34  DOWNSTREAM(FEET) =    657.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1845.27   CHANNEL SLOPE =  0.0367
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.462
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      185.10      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3910.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.98
  AVERAGE FLOW DEPTH(FEET) =   3.45   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   49.57
  SUBAREA AREA(ACRES) =   185.10       SUBAREA RUNOFF(CFS) =  193.65
  EFFECTIVE AREA(ACRES) =   3585.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3702.9         PEAK FLOW RATE(CFS) =    3813.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.39
```

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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.39   FLOW VELOCITY(FEET/SEC.) =   9.90
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11722.00 =   29846.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11722.00 TO NODE  11723.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.70  DOWNSTREAM(FEET) =    609.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1967.44   CHANNEL SLOPE =  0.0245
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.426
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      273.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3952.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.78
  AVERAGE FLOW DEPTH(FEET) =   3.90   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   53.31
  SUBAREA AREA(ACRES) =   273.16       SUBAREA RUNOFF(CFS) =  276.81
  EFFECTIVE AREA(ACRES) =   3858.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3976.0         PEAK FLOW RATE(CFS) =    3913.42
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.87   FLOW VELOCITY(FEET/SEC.) =   8.75
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11723.00 =   31813.89 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3094.31   24.89    2.195  0.30( 0.30) 1.00    1811.4   11701.00
      2     3913.42   53.31    1.426  0.30( 0.30) 1.00    3858.9   11620.00
      3     3966.31   55.63    1.407  0.30( 0.30) 1.00    3976.0   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3966.31  Tc(MIN.) =   55.63
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3976.04

****************************************************************************
  FLOW PROCESS FROM NODE  11723.00 TO NODE  11724.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    609.57  DOWNSTREAM(FEET) =    546.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2808.53   CHANNEL SLOPE =  0.0224
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
```



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  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.05
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.366
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      159.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4042.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.58
  AVERAGE FLOW DEPTH(FEET) =   4.05   TRAVEL TIME(MIN.) =   5.45
  Tc(MIN.) =   61.09
  SUBAREA AREA(ACRES) =   159.72       SUBAREA RUNOFF(CFS) =  153.22
  EFFECTIVE AREA(ACRES) =   4135.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4135.8         PEAK FLOW RATE(CFS) =    3970.39
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.01   FLOW VELOCITY(FEET/SEC.) =   8.53
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11724.00 =   34622.42 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3094.31   30.79    1.930  0.30( 0.30) 1.00    1971.2   11701.00
      2     3918.74   58.78    1.383  0.30( 0.30) 1.00    4018.6   11620.00
      3     3970.39   61.09    1.366  0.30( 0.30) 1.00    4135.8   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3970.39  Tc(MIN.) =   61.09
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    4135.76

****************************************************************************
  FLOW PROCESS FROM NODE  11724.00 TO NODE  11725.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    546.77  DOWNSTREAM(FEET) =    483.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2921.33   CHANNEL SLOPE =  0.0216
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.09
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.328
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.67      0.30     0.917     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4034.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.49
  AVERAGE FLOW DEPTH(FEET) =   4.09   TRAVEL TIME(MIN.) =   5.74
  Tc(MIN.) =   66.83
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  SUBAREA AREA(ACRES) =   134.67       SUBAREA RUNOFF(CFS) =  127.61
  EFFECTIVE AREA(ACRES) =   4270.43     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4270.4         PEAK FLOW RATE(CFS) =    3970.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.05   FLOW VELOCITY(FEET/SEC.) =   8.43
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11725.00 =   37543.75 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3094.31   37.02    1.770  0.30( 0.30) 0.99    2105.8   11701.00
      2     3918.74   64.56    1.343  0.30( 0.30) 0.99    4153.3   11620.00
      3     3970.39   66.83    1.328  0.30( 0.30) 0.99    4270.4   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3970.39  Tc(MIN.) =   66.83
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4270.43

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    483.75  DOWNSTREAM(FEET) =    436.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2685.66   CHANNEL SLOPE =  0.0177
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.291
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      121.44      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4024.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.94
  AVERAGE FLOW DEPTH(FEET) =   4.32   TRAVEL TIME(MIN.) =   5.64
  Tc(MIN.) =   72.47
  SUBAREA AREA(ACRES) =   121.44       SUBAREA RUNOFF(CFS) =  108.75
  EFFECTIVE AREA(ACRES) =   4391.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     4391.9         PEAK FLOW RATE(CFS) =    3970.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.29   FLOW VELOCITY(FEET/SEC.) =   7.90
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3094.31   43.14    1.617  0.30( 0.30) 0.99    2227.3   11701.00
      2     3918.74   70.22    1.306  0.30( 0.30) 0.99    4274.7   11620.00
      3     3970.39   72.47    1.291  0.30( 0.30) 0.99    4391.9   11600.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3970.39  Tc(MIN.) =   72.47
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    4391.87
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     4391.9  TC(MIN.) =     72.47
  EFFECTIVE AREA(ACRES) =   4391.87  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.995
  PEAK FLOW RATE(CFS)   =    3970.39

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3094.31   43.14    1.617  0.30( 0.30) 0.99    2227.3   11701.00
      2     3918.74   70.22    1.306  0.30( 0.30) 0.99    4274.7   11620.00
      3     3970.39   72.47    1.291  0.30( 0.30) 0.99    4391.9   11600.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:
```

```
--------------------------------------------------------------------------
  FILE NAME: S18.DAT
  TIME/DATE OF STUDY: 11:52 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.454
   2)   10.00;  4.074
   3)   15.00;  3.117
   4)   20.00;  2.536
   5)   25.00;  2.180
   6)   30.00;  1.944
   7)   40.00;  1.686
   8)   50.00;  1.448
   9)   60.00;  1.366
  10)   90.00;  1.168
  11)  120.00;  1.033
  12)  180.00;  0.874
  13)  360.00;  0.661
  14) 1440.00;  0.294
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11801.00 TO NODE  11802.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   970.31
  ELEVATION DATA: UPSTREAM(FEET) =    834.89  DOWNSTREAM(FEET) =    727.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.170
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.865
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        7.24      0.30     1.000     0   17.17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     16.71
  TOTAL AREA(ACRES) =      7.24   PEAK FLOW RATE(CFS) =     16.71

**************************************************************************
  FLOW PROCESS FROM NODE  11802.00 TO NODE  11803.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    727.50  DOWNSTREAM(FEET) =    674.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   968.10   CHANNEL SLOPE =  0.0551
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.476
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       22.08      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.39
  AVERAGE FLOW DEPTH(FEET) =   0.76   TRAVEL TIME(MIN.) =   3.68
  Tc(MIN.) =   20.85
  SUBAREA AREA(ACRES) =    22.08       SUBAREA RUNOFF(CFS) =   43.24
  EFFECTIVE AREA(ACRES) =     29.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3          PEAK FLOW RATE(CFS) =      57.41
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   5.03
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11803.00 =    1938.41 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  11803.00 TO NODE  11804.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    674.12  DOWNSTREAM(FEET) =    554.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1864.27   CHANNEL SLOPE =  0.0642
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.133
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.55      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      86.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.05
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   5.14
  Tc(MIN.) =   25.99
  SUBAREA AREA(ACRES) =    35.55       SUBAREA RUNOFF(CFS) =   58.66
  EFFECTIVE AREA(ACRES) =     64.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       64.9         PEAK FLOW RATE(CFS) =     107.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.32   FLOW VELOCITY(FEET/SEC.) =   6.44
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11804.00 =    3802.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    554.40  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1767.25   CHANNEL SLOPE =  0.0738
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.943
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       36.70      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     134.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.29
  AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   4.04
  Tc(MIN.) =   30.03
  SUBAREA AREA(ACRES) =    36.70       SUBAREA RUNOFF(CFS) =   54.28
  EFFECTIVE AREA(ACRES) =    101.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      101.6         PEAK FLOW RATE(CFS) =     150.22
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.53   FLOW VELOCITY(FEET/SEC.) =   7.53
  LONGEST FLOWPATH FROM NODE  11801.00 TO NODE  11821.00 =    5569.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11804.00 TO NODE  11821.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S15.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    21540.85   36.80  0.30( 0.30) 1.00    7766.5   11500.00
      2    21881.35   38.48  0.30( 0.30) 1.00    8316.5   11530.00
      3    23058.13   45.25  0.30( 0.30) 1.00   10406.6   11000.00
      4    25310.49   55.34  0.30( 0.30) 1.00   14693.9   11330.00
      5    25720.18   57.69  0.30( 0.30) 1.00   15778.5   11350.00
      6    25842.51   59.04  0.30( 0.30) 1.00   16415.7   10900.00
      7    25910.30   60.56  0.30( 0.30) 1.00   17072.2   11300.00
      8    25955.02   61.93  0.30( 0.30) 1.00   17644.9   11130.00
      9    24958.83   73.77  0.30( 0.30) 1.00   21102.0   10600.00
     10    24794.70   78.38  0.30( 0.30) 1.00   22478.2   11111.00
     11    24746.84   79.28  0.30( 0.30) 1.00   22728.0   11201.00
     12    24697.49   79.83  0.30( 0.30) 1.00   22860.2   11101.00
     13    24499.74   84.59  0.30( 0.30) 1.00   23870.8   10710.00
     14    24342.09   86.38  0.30( 0.30) 1.00   24174.9   10410.00
     15    24035.11   90.69  0.30( 0.30) 1.00   24829.3   10700.00
     16    23624.00   97.48  0.30( 0.30) 1.00   25795.7   10400.00
     17    23416.61   99.42  0.30( 0.30) 1.00   26020.8   10200.00
     18    22649.14  105.18  0.30( 0.30) 1.00   26582.4   10300.00
     19    21798.17  110.61  0.30( 0.30) 1.00   26804.0   10210.00
     20    19925.37  135.67  0.30( 0.30) 1.00   27497.1   10100.00
    TOTAL AREA(ACRES) =    27497.1

****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S17.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     3094.31   43.14  0.30( 0.30) 0.99    2227.3   11701.00
      2     3918.74   70.22  0.30( 0.30) 0.99    4274.7   11620.00
      3     3970.39   72.47  0.30( 0.30) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =     4391.9
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  11725.00 TO NODE  11726.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     3094.31   43.14  0.30( 0.30) 0.99    2227.3   11701.00
      2     3918.74   70.22  0.30( 0.30) 0.99    4274.7   11620.00
      3     3970.39   72.47  0.30( 0.30) 0.99    4391.9   11600.00
    TOTAL AREA(ACRES) =      4391.9

****************************************************************************
  FLOW PROCESS FROM NODE  11545.00 TO NODE  11726.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3094.31   43.14    1.611  0.30( 0.30) 0.99    2227.3   11701.00
      2     3918.74   70.22    1.299  0.30( 0.30) 0.99    4274.7   11620.00
      3     3970.39   72.47    1.284  0.30( 0.30) 0.99    4391.9   11600.00
  LONGEST FLOWPATH FROM NODE  11600.00 TO NODE  11726.00 =   40229.41 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    21540.85   36.80    1.769  0.30( 0.30) 1.00    7766.5   11500.00
      2    21881.35   38.48    1.725  0.30( 0.30) 1.00    8316.5   11530.00
      3    23058.13   45.25    1.561  0.30( 0.30) 1.00   10406.6   11000.00
      4    25310.49   55.34    1.404  0.30( 0.30) 1.00   14693.9   11330.00
      5    25720.18   57.69    1.385  0.30( 0.30) 1.00   15778.5   11350.00
      6    25842.51   59.04    1.374  0.30( 0.30) 1.00   16415.7   10900.00
      7    25910.30   60.56    1.362  0.30( 0.30) 1.00   17072.2   11300.00
      8    25955.02   61.93    1.353  0.30( 0.30) 1.00   17644.9   11130.00
      9    24958.83   73.77    1.275  0.30( 0.30) 1.00   21102.0   10600.00
     10    24794.70   78.38    1.245  0.30( 0.30) 1.00   22478.2   11111.00
     11    24746.84   79.28    1.239  0.30( 0.30) 1.00   22728.0   11201.00
     12    24697.49   79.83    1.235  0.30( 0.30) 1.00   22860.2   11101.00
     13    24499.74   84.59    1.204  0.30( 0.30) 1.00   23870.8   10710.00
     14    24342.09   86.38    1.192  0.30( 0.30) 1.00   24174.9   10410.00
     15    24035.11   90.69    1.165  0.30( 0.30) 1.00   24829.3   10700.00
     16    23624.00   97.48    1.134  0.30( 0.30) 1.00   25795.7   10400.00
     17    23416.61   99.42    1.126  0.30( 0.30) 1.00   26020.8   10200.00
     18    22649.14  105.18    1.100  0.30( 0.30) 1.00   26582.4   10300.00
     19    21798.17  110.61    1.075  0.30( 0.30) 1.00   26804.0   10210.00
     20    19925.37  135.67    0.991  0.30( 0.30) 1.00   27497.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24496.28   36.80    1.769  0.30( 0.30) 0.99    9666.0   11500.00
```



```
      2    24880.71   38.48    1.725  0.30( 0.30) 0.99   10302.9   11530.00
      3    25786.43   43.14    1.611  0.30( 0.30) 1.00   11983.8   11701.00
      4    26216.58   45.25    1.561  0.30( 0.30) 1.00   12793.1   11000.00
      5    28776.01   55.34    1.404  0.30( 0.30) 1.00   17843.1   11330.00
      6    29257.29   57.69    1.385  0.30( 0.30) 1.00   19105.4   11350.00
      7    29420.93   59.04    1.374  0.30( 0.30) 1.00   19845.2   10900.00
      8    29534.78   60.56    1.362  0.30( 0.30) 1.00   20616.1   11300.00
      9    29621.25   61.93    1.353  0.30( 0.30) 1.00   21292.5   11130.00
     10    29176.31   70.22    1.299  0.30( 0.30) 1.00   24340.0   11620.00
     11    29039.00   72.47    1.284  0.30( 0.30) 1.00   25112.9   11600.00
     12    28894.51   73.77    1.275  0.30( 0.30) 1.00   25493.9   10600.00
     13    28607.87   78.38    1.245  0.30( 0.30) 1.00   26870.0   11111.00
     14    28535.95   79.28    1.239  0.30( 0.30) 1.00   27119.9   11201.00
     15    28472.14   79.83    1.235  0.30( 0.30) 1.00   27252.1   11101.00
     16    28147.84   84.59    1.204  0.30( 0.30) 1.00   28262.6   10710.00
     17    27942.40   86.38    1.192  0.30( 0.30) 1.00   28566.8   10410.00
     18    27526.69   90.69    1.165  0.30( 0.30) 1.00   29221.1   10700.00
     19    26992.46   97.48    1.134  0.30( 0.30) 1.00   30187.6   10400.00
     20    26750.04   99.42    1.126  0.30( 0.30) 1.00   30412.7   10200.00
     21    25878.14  105.18    1.100  0.30( 0.30) 1.00   30974.3   10300.00
     22    24928.63  110.61    1.075  0.30( 0.30) 1.00   31195.9   10210.00
     23    22718.24  135.67    0.991  0.30( 0.30) 1.00   31889.0   10100.00
    TOTAL AREA(ACRES) =     31889.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    29621.25  Tc(MIN.) =   61.927
  EFFECTIVE AREA(ACRES) =  21292.54  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    31889.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11726.00 =   89123.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11726.00 TO NODE  11821.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.21  DOWNSTREAM(FEET) =    423.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1621.39   CHANNEL SLOPE =  0.0076
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.341
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       59.69      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29649.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.67
  AVERAGE FLOW DEPTH(FEET) =  13.22   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   63.77
  SUBAREA AREA(ACRES) =    59.69       SUBAREA RUNOFF(CFS) =   55.93
  EFFECTIVE AREA(ACRES) =  21352.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    31948.7         PEAK FLOW RATE(CFS) =   29621.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 13.21 FLOW VELOCITY(FEET/SEC.) = 14.67
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24496.28	38.74	1.718	0.30(0.30)	0.99	9725.7	11500.00
2	24880.71	40.41	1.676	0.30(0.30)	0.99	10362.5	11530.00
3	25786.43	45.06	1.566	0.30(0.30)	1.00	12043.5	11701.00
4	26216.58	47.16	1.516	0.30(0.30)	1.00	12852.8	11000.00
5	28776.01	57.19	1.389	0.30(0.30)	1.00	17902.8	11330.00
6	29257.29	59.53	1.370	0.30(0.30)	1.00	19165.1	11350.00
7	29420.93	60.89	1.360	0.30(0.30)	1.00	19904.9	10900.00
8	29534.78	62.40	1.350	0.30(0.30)	1.00	20675.8	11300.00
9	29621.25	63.77	1.341	0.30(0.30)	1.00	21352.2	11130.00
10	29176.31	72.07	1.286	0.30(0.30)	1.00	24399.7	11620.00
11	29039.00	74.32	1.271	0.30(0.30)	1.00	25172.6	11600.00
12	28894.51	75.63	1.263	0.30(0.30)	1.00	25553.5	10600.00
13	28607.87	80.24	1.232	0.30(0.30)	1.00	26929.7	11111.00
14	28535.95	81.15	1.226	0.30(0.30)	1.00	27179.6	11201.00
15	28472.14	81.69	1.223	0.30(0.30)	1.00	27311.8	11101.00
16	28147.84	86.46	1.191	0.30(0.30)	1.00	28322.3	10710.00
17	27942.40	88.26	1.180	0.30(0.30)	1.00	28626.5	10410.00
18	27526.69	92.57	1.156	0.30(0.30)	1.00	29280.8	10700.00
19	26992.46	99.38	1.126	0.30(0.30)	1.00	30247.3	10400.00
20	26750.04	101.31	1.117	0.30(0.30)	1.00	30472.4	10200.00
21	25878.14	107.09	1.091	0.30(0.30)	1.00	31034.0	10300.00
22	24928.63	112.55	1.067	0.30(0.30)	1.00	31255.5	10210.00
23	22718.24	137.66	0.986	0.30(0.30)	1.00	31948.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	150.22	30.03	1.943	0.30(0.30)	1.00	101.6	11801.00

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22142.56	30.03	1.943	0.30(0.30)	0.99	7639.8	11801.00
2	24625.96	38.74	1.718	0.30(0.30)	0.99	9827.3	11500.00
3	25006.51	40.41	1.676	0.30(0.30)	0.99	10464.1	11530.00
4	25902.12	45.06	1.566	0.30(0.30)	1.00	12145.0	11701.00
5	26327.71	47.16	1.516	0.30(0.30)	1.00	12954.4	11000.00
6	28875.57	57.19	1.389	0.30(0.30)	1.00	18004.3	11330.00
7	29355.09	59.53	1.370	0.30(0.30)	1.00	19266.7	11350.00

8	29517.85	60.89	1.360	0.30(0.30)	1.00	20006.5	10900.00
9	29630.79	62.40	1.350	0.30(0.30)	1.00	20777.4	11300.00
10	29716.43	63.77	1.341	0.30(0.30)	1.00	21453.8	11130.00
11	29266.48	72.07	1.286	0.30(0.30)	1.00	24501.3	11620.00
12	29127.81	74.32	1.271	0.30(0.30)	1.00	25274.1	11600.00
13	28982.53	75.63	1.263	0.30(0.30)	1.00	25655.1	10600.00
14	28693.11	80.24	1.232	0.30(0.30)	1.00	27031.3	11111.00
15	28620.64	81.15	1.226	0.30(0.30)	1.00	27281.2	11201.00
16	28556.51	81.69	1.223	0.30(0.30)	1.00	27413.4	11101.00
17	28229.33	86.46	1.191	0.30(0.30)	1.00	28423.9	10710.00
18	28022.80	88.26	1.180	0.30(0.30)	1.00	28728.1	10410.00
19	27604.99	92.57	1.156	0.30(0.30)	1.00	29382.4	10700.00
20	27067.96	99.38	1.126	0.30(0.30)	1.00	30348.8	10400.00
21	26824.74	101.31	1.117	0.30(0.30)	1.00	30574.0	10200.00
22	25950.46	107.09	1.091	0.30(0.30)	1.00	31135.6	10300.00
23	24998.71	112.55	1.067	0.30(0.30)	1.00	31357.1	10210.00
24	22780.97	137.66	0.986	0.30(0.30)	1.00	32050.3	10100.00

TOTAL AREA(ACRES) = 32050.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 29716.43 Tc(MIN.) = 63.769
EFFECTIVE AREA(ACRES) = 21453.80 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32050.3
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

****
FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 423.93 DOWNSTREAM(FEET) = 402.38
CHANNEL LENGTH THRU SUBAREA(FEET) = 1912.90 CHANNEL SLOPE = 0.0113
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.43
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.327
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.91	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29809.73
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.61
AVERAGE FLOW DEPTH(FEET) = 8.43 TRAVEL TIME(MIN.) = 2.18
Tc(MIN.) = 65.95
SUBAREA AREA(ACRES) = 201.91 SUBAREA RUNOFF(CFS) = 186.59
EFFECTIVE AREA(ACRES) = 21655.71 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32252.2 PEAK FLOW RATE(CFS) = 29716.43
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

```
  DEPTH(FEET) =  8.41   FLOW VELOCITY(FEET/SEC.) =  14.60
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11822.00 =   92657.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    402.38  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2380.10   CHANNEL SLOPE =  0.0091
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.307
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29769.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.60
  AVERAGE FLOW DEPTH(FEET) =   8.95   TRAVEL TIME(MIN.) =   2.92
  Tc(MIN.) =   68.87
  SUBAREA AREA(ACRES) =   116.13       SUBAREA RUNOFF(CFS) =  105.30
  EFFECTIVE AREA(ACRES) =  21771.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    32368.3         PEAK FLOW RATE(CFS) =   29716.43
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.94   FLOW VELOCITY(FEET/SEC.) =  13.59
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11822.00 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   68.87
  RAINFALL INTENSITY(INCH/HR) =   1.31
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   21771.85
  TOTAL STREAM AREA(ACRES) =   32368.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   29716.43

****************************************************************************
  FLOW PROCESS FROM NODE  11831.00 TO NODE  11832.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```



```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.20
  ELEVATION DATA: UPSTREAM(FEET) =   1353.30  DOWNSTREAM(FEET) =   1280.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.179
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.941
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.76      0.30     1.000     0    8.18
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.17
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      3.17

****************************************************************************
  FLOW PROCESS FROM NODE  11832.00 TO NODE  11833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1280.02  DOWNSTREAM(FEET) =   1070.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =   686.67   CHANNEL SLOPE =  0.3057
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.27
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.001
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.20
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   2.20
  Tc(MIN.) =   10.38
  SUBAREA AREA(ACRES) =     5.95       SUBAREA RUNOFF(CFS) =   19.82
  EFFECTIVE AREA(ACRES) =      6.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.7         PEAK FLOW RATE(CFS) =      22.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.33   FLOW VELOCITY(FEET/SEC.) =   6.30
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11833.00 =     934.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11833.00 TO NODE  11834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1070.08  DOWNSTREAM(FEET) =    913.56
 CHANNEL LENGTH THRU SUBAREA(FEET) =   977.36   CHANNEL SLOPE =  0.1601
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.73
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.562
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       23.21      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.55
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.10
 AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.30
 Tc(MIN.) =   12.68
 SUBAREA AREA(ACRES) =    23.21       SUBAREA RUNOFF(CFS) =   68.14
 EFFECTIVE AREA(ACRES) =     29.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       29.9         PEAK FLOW RATE(CFS) =      87.83
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   8.24
 LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11834.00 =    1912.23 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11834.00 TO NODE  11835.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    913.56  DOWNSTREAM(FEET) =    727.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.63   CHANNEL SLOPE =  0.0989
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.64
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.972
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       73.73      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     176.92
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.75
 AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   3.57
 Tc(MIN.) =   16.25
 SUBAREA AREA(ACRES) =    73.73       SUBAREA RUNOFF(CFS) =  177.32
 EFFECTIVE AREA(ACRES) =    103.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      103.7         PEAK FLOW RATE(CFS) =     249.27
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.86
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```
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.86   FLOW VELOCITY(FEET/SEC.) =   9.74
 LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11835.00 =    3787.86 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11835.00 TO NODE  11836.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    727.99  DOWNSTREAM(FEET) =    611.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.64   CHANNEL SLOPE =  0.0615
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.60
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.566
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       93.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     344.64
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.04
 AVERAGE FLOW DEPTH(FEET) =   2.53   TRAVEL TIME(MIN.) =   3.49
 Tc(MIN.) =   19.74
 SUBAREA AREA(ACRES) =    93.31       SUBAREA RUNOFF(CFS) =  190.30
 EFFECTIVE AREA(ACRES) =    196.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      197.0         PEAK FLOW RATE(CFS) =     401.69
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.74

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.74   FLOW VELOCITY(FEET/SEC.) =   9.45
 LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11836.00 =    5684.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11836.00 TO NODE  11837.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    611.39  DOWNSTREAM(FEET) =    508.59
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2178.15   CHANNEL SLOPE =  0.0472
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.31
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.270
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       98.92      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     489.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.08
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  AVERAGE FLOW DEPTH(FEET) =   3.26   TRAVEL TIME(MIN.) =   4.00
  Tc(MIN.) =   23.74
  SUBAREA AREA(ACRES) =    98.92       SUBAREA RUNOFF(CFS) =  175.36
  EFFECTIVE AREA(ACRES) =    295.88     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      295.9         PEAK FLOW RATE(CFS) =     524.53
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.38   FLOW VELOCITY(FEET/SEC.) =   9.25
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11837.00 =    7862.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11837.00 TO NODE  11838.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    508.59  DOWNSTREAM(FEET) =    448.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1942.91   CHANNEL SLOPE =  0.0309
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.02
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.053
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     587.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.18
  AVERAGE FLOW DEPTH(FEET) =   3.99   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   27.70
  SUBAREA AREA(ACRES) =    79.71       SUBAREA RUNOFF(CFS) =  125.73
  EFFECTIVE AREA(ACRES) =    375.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      375.6         PEAK FLOW RATE(CFS) =     592.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.01   FLOW VELOCITY(FEET/SEC.) =   8.20
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.00 =    9805.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.00 TO NODE  11838.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    448.50  DOWNSTREAM(FEET) =    420.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =   917.65   CHANNEL SLOPE =  0.0302
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.965
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     618.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   4.12   TRAVEL TIME(MIN.) =   1.86
  Tc(MIN.) =   29.56
  SUBAREA AREA(ACRES) =    34.57       SUBAREA RUNOFF(CFS) =   51.80
  EFFECTIVE AREA(ACRES) =    410.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      410.2         PEAK FLOW RATE(CFS) =     614.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.11   FLOW VELOCITY(FEET/SEC.) =   8.22
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11838.50 =   10723.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    420.79  DOWNSTREAM(FEET) =    380.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1615.83   CHANNEL SLOPE =  0.0248
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.865
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.54      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     629.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.69
  AVERAGE FLOW DEPTH(FEET) =   4.37   TRAVEL TIME(MIN.) =   3.50
  Tc(MIN.) =   33.06
  SUBAREA AREA(ACRES) =    21.54       SUBAREA RUNOFF(CFS) =   30.34
  EFFECTIVE AREA(ACRES) =    431.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      431.7         PEAK FLOW RATE(CFS) =     614.63
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.32   FLOW VELOCITY(FEET/SEC.) =   7.64
  LONGEST FLOWPATH FROM NODE  11831.00 TO NODE  11841.00 =   12339.04 FEET.
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****************************************************************************
  FLOW PROCESS FROM NODE  11838.50 TO NODE  11841.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.06
  RAINFALL INTENSITY(INCH/HR) =   1.87
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     431.70
  TOTAL STREAM AREA(ACRES) =     431.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     614.63

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22142.56   35.65    1.798  0.30( 0.30) 1.00    7957.8   11801.00
      1    24625.96   44.17    1.587  0.30( 0.30) 0.99   10145.3   11500.00
      1    25006.51   45.81    1.548  0.30( 0.30) 1.00   10782.2   11530.00
      1    25902.12   50.40    1.445  0.30( 0.30) 1.00   12463.1   11701.00
      1    26327.71   52.47    1.428  0.30( 0.30) 1.00   13272.4   11000.00
      1    28875.57   62.34    1.351  0.30( 0.30) 1.00   18322.4   11330.00
      1    29355.09   64.65    1.335  0.30( 0.30) 1.00   19584.7   11350.00
      1    29517.85   66.00    1.326  0.30( 0.30) 1.00   20324.5   10900.00
      1    29630.79   67.50    1.316  0.30( 0.30) 1.00   21095.4   11300.00
      1    29716.43   68.87    1.307  0.30( 0.30) 1.00   21771.8   11130.00
      1    29266.48   77.20    1.253  0.30( 0.30) 1.00   24819.3   11620.00
      1    29127.81   79.45    1.238  0.30( 0.30) 1.00   25592.2   11600.00
      1    28982.53   80.77    1.229  0.30( 0.30) 1.00   25973.2   10600.00
      1    28693.11   85.40    1.198  0.30( 0.30) 1.00   27349.3   11111.00
      1    28620.64   86.31    1.192  0.30( 0.30) 1.00   27599.2   11201.00
      1    28556.51   86.86    1.189  0.30( 0.30) 1.00   27731.4   11101.00
      1    28229.33   91.64    1.161  0.30( 0.30) 1.00   28741.9   10710.00
      1    28022.80   93.46    1.152  0.30( 0.30) 1.00   29046.1   10410.00
      1    27604.99   97.80    1.133  0.30( 0.30) 1.00   29700.4   10700.00
      1    27067.96  104.63    1.102  0.30( 0.30) 1.00   30666.9   10400.00
      1    26824.74  106.59    1.093  0.30( 0.30) 1.00   30892.0   10200.00
      1    25950.46  112.43    1.067  0.30( 0.30) 1.00   31453.6   10300.00
      1    24998.71  117.95    1.042  0.30( 0.30) 1.00   31675.2   10210.00
      1    22780.97  143.24    0.971  0.30( 0.30) 1.00   32368.3   10100.00
      2      614.63   33.06    1.865  0.30( 0.30) 1.00     431.7   11831.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22062.51   33.06    1.865  0.30( 0.30) 1.00    7810.7   11831.00
      2    22730.92   35.65    1.798  0.30( 0.30) 1.00    8389.5   11801.00
      3    25131.30   44.17    1.587  0.30( 0.30) 1.00   10577.0   11500.00
      4    25496.47   45.81    1.548  0.30( 0.30) 1.00   11213.9   11530.00
      5    26351.67   50.40    1.445  0.30( 0.30) 1.00   12894.8   11701.00
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      6    26770.60   52.47    1.428  0.30( 0.30) 1.00   13704.1   11000.00
      7    29288.13   62.34    1.351  0.30( 0.30) 1.00   18754.1   11330.00
      8    29761.65   64.65    1.335  0.30( 0.30) 1.00   20016.4   11350.00
      9    29920.92   66.00    1.326  0.30( 0.30) 1.00   20756.2   10900.00
     10    30029.97   67.50    1.316  0.30( 0.30) 1.00   21527.1   11300.00
     11    30112.07   68.87    1.307  0.30( 0.30) 1.00   22203.5   11130.00
     12    29640.54   77.20    1.253  0.30( 0.30) 1.00   25251.0   11620.00
     13    29496.02   79.45    1.238  0.30( 0.30) 1.00   26023.9   11600.00
     14    29347.33   80.77    1.229  0.30( 0.30) 1.00   26404.9   10600.00
     15    29045.91   85.40    1.198  0.30( 0.30) 1.00   27781.0   11111.00
     16    28971.08   86.31    1.192  0.30( 0.30) 1.00   28030.9   11201.00
     17    28905.53   86.86    1.189  0.30( 0.30) 1.00   28163.1   11101.00
     18    28567.30   91.64    1.161  0.30( 0.30) 1.00   29173.6   10710.00
     19    28357.57   93.46    1.152  0.30( 0.30) 1.00   29477.8   10410.00
     20    27932.08   97.80    1.133  0.30( 0.30) 1.00   30132.1   10700.00
     21    27382.97  104.63    1.102  0.30( 0.30) 1.00   31098.6   10400.00
     22    27136.30  106.59    1.093  0.30( 0.30) 1.00   31323.7   10200.00
     23    26251.71  112.43    1.067  0.30( 0.30) 1.00   31885.3   10300.00
     24    25290.20  117.95    1.042  0.30( 0.30) 1.00   32106.9   10210.00
     25    23044.66  143.24    0.971  0.30( 0.30) 1.00   32800.0   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   30112.07    Tc(MIN.) =    68.87
  EFFECTIVE AREA(ACRES) =   22203.54   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    32800.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  11841.00 =   95037.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11841.00 TO NODE  12527.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.74  DOWNSTREAM(FEET) =    347.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2830.43   CHANNEL SLOPE =  0.0118
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.287
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      116.59      0.30     0.997     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.997
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   30163.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.88
  AVERAGE FLOW DEPTH(FEET) =   8.38   TRAVEL TIME(MIN.) =   3.17
  Tc(MIN.) =   72.04
  SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =  103.62
  EFFECTIVE AREA(ACRES) =  22320.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =    32916.6         PEAK FLOW RATE(CFS) =   30112.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.37
```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.37 FLOW VELOCITY(FEET/SEC.) = 14.87
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 72.04
EFFECTIVE AREA(ACRES) = 22320.13 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997
PEAK FLOW RATE(CFS) = 30112.07

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22062.51	36.57	1.774	0.30(0.30)	1.00	7927.3	11831.00
2	22730.92	39.13	1.708	0.30(0.30)	1.00	8506.1	11801.00
3	25131.30	47.53	1.507	0.30(0.30)	1.00	10693.6	11500.00
4	25496.47	49.16	1.468	0.30(0.30)	1.00	11330.4	11530.00
5	26351.67	53.71	1.418	0.30(0.30)	1.00	13011.4	11701.00
6	26770.60	55.76	1.401	0.30(0.30)	1.00	13820.7	11000.00
7	29288.13	65.54	1.329	0.30(0.30)	1.00	18870.7	11330.00
8	29761.65	67.84	1.314	0.30(0.30)	1.00	20133.0	11350.00
9	29920.92	69.18	1.305	0.30(0.30)	1.00	20872.8	10900.00
10	30029.97	70.68	1.296	0.30(0.30)	1.00	21643.7	11300.00
11	30112.07	72.04	1.287	0.30(0.30)	1.00	22320.1	11130.00
12	29640.54	80.38	1.231	0.30(0.30)	1.00	25367.6	11620.00
13	29496.02	82.64	1.217	0.30(0.30)	1.00	26140.5	11600.00
14	29347.33	83.97	1.208	0.30(0.30)	1.00	26521.4	10600.00
15	29045.91	88.61	1.177	0.30(0.30)	1.00	27897.6	11111.00
16	28971.08	89.52	1.171	0.30(0.30)	1.00	28147.5	11201.00
17	28905.53	90.07	1.168	0.30(0.30)	1.00	28279.7	11101.00
18	28567.30	94.87	1.146	0.30(0.30)	1.00	29290.2	10710.00
19	28357.57	96.69	1.138	0.30(0.30)	1.00	29594.4	10410.00
20	27932.08	101.05	1.118	0.30(0.30)	1.00	30248.7	10700.00
21	27382.97	107.91	1.087	0.30(0.30)	1.00	31215.2	10400.00
22	27136.30	109.87	1.079	0.30(0.30)	1.00	31440.3	10200.00
23	26251.71	115.74	1.052	0.30(0.30)	1.00	32001.9	10300.00
24	25290.20	121.31	1.030	0.30(0.30)	1.00	32223.4	10210.00
25	23044.66	146.70	0.962	0.30(0.30)	1.00	32916.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:
```

FILE NAME: S19.DAT
TIME/DATE OF STUDY: 10:23 09/12/2017

==========

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

==========

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
USER-DEFINED TABLED RAINFALL USED
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	6.126
2)	10.00;	3.912
3)	15.00;	3.013
4)	20.00;	2.469
5)	25.00;	2.132
6)	30.00;	1.903
7)	40.00;	1.647
8)	50.00;	1.421
9)	60.00;	1.323
10)	90.00;	1.122
11)	120.00;	0.986
12)	180.00;	0.829
13)	360.00;	0.620
14)	1200.00;	0.273

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO IN-CROSSFALL (FT)	STREET-CROSSFALL: SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****
FLOW PROCESS FROM NODE 11900.00 TO NODE 11901.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

==========

INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.79
ELEVATION DATA: UPSTREAM(FEET) = 2369.48 DOWNSTREAM(FEET) = 2332.92

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.203
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.150
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL ".4 DWELLING/ACRE"	-	1.62	0.30	0.999	0	7.20

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999
SUBAREA RUNOFF(CFS) = 7.07
TOTAL AREA(ACRES) = 1.62 PEAK FLOW RATE(CFS) = 7.07

****
FLOW PROCESS FROM NODE 11901.00 TO NODE 11902.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 2332.92 DOWNSTREAM(FEET) = 2297.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 664.26 CHANNEL SLOPE = 0.0530
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.61
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.841
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.35	0.30	0.906	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.906
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.63
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.47
AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 3.19
Tc(MIN.) = 10.39
SUBAREA AREA(ACRES) = 8.35 SUBAREA RUNOFF(CFS) = 26.83
EFFECTIVE AREA(ACRES) = 9.97 AREA-AVERAGED Fm(INCH/HR) = 0.28
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.92
TOTAL AREA(ACRES) = 10.0 PEAK FLOW RATE(CFS) = 31.99
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.69 FLOW VELOCITY(FEET/SEC.) = 4.06
LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11902.00 = 960.05 FEET.

****
FLOW PROCESS FROM NODE 11902.00 TO NODE 11902.50 IS CODE = 56

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2297.70  DOWNSTREAM(FEET) =   2263.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.77   CHANNEL SLOPE =  0.0369
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.267
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.48      0.30     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      78.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.84
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   13.59
  SUBAREA AREA(ACRES) =    34.48       SUBAREA RUNOFF(CFS) =   92.96
  EFFECTIVE AREA(ACRES) =     44.45     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.91
  TOTAL AREA(ACRES) =       44.5         PEAK FLOW RATE(CFS) =     119.79
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.64   FLOW VELOCITY(FEET/SEC.) =   5.52
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11902.50 =    1888.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11902.50 TO NODE  11903.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.40  DOWNSTREAM(FEET) =   2252.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   895.50   CHANNEL SLOPE =  0.0126
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.762
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.65      0.30     0.958     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.958
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     146.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.02
  AVERAGE FLOW DEPTH(FEET) =   2.44   TRAVEL TIME(MIN.) =   3.72
  Tc(MIN.) =   17.31
  SUBAREA AREA(ACRES) =    23.65       SUBAREA RUNOFF(CFS) =   52.68
  EFFECTIVE AREA(ACRES) =     68.10     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       68.1         PEAK FLOW RATE(CFS) =     152.29
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.50   FLOW VELOCITY(FEET/SEC.) =   4.06
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11903.00 =    2784.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11903.00 TO NODE  11904.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2252.14  DOWNSTREAM(FEET) =   2186.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1924.35   CHANNEL SLOPE =  0.0343
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.314
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.53      0.30     0.961     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.961
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     214.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.42
  AVERAGE FLOW DEPTH(FEET) =   2.29   TRAVEL TIME(MIN.) =   4.99
  Tc(MIN.) =   22.30
  SUBAREA AREA(ACRES) =    68.53       SUBAREA RUNOFF(CFS) =  124.95
  EFFECTIVE AREA(ACRES) =    136.63     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =      136.6         PEAK FLOW RATE(CFS) =     249.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.49   FLOW VELOCITY(FEET/SEC.) =   6.70
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11904.00 =    4708.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11904.00 TO NODE  11905.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2186.04  DOWNSTREAM(FEET) =   1957.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.87   CHANNEL SLOPE =  0.1187
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.99
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.122
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       63.15      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     301.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.97
  AVERAGE FLOW DEPTH(FEET) =   1.97   TRAVEL TIME(MIN.) =   2.93
  Tc(MIN.) =   25.22
  SUBAREA AREA(ACRES) =    63.15       SUBAREA RUNOFF(CFS) =  103.54
  EFFECTIVE AREA(ACRES) =    199.78     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      199.8         PEAK FLOW RATE(CFS) =     329.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.07   FLOW VELOCITY(FEET/SEC.) =  11.26
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11905.00 =    6635.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11905.00 TO NODE  11906.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1957.34  DOWNSTREAM(FEET) =   1244.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2498.96   CHANNEL SLOPE =  0.2854
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.004
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     394.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.17
  AVERAGE FLOW DEPTH(FEET) =   1.80   TRAVEL TIME(MIN.) =   2.58
  Tc(MIN.) =   27.80
  SUBAREA AREA(ACRES) =    84.87       SUBAREA RUNOFF(CFS) =  130.15
  EFFECTIVE AREA(ACRES) =    284.65     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      284.6         PEAK FLOW RATE(CFS) =     438.60
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.90   FLOW VELOCITY(FEET/SEC.) =  16.70
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11906.00 =    9134.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =   1244.16  DOWNSTREAM(FEET) =    873.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3370.75   CHANNEL SLOPE =  0.1098
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.848
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      199.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     577.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.91
  AVERAGE FLOW DEPTH(FEET) =   2.85   TRAVEL TIME(MIN.) =   4.35
  Tc(MIN.) =   32.15
  SUBAREA AREA(ACRES) =   199.43       SUBAREA RUNOFF(CFS) =  277.84
  EFFECTIVE AREA(ACRES) =    484.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =      484.1         PEAK FLOW RATE(CFS) =     676.50
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.10   FLOW VELOCITY(FEET/SEC.) =  13.47
  LONGEST FLOWPATH FROM NODE  11900.00 TO NODE  11920.00 =   12505.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11906.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   32.15
  RAINFALL INTENSITY(INCH/HR) =   1.85
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98
  EFFECTIVE STREAM AREA(ACRES) =     484.08
  TOTAL STREAM AREA(ACRES) =     484.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     676.50

****************************************************************************
  FLOW PROCESS FROM NODE  11910.00 TO NODE  11911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   517.62
  ELEVATION DATA: UPSTREAM(FEET) =   2531.88  DOWNSTREAM(FEET) =   2441.33

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.185
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.519
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        3.46      0.30      1.000     0   12.19
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.02
  TOTAL AREA(ACRES) =      3.46   PEAK FLOW RATE(CFS) =     10.02

****************************************************************************
  FLOW PROCESS FROM NODE  11911.00 TO NODE  11912.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2441.33  DOWNSTREAM(FEET) =   2382.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   397.30   CHANNEL SLOPE =  0.1488
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.259
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        5.79      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.58
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   1.45
  Tc(MIN.) =   13.63
  SUBAREA AREA(ACRES) =     5.79       SUBAREA RUNOFF(CFS) =   15.42
  EFFECTIVE AREA(ACRES) =      9.25     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =      24.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.44   FLOW VELOCITY(FEET/SEC.) =   5.17
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11912.00 =     914.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11912.00 TO NODE  11913.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2382.20  DOWNSTREAM(FEET) =   2263.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1891.47   CHANNEL SLOPE =  0.0626
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.578
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       54.30      0.30      1.000     -
```



```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.88
  AVERAGE FLOW DEPTH(FEET) =   1.13   TRAVEL TIME(MIN.) =   5.37
  Tc(MIN.) =   19.00
  SUBAREA AREA(ACRES) =    54.30       SUBAREA RUNOFF(CFS) =  111.33
  EFFECTIVE AREA(ACRES) =     63.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       63.5          PEAK FLOW RATE(CFS) =     130.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   6.81
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11913.00 =    2806.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11913.00 TO NODE  11914.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2263.77  DOWNSTREAM(FEET) =   1845.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1957.31   CHANNEL SLOPE =  0.2138
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.348
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       65.14      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     190.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.69
  AVERAGE FLOW DEPTH(FEET) =   1.29   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   21.79
  SUBAREA AREA(ACRES) =    65.14       SUBAREA RUNOFF(CFS) =  120.10
  EFFECTIVE AREA(ACRES) =    128.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      128.7          PEAK FLOW RATE(CFS) =     237.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.46   FLOW VELOCITY(FEET/SEC.) =  12.56
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11914.00 =    4763.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11914.00 TO NODE  11915.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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  ELEVATION DATA: UPSTREAM(FEET) =   1845.23  DOWNSTREAM(FEET) =   1557.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1686.78   CHANNEL SLOPE =  0.1708
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.197
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     304.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.52
  AVERAGE FLOW DEPTH(FEET) =   1.79   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =   24.03
  SUBAREA AREA(ACRES) =    78.52       SUBAREA RUNOFF(CFS) =  134.07
  EFFECTIVE AREA(ACRES) =    207.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.2          PEAK FLOW RATE(CFS) =     353.81
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.95   FLOW VELOCITY(FEET/SEC.) =  13.07
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11915.00 =    6450.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11915.00 TO NODE  11916.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1557.21  DOWNSTREAM(FEET) =   1403.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.39   CHANNEL SLOPE =  0.0806
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.60
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.037
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       70.48      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     408.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.45
  AVERAGE FLOW DEPTH(FEET) =   2.58   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   27.08
  SUBAREA AREA(ACRES) =    70.48       SUBAREA RUNOFF(CFS) =  110.17
  EFFECTIVE AREA(ACRES) =    277.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      277.7          PEAK FLOW RATE(CFS) =     434.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.66
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.66   FLOW VELOCITY(FEET/SEC.) =  10.65
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11916.00 =    8359.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11916.00 TO NODE  11917.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1403.38  DOWNSTREAM(FEET) =   1079.99
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1945.82   CHANNEL SLOPE =  0.1662
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.64
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.939
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      232.20      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     605.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.16
  AVERAGE FLOW DEPTH(FEET) =   2.62   TRAVEL TIME(MIN.) =   2.14
  Tc(MIN.) =   29.22
  SUBAREA AREA(ACRES) =   232.20       SUBAREA RUNOFF(CFS) =  342.49
  EFFECTIVE AREA(ACRES) =    509.89     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      509.9          PEAK FLOW RATE(CFS) =     752.07
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.94   FLOW VELOCITY(FEET/SEC.) =  16.11
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11917.00 =   10305.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1079.99  DOWNSTREAM(FEET) =    873.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2563.91   CHANNEL SLOPE =  0.0804
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.837
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      110.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     828.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.74
```

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  AVERAGE FLOW DEPTH(FEET) =   3.73   TRAVEL TIME(MIN.) =   3.36
  Tc(MIN.) =   32.57
  SUBAREA AREA(ACRES) =   110.82       SUBAREA RUNOFF(CFS) =  153.31
  EFFECTIVE AREA(ACRES) =    620.71     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      620.7         PEAK FLOW RATE(CFS) =     858.72
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.80   FLOW VELOCITY(FEET/SEC.) =  12.86
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11917.00 TO NODE  11920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   32.57
  RAINFALL INTENSITY(INCH/HR) =   1.84
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     620.71
  TOTAL STREAM AREA(ACRES) =     620.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     858.72

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      676.50   32.15    1.848  0.30( 0.30) 0.98     484.1   11900.00
      2      858.72   32.57    1.837  0.30( 0.30) 1.00     620.7   11910.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1530.06   32.15    1.848  0.30( 0.30) 0.99    1096.8   11900.00
      2     1530.52   32.57    1.837  0.30( 0.30) 0.99    1104.8   11910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1530.52    Tc(MIN.) =    32.57
  EFFECTIVE AREA(ACRES) =    1104.79   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     1104.8
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11920.00 =   12869.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11920.00 TO NODE  11921.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    873.95  DOWNSTREAM(FEET) =    827.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1417.25   CHANNEL SLOPE =  0.0325
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.781
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      107.47      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1602.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.86
  AVERAGE FLOW DEPTH(FEET) =   6.44   TRAVEL TIME(MIN.) =   2.17
  Tc(MIN.) =   34.75
  SUBAREA AREA(ACRES) =   107.47       SUBAREA RUNOFF(CFS) =  143.30
  EFFECTIVE AREA(ACRES) =   1212.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     1212.3         PEAK FLOW RATE(CFS) =    1618.46
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.47   FLOW VELOCITY(FEET/SEC.) =  10.89
  LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11921.00 =   14286.85 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1619.45   34.33    1.792  0.30( 0.30) 0.99    1204.2   11900.00
      2     1618.46   34.75    1.781  0.30( 0.30) 0.99    1212.3   11910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1619.45  Tc(MIN.) =   34.33
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1204.23

****************************************************************************
  FLOW PROCESS FROM NODE  11921.00 TO NODE  11922.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    827.94  DOWNSTREAM(FEET) =    753.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.43   CHANNEL SLOPE =  0.0394
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.726
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      344.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1840.35
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 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.10
 AVERAGE FLOW DEPTH(FEET) =   6.57   TRAVEL TIME(MIN.) =   2.60
 Tc(MIN.) =   36.93
 SUBAREA AREA(ACRES) =   344.27       SUBAREA RUNOFF(CFS) =  441.77
 EFFECTIVE AREA(ACRES) =   1548.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =     1556.5         PEAK FLOW RATE(CFS) =    1989.13
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.82

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.82   FLOW VELOCITY(FEET/SEC.) =  12.35
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11922.00 =   16173.28 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1989.13   36.93    1.726  0.30( 0.30) 0.99    1548.5   11900.00
     2     1984.30   37.35    1.715  0.30( 0.30) 1.00    1556.5   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1989.13  Tc(MIN.) =   36.93
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1548.50

****************************************************************************
 FLOW PROCESS FROM NODE  11922.00 TO NODE  11923.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    753.55  DOWNSTREAM(FEET) =    641.58
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.88   CHANNEL SLOPE =  0.0391
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.630
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      165.18      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2088.00
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.47
 AVERAGE FLOW DEPTH(FEET) =   6.99   TRAVEL TIME(MIN.) =   3.82
 Tc(MIN.) =   40.75
 SUBAREA AREA(ACRES) =   165.18       SUBAREA RUNOFF(CFS) =  197.74
 EFFECTIVE AREA(ACRES) =   1713.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1721.7         PEAK FLOW RATE(CFS) =    2053.57
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.93

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.93   FLOW VELOCITY(FEET/SEC.) =  12.42
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11923.00 =   19034.16 FEET.
```



```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2053.57   40.75    1.630  0.30( 0.30) 1.00    1713.7   11900.00
     2     2048.35   41.17    1.620  0.30( 0.30) 1.00    1721.7   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2053.57  Tc(MIN.) =   40.75
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1713.68

****************************************************************************
 FLOW PROCESS FROM NODE  11923.00 TO NODE  11924.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    641.58  DOWNSTREAM(FEET) =    579.89
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1844.02   CHANNEL SLOPE =  0.0335
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.60
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.573
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      433.73      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2301.96
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.07
 AVERAGE FLOW DEPTH(FEET) =   7.58   TRAVEL TIME(MIN.) =   2.55
 Tc(MIN.) =   43.30
 SUBAREA AREA(ACRES) =   433.73       SUBAREA RUNOFF(CFS) =  496.76
 EFFECTIVE AREA(ACRES) =   2147.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2155.4         PEAK FLOW RATE(CFS) =    2461.56
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.82

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.82   FLOW VELOCITY(FEET/SEC.) =  12.27
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11924.00 =   20878.18 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2461.56   43.30    1.573  0.30( 0.30) 1.00    2147.4   11900.00
     2     2452.07   43.72    1.563  0.30( 0.30) 1.00    2155.4   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2461.56  Tc(MIN.) =   43.30
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2147.41

****************************************************************************
 FLOW PROCESS FROM NODE  11924.00 TO NODE  11925.00 IS CODE =  56
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 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    579.89  DOWNSTREAM(FEET) =    494.12
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2756.15   CHANNEL SLOPE =  0.0311
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.18
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.487
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      265.42      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2603.34
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.12
 AVERAGE FLOW DEPTH(FEET) =   8.16   TRAVEL TIME(MIN.) =   3.79
 Tc(MIN.) =   47.09
 SUBAREA AREA(ACRES) =   265.42       SUBAREA RUNOFF(CFS) =  283.53
 EFFECTIVE AREA(ACRES) =   2412.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2420.9         PEAK FLOW RATE(CFS) =    2579.55
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.13

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.13   FLOW VELOCITY(FEET/SEC.) =  12.09
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11925.00 =   23634.33 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2579.55   47.09    1.487  0.30( 0.30) 1.00    2412.8   11900.00
     2     2566.93   47.52    1.477  0.30( 0.30) 1.00    2420.9   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2579.55  Tc(MIN.) =   47.09
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2412.83

******************************************************************************
 FLOW PROCESS FROM NODE  11925.00 TO NODE  11926.00 IS CODE =  56
------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    494.12  DOWNSTREAM(FEET) =    458.40
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1922.70   CHANNEL SLOPE =  0.0186
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.23
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.418
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       97.46      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2628.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.03
 AVERAGE FLOW DEPTH(FEET) =   9.22   TRAVEL TIME(MIN.) =   3.20
 Tc(MIN.) =   50.28
 SUBAREA AREA(ACRES) =    97.46       SUBAREA RUNOFF(CFS) =   98.09
 EFFECTIVE AREA(ACRES) =   2510.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2518.3         PEAK FLOW RATE(CFS) =    2579.55
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.14

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.14   FLOW VELOCITY(FEET/SEC.) =   9.97
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11926.00 =   25557.03 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2579.55   50.28    1.418  0.30( 0.30) 1.00    2510.3   11900.00
     2     2566.93   50.72    1.414  0.30( 0.30) 1.00    2518.3   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2579.55  Tc(MIN.) =   50.28
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2510.29

******************************************************************************
 FLOW PROCESS FROM NODE  11926.00 TO NODE  11927.00 IS CODE =  56
------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    458.40  DOWNSTREAM(FEET) =    399.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2170.13   CHANNEL SLOPE =  0.0274
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.41
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.388
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       53.83      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2605.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.55
 AVERAGE FLOW DEPTH(FEET) =   8.41   TRAVEL TIME(MIN.) =   3.13
 Tc(MIN.) =   53.41
 SUBAREA AREA(ACRES) =    53.83       SUBAREA RUNOFF(CFS) =   52.69
 EFFECTIVE AREA(ACRES) =   2564.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2572.1         PEAK FLOW RATE(CFS) =    2579.55
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.37
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.37   FLOW VELOCITY(FEET/SEC.) =  11.53
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2579.55   53.41    1.388  0.30( 0.30) 1.00    2564.1   11900.00
     2     2566.93   53.85    1.383  0.30( 0.30) 1.00    2572.1   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2579.55  Tc(MIN.) =   53.41
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    2564.12

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610401Y.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)         (ACRES)    NODE
     1     1112.52   23.88  0.30( 0.30) 1.00     620.7   40120.00
     2     1103.67   25.69  0.30( 0.30) 1.00     652.1   40100.00
   TOTAL AREA(ACRES) =      652.1

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2579.55   53.41    1.388  0.30( 0.30) 1.00    2564.1   11900.00
     2     2566.93   53.85    1.383  0.30( 0.30) 1.00    2572.1   11910.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1112.52   23.88    2.207  0.30( 0.30) 1.00     620.7   40120.00
     2     1103.67   25.69    2.100  0.30( 0.30) 1.00     652.1   40100.00
 LONGEST FLOWPATH FROM NODE  40100.00 TO NODE  11927.00 =   10245.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     3134.55   23.88    2.207  0.30( 0.30) 1.00    1767.3   40120.00
     2     3156.82   25.69    2.100  0.30( 0.30) 1.00    1885.3   40100.00
     3     3246.24   53.41    1.388  0.30( 0.30) 1.00    3216.2   11900.00
     4     3231.00   53.85    1.383  0.30( 0.30) 1.00    3224.2   11910.00
   TOTAL AREA(ACRES) =      3224.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
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 PEAK FLOW RATE(CFS) =     3246.24  Tc(MIN.) =   53.413
 EFFECTIVE AREA(ACRES) =   3216.18  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3224.2
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.00 =   27727.16 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.00 TO NODE  11927.50 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    399.00  DOWNSTREAM(FEET) =    384.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   986.26   CHANNEL SLOPE =  0.0152
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.60
 CHANNEL FLOW THRU SUBAREA(CFS) =    3246.24
 FLOW VELOCITY(FEET/SEC.) =   9.82   FLOW DEPTH(FEET) =  10.60
 TRAVEL TIME(MIN.) =   1.67   Tc(MIN.) =   55.09
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     3134.55   25.57    2.106  0.30( 0.30) 1.00    1767.3   40120.00
     2     3156.82   27.38    2.023  0.30( 0.30) 1.00    1885.3   40100.00
     3     3246.24   55.09    1.371  0.30( 0.30) 1.00    3216.2   11900.00
     4     3231.00   55.53    1.367  0.30( 0.30) 1.00    3224.2   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    3246.24  Tc(MIN.) =   55.09
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3216.18

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610402Y.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)         (ACRES)    NODE
     1       90.15   13.36  0.30( 0.30) 1.00      33.3   40200.00
   TOTAL AREA(ACRES) =       33.3

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11927.50 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
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 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      3134.55   25.57    2.106  0.30( 0.30) 1.00    1767.3   40120.00
     2      3156.82   27.38    2.023  0.30( 0.30) 1.00    1885.3   40100.00
     3      3246.24   55.09    1.371  0.30( 0.30) 1.00    3216.2   11900.00
     4      3231.00   55.53    1.367  0.30( 0.30) 1.00    3224.2   11910.00
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       90.15   13.36    3.307  0.30( 0.30) 1.00      33.3   40200.00
 LONGEST FLOWPATH FROM NODE  40200.00 TO NODE  11927.50 =    1999.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      2817.53   13.36    3.307  0.30( 0.30) 1.00     956.7   40200.00
     2      3188.68   25.57    2.106  0.30( 0.30) 1.00    1800.6   40120.00
     3      3208.47   27.38    2.023  0.30( 0.30) 1.00    1918.6   40100.00
     4      3278.35   55.09    1.371  0.30( 0.30) 1.00    3249.5   11900.00
     5      3262.97   55.53    1.367  0.30( 0.30) 1.00    3257.5   11910.00
   TOTAL AREA(ACRES) =      3257.5

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     3278.35  Tc(MIN.) =   55.088
 EFFECTIVE AREA(ACRES) =   3249.50  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     3257.5
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11927.50 =   28713.42 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11927.50 TO NODE  11928.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    384.00  DOWNSTREAM(FEET) =    359.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   647.19   CHANNEL SLOPE =  0.0386
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.68
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.364
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       78.01      0.30     0.984     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.984
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3315.85
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.97
 AVERAGE FLOW DEPTH(FEET) =   8.68   TRAVEL TIME(MIN.) =   0.77
 Tc(MIN.) =   55.86
 SUBAREA AREA(ACRES) =    78.01       SUBAREA RUNOFF(CFS) =   75.01
 EFFECTIVE AREA(ACRES) =   3327.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3335.5         PEAK FLOW RATE(CFS) =    3278.35
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 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.63

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.63   FLOW VELOCITY(FEET/SEC.) =  13.93
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11928.00 =   29360.61 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      2817.53   14.16    3.164  0.30( 0.30) 1.00    1034.7   40200.00
     2      3188.68   26.35    2.070  0.30( 0.30) 1.00    1878.6   40120.00
     3      3208.47   28.15    1.988  0.30( 0.30) 1.00    1996.6   40100.00
     4      3278.35   55.86    1.364  0.30( 0.30) 1.00    3327.5   11900.00
     5      3262.97   56.30    1.359  0.30( 0.30) 1.00    3335.5   11910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    3278.35  Tc(MIN.) =   55.86
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    3327.51

****************************************************************************
 FLOW PROCESS FROM NODE  11928.00 TO NODE  11929.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    359.00  DOWNSTREAM(FEET) =    341.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1322.66   CHANNEL SLOPE =  0.0131
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.340
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       8.18      0.30     0.890     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3282.30
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.32
 AVERAGE FLOW DEPTH(FEET) =  11.00   TRAVEL TIME(MIN.) =   2.37
 Tc(MIN.) =   58.23
 SUBAREA AREA(ACRES) =     8.18       SUBAREA RUNOFF(CFS) =    7.90
 EFFECTIVE AREA(ACRES) =   3335.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     3343.7         PEAK FLOW RATE(CFS) =    3278.35
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.00

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 11.00   FLOW VELOCITY(FEET/SEC.) =   9.32
 LONGEST FLOWPATH FROM NODE  11910.00 TO NODE  11929.00 =   30683.27 FEET.

 ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.53	16.62	2.837	0.30(0.30)	1.00	1042.9	40200.00
2	3188.68	28.73	1.961	0.30(0.30)	1.00	1886.8	40120.00
3	3208.47	30.53	1.889	0.30(0.30)	1.00	2004.8	40100.00
4	3278.35	58.23	1.340	0.30(0.30)	1.00	3335.7	11900.00
5	3262.97	58.67	1.336	0.30(0.30)	1.00	3343.7	11910.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 3278.35 Tc(MIN.) = 58.23
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 3335.69

****
FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 10

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 11527.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S18.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22062.51	36.57	0.30(0.30)	1.00	7927.3	11831.00
2	22730.92	39.13	0.30(0.30)	1.00	8506.1	11801.00
3	25131.30	47.53	0.30(0.30)	1.00	10693.6	11500.00
4	25496.47	49.16	0.30(0.30)	1.00	11330.4	11530.00
5	26351.67	53.71	0.30(0.30)	1.00	13011.4	11701.00
6	26770.60	55.76	0.30(0.30)	1.00	13820.7	11000.00
7	29288.13	65.54	0.30(0.30)	1.00	18870.7	11330.00
8	30112.07	72.04	0.30(0.30)	1.00	22320.1	11130.00
9	29640.54	80.38	0.30(0.30)	1.00	25367.6	11620.00
10	29496.02	82.64	0.30(0.30)	1.00	26140.5	11600.00
11	29045.91	88.61	0.30(0.30)	1.00	27897.6	11111.00
12	28905.53	90.07	0.30(0.30)	1.00	28279.7	11101.00
13	28567.30	94.87	0.30(0.30)	1.00	29290.2	10710.00
14	28357.57	96.69	0.30(0.30)	1.00	29594.4	10410.00
15	27932.08	101.05	0.30(0.30)	1.00	30248.7	10700.00
16	27382.97	107.91	0.30(0.30)	1.00	31215.2	10400.00
17	27136.30	109.87	0.30(0.30)	1.00	31440.3	10200.00
18	26251.71	115.74	0.30(0.30)	1.00	32001.9	10300.00
19	25290.20	121.31	0.30(0.30)	1.00	32223.4	10210.00
20	23044.66	146.70	0.30(0.30)	1.00	32916.6	10100.00

TOTAL AREA(ACRES) = 32916.6

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========
MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S25.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	0.30(0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	0.30(0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	0.30(0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	0.30(0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	0.30(0.29)	0.98	9925.0	12400.00
6	9222.81	90.84	0.30(0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	0.30(0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	0.30(0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	0.30(0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	0.30(0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	0.30(0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	0.30(0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.30(0.29)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 14.0

>>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	0.30(0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	0.30(0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	0.30(0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	0.30(0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	0.30(0.29)	0.98	9925.0	12400.00
6	9222.81	90.84	0.30(0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	0.30(0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	0.30(0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	0.30(0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	0.30(0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	0.30(0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	0.30(0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.30(0.29)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

****
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	1.288	0.30(0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	1.200	0.30(0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	1.192	0.30(0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	1.174	0.30(0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	1.147	0.30(0.29)	0.98	9925.0	12400.00
6	9222.81	90.84	1.118	0.30(0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	1.100	0.30(0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	1.083	0.30(0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	1.071	0.30(0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	1.059	0.30(0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	1.055	0.30(0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	1.006	0.30(0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.976	0.30(0.29)	0.98	13237.1	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22062.51	36.57	1.735	0.30(0.30)	1.00	7927.3	11831.00
2	22730.92	39.13	1.669	0.30(0.30)	1.00	8506.1	11801.00
3	25131.30	47.53	1.477	0.30(0.30)	1.00	10693.6	11500.00
4	25496.47	49.16	1.440	0.30(0.30)	1.00	11330.4	11530.00
5	26351.67	53.71	1.385	0.30(0.30)	1.00	13011.4	11701.00
6	26770.60	55.76	1.365	0.30(0.30)	1.00	13820.7	11000.00
7	29288.13	65.54	1.286	0.30(0.30)	1.00	18870.7	11330.00
8	30112.07	72.04	1.242	0.30(0.30)	1.00	22320.1	11130.00
9	29640.54	80.38	1.186	0.30(0.30)	1.00	25367.6	11620.00
10	29496.02	82.64	1.171	0.30(0.30)	1.00	26140.5	11600.00
11	29045.91	88.61	1.131	0.30(0.30)	1.00	27897.6	11111.00
12	28905.53	90.07	1.122	0.30(0.30)	1.00	28279.7	11101.00
13	28567.30	94.87	1.100	0.30(0.30)	1.00	29290.2	10710.00
14	28357.57	96.69	1.092	0.30(0.30)	1.00	29594.4	10410.00
15	27932.08	101.05	1.072	0.30(0.30)	1.00	30248.7	10700.00
16	27382.97	107.91	1.041	0.30(0.30)	1.00	31215.2	10400.00
17	27136.30	109.87	1.032	0.30(0.30)	1.00	31440.3	10200.00
18	26251.71	115.74	1.005	0.30(0.30)	1.00	32001.9	10300.00
19	25290.20	121.31	0.983	0.30(0.30)	1.00	32223.4	10210.00
20	23044.66	146.70	0.916	0.30(0.30)	1.00	32916.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28202.79	36.57	1.735	0.30(0.30)	0.99	11535.3	11831.00
2	29001.54	39.13	1.669	0.30(0.30)	0.99	12366.1	11801.00
3	31680.78	47.53	1.477	0.30(0.30)	0.99	15382.7	11500.00
4	32059.21	49.16	1.440	0.30(0.30)	0.99	16180.3	11530.00
5	33175.07	53.71	1.385	0.30(0.30)	0.99	18309.8	11701.00
6	33723.77	55.76	1.365	0.30(0.30)	0.99	19321.5	11000.00
7	36737.89	65.16	1.288	0.30(0.30)	0.99	25104.5	12500.00
8	36861.41	65.54	1.286	0.30(0.30)	0.99	25355.6	11330.00
9	38146.04	72.04	1.242	0.30(0.30)	0.99	29785.9	11130.00
10	38236.23	78.31	1.200	0.30(0.30)	0.99	33025.2	12300.00
11	38278.66	79.61	1.192	0.30(0.30)	0.99	33776.2	12330.00
12	38288.66	80.38	1.186	0.30(0.30)	0.99	34210.7	11620.00

13	38298.84	82.21	1.174	0.30(0.30)	0.99	35193.2	12410.00
14	38296.41	82.64	1.171	0.30(0.30)	0.99	35422.3	11600.00
15	38235.07	86.22	1.147	0.30(0.30)	0.99	37119.2	12400.00
16	38165.37	88.61	1.131	0.30(0.30)	0.99	38182.9	11111.00
17	38092.75	90.07	1.122	0.30(0.30)	0.99	38786.0	11101.00
18	38074.14	90.84	1.118	0.30(0.30)	0.99	39063.9	12211.00
19	37920.62	94.81	1.100	0.30(0.30)	0.99	40486.6	12201.00
20	37917.02	94.87	1.100	0.30(0.30)	0.99	40506.2	10710.00
21	37724.96	96.69	1.092	0.30(0.30)	0.99	41029.8	10410.00
22	37548.43	98.70	1.083	0.30(0.30)	0.99	41572.9	12111.00
23	37301.99	101.05	1.072	0.30(0.30)	0.99	42213.2	10700.00
24	37292.19	101.16	1.071	0.30(0.30)	0.99	42242.7	12231.00
25	37020.55	103.97	1.059	0.30(0.30)	0.99	42942.2	12101.10
26	36933.59	104.81	1.055	0.30(0.30)	0.99	43141.4	12261.00
27	36582.72	107.91	1.041	0.30(0.30)	0.99	43793.0	10400.00
28	36271.25	109.87	1.032	0.30(0.30)	0.99	44153.7	10200.00
29	35210.36	115.65	1.006	0.30(0.30)	0.99	45105.1	12010.00
30	35192.02	115.74	1.005	0.30(0.30)	0.99	45115.7	10300.00
31	34003.39	121.31	0.983	0.30(0.30)	0.99	45421.6	10210.00
32	33671.84	123.88	0.976	0.30(0.30)	0.99	45530.6	12000.00
33	30899.38	146.70	0.916	0.30(0.30)	0.99	46153.7	10100.00

TOTAL AREA(ACRES) = 46153.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 38298.84 Tc(MIN.) = 82.205
EFFECTIVE AREA(ACRES) = 35193.20 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46153.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

****
FLOW PROCESS FROM NODE 12527.00 TO NODE 11929.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 347.47 DOWNSTREAM(FEET) = 341.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 532.38 CHANNEL SLOPE = 0.0110
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.79
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.170
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.37	0.30	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38304.50
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.72
AVERAGE FLOW DEPTH(FEET) = 9.79 TRAVEL TIME(MIN.) = 0.56
Tc(MIN.) = 82.77
SUBAREA AREA(ACRES) = 14.37 SUBAREA RUNOFF(CFS) = 11.31
EFFECTIVE AREA(ACRES) = 35207.57 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 46168.0 PEAK FLOW RATE(CFS) = 38298.84
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.78 FLOW VELOCITY(FEET/SEC.) = 15.73
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28202.79	37.20	1.719	0.30(0.30)	0.99	11549.6	11831.00
2	29001.54	39.75	1.653	0.30(0.30)	0.99	12380.5	11801.00
3	31680.78	48.13	1.463	0.30(0.30)	0.99	15397.0	11500.00
4	32059.21	49.76	1.426	0.30(0.30)	0.99	16194.7	11530.00
5	33175.07	54.30	1.379	0.30(0.30)	0.99	18324.2	11701.00
6	33723.77	56.35	1.359	0.30(0.30)	0.99	19335.8	11000.00
7	36737.89	65.74	1.285	0.30(0.30)	0.99	25118.9	12500.00
8	36861.41	66.11	1.282	0.30(0.30)	0.99	25369.9	11330.00
9	38146.04	72.60	1.239	0.30(0.30)	0.99	29800.3	11130.00
10	38236.23	78.88	1.197	0.30(0.30)	0.99	33039.6	12300.00
11	38278.66	80.17	1.188	0.30(0.30)	0.99	33790.5	12330.00
12	38288.66	80.95	1.183	0.30(0.30)	0.99	34225.1	11620.00
13	38298.84	82.77	1.170	0.30(0.30)	0.99	35207.6	12410.00
14	38296.41	83.21	1.168	0.30(0.30)	0.99	35436.6	11600.00
15	38235.07	86.78	1.144	0.30(0.30)	0.99	37133.6	12400.00
16	38165.37	89.17	1.128	0.30(0.30)	0.99	38197.3	11111.00
17	38092.75	90.64	1.119	0.30(0.30)	0.99	38800.3	11101.00
18	38074.14	91.40	1.116	0.30(0.30)	0.99	39078.3	12211.00
19	37920.62	95.38	1.098	0.30(0.30)	0.99	40501.0	12201.00
20	37917.02	95.43	1.097	0.30(0.30)	0.99	40520.6	10710.00
21	37724.96	97.26	1.089	0.30(0.30)	0.99	41044.2	10410.00
22	37548.43	99.27	1.080	0.30(0.30)	0.99	41587.2	12111.00
23	37301.99	101.62	1.069	0.30(0.30)	0.99	42227.6	10700.00
24	37292.19	101.73	1.069	0.30(0.30)	0.99	42257.1	12231.00
25	37020.55	104.54	1.056	0.30(0.30)	0.99	42956.6	12101.10
26	36933.59	105.38	1.052	0.30(0.30)	0.99	43155.8	12261.00
27	36582.72	108.48	1.038	0.30(0.30)	0.99	43807.3	10400.00
28	36271.25	110.44	1.029	0.30(0.30)	0.99	44168.0	10200.00
29	35210.36	116.23	1.003	0.30(0.30)	0.99	45119.4	12010.00
30	35192.02	116.32	1.003	0.30(0.30)	0.99	45130.1	10300.00
31	34003.39	121.90	0.981	0.30(0.30)	0.99	45436.0	10210.00
32	33671.84	124.46	0.974	0.30(0.30)	0.99	45544.9	12000.00
33	30899.38	147.31	0.915	0.30(0.30)	0.99	46168.0	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 38298.84 Tc(MIN.) = 82.77
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 35207.57

****
FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28202.79	37.20	1.719	0.30(0.30)	0.99	11549.6	11831.00

2	29001.54	39.75	1.653	0.30(0.30)	0.99	12380.5	11801.00
3	31680.78	48.13	1.463	0.30(0.30)	0.99	15397.0	11500.00
4	32059.21	49.76	1.426	0.30(0.30)	0.99	16194.7	11530.00
5	33175.07	54.30	1.379	0.30(0.30)	0.99	18324.2	11701.00
6	33723.77	56.35	1.359	0.30(0.30)	0.99	19335.8	11000.00
7	36737.89	65.74	1.285	0.30(0.30)	0.99	25118.9	12500.00
8	36861.41	66.11	1.282	0.30(0.30)	0.99	25369.9	11330.00
9	38146.04	72.60	1.239	0.30(0.30)	0.99	29800.3	11130.00
10	38236.23	78.88	1.197	0.30(0.30)	0.99	33039.6	12300.00
11	38278.66	80.17	1.188	0.30(0.30)	0.99	33790.5	12330.00
12	38288.66	80.95	1.183	0.30(0.30)	0.99	34225.1	11620.00
13	38298.84	82.77	1.170	0.30(0.30)	0.99	35207.6	12410.00
14	38296.41	83.21	1.168	0.30(0.30)	0.99	35436.6	11600.00
15	38235.07	86.78	1.144	0.30(0.30)	0.99	37133.6	12400.00
16	38165.37	89.17	1.128	0.30(0.30)	0.99	38197.3	11111.00
17	38092.75	90.64	1.119	0.30(0.30)	0.99	38800.3	11101.00
18	38074.14	91.40	1.116	0.30(0.30)	0.99	39078.3	12211.00
19	37920.62	95.38	1.098	0.30(0.30)	0.99	40501.0	12201.00
20	37917.02	95.43	1.097	0.30(0.30)	0.99	40520.6	10710.00
21	37724.96	97.26	1.089	0.30(0.30)	0.99	41044.2	10410.00
22	37548.43	99.27	1.080	0.30(0.30)	0.99	41587.2	12111.00
23	37301.99	101.62	1.069	0.30(0.30)	0.99	42227.6	10700.00
24	37292.19	101.73	1.069	0.30(0.30)	0.99	42257.1	12231.00
25	37020.55	104.54	1.056	0.30(0.30)	0.99	42956.6	12101.10
26	36933.59	105.38	1.052	0.30(0.30)	0.99	43155.8	12261.00
27	36582.72	108.48	1.038	0.30(0.30)	0.99	43807.3	10400.00
28	36271.25	110.44	1.029	0.30(0.30)	0.99	44168.0	10200.00
29	35210.36	116.23	1.003	0.30(0.30)	0.99	45119.4	12010.00
30	35192.02	116.32	1.003	0.30(0.30)	0.99	45130.1	10300.00
31	34003.39	121.90	0.981	0.30(0.30)	0.99	45436.0	10210.00
32	33671.84	124.46	0.974	0.30(0.30)	0.99	45544.9	12000.00
33	30899.38	147.31	0.915	0.30(0.30)	0.99	46168.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.53	16.62	2.837	0.30(0.30)	1.00	1042.9	40200.00
2	3188.68	28.73	1.961	0.30(0.30)	1.00	1886.8	40120.00
3	3208.47	30.53	1.889	0.30(0.30)	1.00	2004.8	40100.00
4	3278.35	58.23	1.340	0.30(0.30)	1.00	3335.7	11900.00
5	3262.97	58.67	1.336	0.30(0.30)	1.00	3343.7	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25330.83	16.62	2.837	0.30(0.30)	0.99	6202.0	40200.00
2	28687.77	28.73	1.961	0.30(0.30)	0.99	10807.9	40120.00
3	29136.17	30.53	1.889	0.30(0.30)	0.99	11484.0	40100.00
4	31428.09	37.20	1.719	0.30(0.30)	0.99	13874.9	11831.00
5	32233.26	39.75	1.653	0.30(0.30)	0.99	14828.3	11801.00
6	34933.67	48.13	1.463	0.30(0.30)	0.99	18247.8	11500.00
7	35316.21	49.76	1.426	0.30(0.30)	0.99	19123.7	11530.00
8	36443.52	54.30	1.379	0.30(0.30)	0.99	21471.3	11701.00
9	36997.39	56.35	1.359	0.30(0.30)	0.99	22581.4	11000.00
10	37604.40	58.23	1.340	0.30(0.30)	0.99	23827.1	11900.00
11	37730.98	58.67	1.336	0.30(0.30)	0.99	24107.5	11910.00

12	39838.87	65.74	1.285	0.30(0.30)	0.99	28462.6	12500.00
13	39954.48	66.11	1.282	0.30(0.30)	0.99	28713.7	11330.00
14	41102.23	72.60	1.239	0.30(0.30)	0.99	33144.0	11130.00
15	41060.13	78.88	1.197	0.30(0.30)	0.99	36383.3	12300.00
16	41075.25	80.17	1.188	0.30(0.30)	0.99	37134.3	12330.00
17	41068.96	80.95	1.183	0.30(0.30)	0.99	37568.8	11620.00
18	41040.71	82.77	1.170	0.30(0.30)	0.99	38551.3	12410.00
19	41029.02	83.21	1.168	0.30(0.30)	0.99	38780.4	11600.00
20	40892.30	86.78	1.144	0.30(0.30)	0.99	40477.3	12400.00
21	40772.28	89.17	1.128	0.30(0.30)	0.99	41541.0	11111.00
22	40673.12	90.64	1.119	0.30(0.30)	0.99	42144.1	11101.00
23	40643.55	91.40	1.116	0.30(0.30)	0.99	42422.0	12211.00
24	40433.39	95.38	1.098	0.30(0.30)	0.99	43844.7	12201.00
25	40428.94	95.43	1.097	0.30(0.30)	0.99	43864.3	10710.00
26	40210.86	97.26	1.089	0.30(0.30)	0.99	44387.9	10410.00
27	40005.67	99.27	1.080	0.30(0.30)	0.99	44930.9	12111.00
28	39725.68	101.62	1.069	0.30(0.30)	0.99	45571.3	10700.00
29	39714.27	101.73	1.069	0.30(0.30)	0.99	45600.8	12231.00
30	39402.63	104.54	1.056	0.30(0.30)	0.99	46300.3	12101.10
31	39303.71	105.38	1.052	0.30(0.30)	0.99	46499.5	12261.00
32	38908.56	108.48	1.038	0.30(0.30)	0.99	47151.1	10400.00
33	38569.07	110.44	1.029	0.30(0.30)	0.99	47511.8	10200.00
34	37425.68	116.23	1.003	0.30(0.30)	0.99	48463.2	12010.00
35	37405.98	116.32	1.003	0.30(0.30)	0.99	48473.8	10300.00
36	36149.29	121.90	0.981	0.30(0.30)	0.99	48779.7	10210.00
37	35796.61	124.46	0.974	0.30(0.30)	0.99	48888.7	12000.00
38	32836.05	147.31	0.915	0.30(0.30)	0.99	49511.8	10100.00

TOTAL AREA(ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 41102.23 Tc(MIN.) = 72.603
EFFECTIVE AREA(ACRES) = 33144.04 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49511.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 49511.8 TC(MIN.) = 72.60
EFFECTIVE AREA(ACRES) = 33144.04 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994
PEAK FLOW RATE(CFS) = 41102.23

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25330.83	16.62	2.837	0.30(0.30)	0.99	6202.0	40200.00
2	28687.77	28.73	1.961	0.30(0.30)	0.99	10807.9	40120.00
3	29136.17	30.53	1.889	0.30(0.30)	0.99	11484.0	40100.00
4	31428.09	37.20	1.719	0.30(0.30)	0.99	13874.9	11831.00
5	32233.26	39.75	1.653	0.30(0.30)	0.99	14828.3	11801.00
6	34933.67	48.13	1.463	0.30(0.30)	0.99	18247.8	11500.00
7	35316.21	49.76	1.426	0.30(0.30)	0.99	19123.7	11530.00
8	36443.52	54.30	1.379	0.30(0.30)	0.99	21471.3	11701.00
9	36997.39	56.35	1.359	0.30(0.30)	0.99	22581.4	11000.00
10	37604.40	58.23	1.340	0.30(0.30)	0.99	23827.1	11900.00
11	37730.98	58.67	1.336	0.30(0.30)	0.99	24107.5	11910.00
12	39838.87	65.74	1.285	0.30(0.30)	0.99	28462.6	12500.00
13	39954.48	66.11	1.282	0.30(0.30)	0.99	28713.7	11330.00

14	41102.23	72.60	1.239	0.30(0.30)	0.99	33144.0	11130.00
15	41060.13	78.88	1.197	0.30(0.30)	0.99	36383.3	12300.00
16	41075.25	80.17	1.188	0.30(0.30)	0.99	37134.3	12330.00
17	41068.96	80.95	1.183	0.30(0.30)	0.99	37568.8	11620.00
18	41040.71	82.77	1.170	0.30(0.30)	0.99	38551.3	12410.00
19	41029.02	83.21	1.168	0.30(0.30)	0.99	38780.4	11600.00
20	40892.30	86.78	1.144	0.30(0.30)	0.99	40477.3	12400.00
21	40772.28	89.17	1.128	0.30(0.30)	0.99	41541.0	11111.00
22	40673.12	90.64	1.119	0.30(0.30)	0.99	42144.1	11101.00
23	40643.55	91.40	1.116	0.30(0.30)	0.99	42422.0	12211.00
24	40433.39	95.38	1.098	0.30(0.30)	0.99	43844.7	12201.00
25	40428.94	95.43	1.097	0.30(0.30)	0.99	43864.3	10710.00
26	40210.86	97.26	1.089	0.30(0.30)	0.99	44387.9	10410.00
27	40005.67	99.27	1.080	0.30(0.30)	0.99	44930.9	12111.00
28	39725.68	101.62	1.069	0.30(0.30)	0.99	45571.3	10700.00
29	39714.27	101.73	1.069	0.30(0.30)	0.99	45600.8	12231.00
30	39402.63	104.54	1.056	0.30(0.30)	0.99	46300.3	12101.10
31	39303.71	105.38	1.052	0.30(0.30)	0.99	46499.5	12261.00
32	38908.56	108.48	1.038	0.30(0.30)	0.99	47151.1	10400.00
33	38569.07	110.44	1.029	0.30(0.30)	0.99	47511.8	10200.00
34	37425.68	116.23	1.003	0.30(0.30)	0.99	48463.2	12010.00
35	37405.98	116.32	1.003	0.30(0.30)	0.99	48473.8	10300.00
36	36149.29	121.90	0.981	0.30(0.30)	0.99	48779.7	10210.00
37	35796.61	124.46	0.974	0.30(0.30)	0.99	48888.7	12000.00
38	32836.05	147.31	0.915	0.30(0.30)	0.99	49511.8	10100.00

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S20.DAT
  TIME/DATE OF STUDY: 08:10 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.549
   2)   10.00;  3.628
   3)   15.00;  2.829
   4)   20.00;  2.353
   5)   25.00;  2.048
   6)   30.00;  1.832
   7)   40.00;  1.577
   8)   50.00;  1.373
   9)   60.00;  1.248
  10)   90.00;  1.043
  11)  120.00;  0.905
  12)  180.00;  0.750
  13)  360.00;  0.547
  14) 1440.00;  0.235
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
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**************************************************************************
  FLOW PROCESS FROM NODE  12000.00 TO NODE  12001.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   965.01
  ELEVATION DATA: UPSTREAM(FEET) =   4506.20  DOWNSTREAM(FEET) =   4179.61

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.700
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.037
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        9.03      0.30     1.000     0   13.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     22.24
  TOTAL AREA(ACRES) =      9.03   PEAK FLOW RATE(CFS) =     22.24

**************************************************************************
  FLOW PROCESS FROM NODE  12001.00 TO NODE  12002.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4179.61  DOWNSTREAM(FEET) =   3849.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   976.60   CHANNEL SLOPE =  0.3380
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.765
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   1.97
  Tc(MIN.) =   15.67
  SUBAREA AREA(ACRES) =    18.82       SUBAREA RUNOFF(CFS) =   41.75
  EFFECTIVE AREA(ACRES) =     27.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.8          PEAK FLOW RATE(CFS) =      61.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   9.36
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12002.00 =    1941.61 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12002.00 TO NODE  12003.00 IS CODE =  56
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3849.51  DOWNSTREAM(FEET) =   3265.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1892.03   CHANNEL SLOPE =  0.3086
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.509
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       68.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     130.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.75
  AVERAGE FLOW DEPTH(FEET) =   0.94   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   18.36
  SUBAREA AREA(ACRES) =    68.96       SUBAREA RUNOFF(CFS) =  137.11
  EFFECTIVE AREA(ACRES) =     96.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       96.8         PEAK FLOW RATE(CFS) =     192.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.17   FLOW VELOCITY(FEET/SEC.) =  13.30
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12003.00 =    3833.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3265.69  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3118.62   CHANNEL SLOPE =  0.2688
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.265
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      328.28      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     483.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.83
  AVERAGE FLOW DEPTH(FEET) =   2.04   TRAVEL TIME(MIN.) =   3.09
  Tc(MIN.) =   21.45
  SUBAREA AREA(ACRES) =   328.28       SUBAREA RUNOFF(CFS) =  580.48
  EFFECTIVE AREA(ACRES) =    425.09     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      425.1         PEAK FLOW RATE(CFS) =     751.67
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.59   FLOW VELOCITY(FEET/SEC.) =  19.13
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12003.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.45
  RAINFALL INTENSITY(INCH/HR) =   2.26
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     425.09
  TOTAL STREAM AREA(ACRES) =     425.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     751.67

****************************************************************************
  FLOW PROCESS FROM NODE  12010.00 TO NODE  12011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   264.80
  ELEVATION DATA: UPSTREAM(FEET) =   4208.12  DOWNSTREAM(FEET) =   4068.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.470
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.600
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        2.06      0.30     1.000     0    7.47
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.97
  TOTAL AREA(ACRES) =      2.06   PEAK FLOW RATE(CFS) =      7.97

****************************************************************************
  FLOW PROCESS FROM NODE  12011.00 TO NODE  12012.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   4068.13  DOWNSTREAM(FEET) =   3694.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.45   CHANNEL SLOPE =  0.5703
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.950
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        3.98      0.30      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.44
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   1.69
  Tc(MIN.) =    9.16
  SUBAREA AREA(ACRES) =     3.98       SUBAREA RUNOFF(CFS) =   13.07
  EFFECTIVE AREA(ACRES) =      6.04     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      19.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   7.36
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12012.00 =     919.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12012.00 TO NODE  12013.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3694.92  DOWNSTREAM(FEET) =   3415.55
  CHANNEL LENGTH THRU SUBAREA(FEET) =   981.94   CHANNEL SLOPE =  0.2845
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.479
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       35.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.26
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   1.77
  Tc(MIN.) =   10.93
  SUBAREA AREA(ACRES) =    35.56       SUBAREA RUNOFF(CFS) =  101.75
  EFFECTIVE AREA(ACRES) =     41.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.6         PEAK FLOW RATE(CFS) =     119.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =  11.06
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12013.00 =    1901.19 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12013.00 TO NODE  12014.00 IS CODE =  56
```



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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3415.55  DOWNSTREAM(FEET) =   2756.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.68   CHANNEL SLOPE =  0.3420
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.117
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       72.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     211.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.17
  AVERAGE FLOW DEPTH(FEET) =   1.20   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   13.20
  SUBAREA AREA(ACRES) =    72.40       SUBAREA RUNOFF(CFS) =  183.58
  EFFECTIVE AREA(ACRES) =    114.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.0         PEAK FLOW RATE(CFS) =     289.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOW VELOCITY(FEET/SEC.) =  15.70
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12014.00 =    3827.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2756.62  DOWNSTREAM(FEET) =   2427.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1697.28   CHANNEL SLOPE =  0.1940
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.814
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -      121.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     427.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.45
  AVERAGE FLOW DEPTH(FEET) =   2.09   TRAVEL TIME(MIN.) =   1.96
  Tc(MIN.) =   15.15
  SUBAREA AREA(ACRES) =   121.96       SUBAREA RUNOFF(CFS) =  276.00
  EFFECTIVE AREA(ACRES) =    235.96     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      236.0         PEAK FLOW RATE(CFS) =     533.98
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.35   FLOW VELOCITY(FEET/SEC.) =  15.43
  LONGEST FLOWPATH FROM NODE  12010.00 TO NODE  12020.00 =    5525.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12014.00 TO NODE  12020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.15
  RAINFALL INTENSITY(INCH/HR) =   2.81
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     235.96
  TOTAL STREAM AREA(ACRES) =     235.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     533.98

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      751.67   21.45    2.265  0.30( 0.30) 1.00     425.1   12000.00
      2      533.98   15.15    2.814  0.30( 0.30) 1.00     236.0   12010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1213.64   15.15    2.814  0.30( 0.30) 1.00     536.3   12010.00
      2     1168.91   21.45    2.265  0.30( 0.30) 1.00     661.0   12000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1213.64    Tc(MIN.) =    15.15
  EFFECTIVE AREA(ACRES) =     536.29   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      661.0
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12020.00 =    6952.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12020.00 TO NODE  12021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2427.28  DOWNSTREAM(FEET) =   2056.25
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2698.04   CHANNEL SLOPE =  0.1375
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.59
```



```
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.583
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      376.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1600.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.49
  AVERAGE FLOW DEPTH(FEET) =   4.54   TRAVEL TIME(MIN.) =   2.43
  Tc(MIN.) =   17.58
  SUBAREA AREA(ACRES) =   376.13       SUBAREA RUNOFF(CFS) =  772.84
  EFFECTIVE AREA(ACRES) =    912.42     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1037.2          PEAK FLOW RATE(CFS) =    1874.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.91   FLOW VELOCITY(FEET/SEC.) =  19.27
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12021.00 =    9650.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12021.00 TO NODE  12022.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2056.25  DOWNSTREAM(FEET) =   1864.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2552.86   CHANNEL SLOPE =  0.0750
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.18
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.339
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      347.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2193.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.08
  AVERAGE FLOW DEPTH(FEET) =   6.13   TRAVEL TIME(MIN.) =   2.65
  Tc(MIN.) =   20.23
  SUBAREA AREA(ACRES) =   347.45       SUBAREA RUNOFF(CFS) =  637.60
  EFFECTIVE AREA(ACRES) =   1259.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1384.6          PEAK FLOW RATE(CFS) =    2311.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.28   FLOW VELOCITY(FEET/SEC.) =  16.30
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12022.00 =   12203.16 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  12022.00 TO NODE  12023.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1864.68  DOWNSTREAM(FEET) =   1710.75
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1886.57   CHANNEL SLOPE =  0.0816
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.48
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.228
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      280.70      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2555.50
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.26
 AVERAGE FLOW DEPTH(FEET) =   6.46   TRAVEL TIME(MIN.) =   1.82
 Tc(MIN.) =   22.05
 SUBAREA AREA(ACRES) =   280.70       SUBAREA RUNOFF(CFS) =  487.04
 EFFECTIVE AREA(ACRES) =   1540.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1665.3         PEAK FLOW RATE(CFS) =    2673.03
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.60

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.60   FLOW VELOCITY(FEET/SEC.) =  17.45
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12023.00 =   14089.73 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1710.75  DOWNSTREAM(FEET) =   1672.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1944.87   CHANNEL SLOPE =  0.0196
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.041
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      248.35      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2867.69
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.46
 AVERAGE FLOW DEPTH(FEET) =   9.47   TRAVEL TIME(MIN.) =   3.10
 Tc(MIN.) =   25.15
 SUBAREA AREA(ACRES) =   248.35       SUBAREA RUNOFF(CFS) =  389.26
 EFFECTIVE AREA(ACRES) =   1788.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1913.7         PEAK FLOW RATE(CFS) =    2803.90
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.37

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.37   FLOW VELOCITY(FEET/SEC.) =  10.41
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12024.00 =   16034.60 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1913.7  TC(MIN.) =     25.15
 EFFECTIVE AREA(ACRES) =   1788.92  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE(CFS)   =    2803.90

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2803.90   25.15    2.041  0.30( 0.30) 1.00    1788.9   12010.00
     2     2562.91   31.73    1.788  0.30( 0.30) 1.00    1913.7   12000.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

------------------------------------------------------------------------------
  FILE NAME: S21.DAT
  TIME/DATE OF STUDY: 08:10 07/16/2018
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.549
   2)   10.00;  3.628
   3)   15.00;  2.829
   4)   20.00;  2.353
   5)   25.00;  2.048
   6)   30.00;  1.832
   7)   40.00;  1.577
   8)   50.00;  1.373
   9)   60.00;  1.248
  10)   90.00;  1.043
  11)  120.00;  0.905
  12)  180.00;  0.750
  13)  360.00;  0.547
  14) 1440.00;  0.235
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
******************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 15.1
------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S20.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1     2803.90   25.15  0.30( 0.30) 1.00    1788.9   12010.00
      2     2562.91   31.73  0.30( 0.30) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =     1913.7

******************************************************************************
  FLOW PROCESS FROM NODE  12023.00 TO NODE  12024.00 IS CODE = 14.0
------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1     2803.90   25.15  0.30( 0.30) 1.00    1788.9   12010.00
      2     2562.91   31.73  0.30( 0.30) 1.00    1913.7   12000.00
    TOTAL AREA(ACRES) =      1913.7

******************************************************************************
  FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1672.60  DOWNSTREAM(FEET) =   1636.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   780.49   CHANNEL SLOPE =  0.0458
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.82
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.002
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       93.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2875.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.35
  AVERAGE FLOW DEPTH(FEET) =   7.82   TRAVEL TIME(MIN.) =   0.91
  Tc(MIN.) =   26.06
  SUBAREA AREA(ACRES) =    93.19       SUBAREA RUNOFF(CFS) =  142.78
  EFFECTIVE AREA(ACRES) =   1882.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2006.9         PEAK FLOW RATE(CFS) =    2883.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.82   FLOW VELOCITY(FEET/SEC.) =  14.37
```

```
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12024.00 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   26.06
 RAINFALL INTENSITY(INCH/HR) =   2.00
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =    1882.11
 TOTAL STREAM AREA(ACRES) =    2006.87
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    2883.64

****************************************************************************
 FLOW PROCESS FROM NODE  12101.10 TO NODE  12101.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   847.57
 ELEVATION DATA: UPSTREAM(FEET) =   3435.00  DOWNSTREAM(FEET) =   2774.23

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.008
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.467
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        6.56      0.30     1.000     0   11.01
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     18.70
 TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =     18.70

****************************************************************************
 FLOW PROCESS FROM NODE  12101.20 TO NODE  12101.30 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2774.23  DOWNSTREAM(FEET) =   2097.09
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1205.19   CHANNEL SLOPE =  0.5619
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.178
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       34.88      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
```



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 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.01
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.11
 AVERAGE FLOW DEPTH(FEET) =   0.52   TRAVEL TIME(MIN.) =   1.81
 Tc(MIN.) =   12.82
 SUBAREA AREA(ACRES) =    34.88       SUBAREA RUNOFF(CFS) =   90.35
 EFFECTIVE AREA(ACRES) =     41.44     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       41.4          PEAK FLOW RATE(CFS) =     107.34
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =  13.35
 LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12101.30 =    2052.76 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2097.09  DOWNSTREAM(FEET) =   1636.82
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1553.74   CHANNEL SLOPE =  0.2962
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.14
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.852
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       56.40      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     172.23
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.68
 AVERAGE FLOW DEPTH(FEET) =   1.11   TRAVEL TIME(MIN.) =   2.04
 Tc(MIN.) =   14.86
 SUBAREA AREA(ACRES) =    56.40       SUBAREA RUNOFF(CFS) =  129.53
 EFFECTIVE AREA(ACRES) =     97.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       97.8          PEAK FLOW RATE(CFS) =     224.71
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.29   FLOW VELOCITY(FEET/SEC.) =  13.79
 LONGEST FLOWPATH FROM NODE  12101.10 TO NODE  12102.00 =    3606.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12101.30 TO NODE  12102.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =   14.86
 RAINFALL INTENSITY(INCH/HR) =   2.85
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =      97.84
 TOTAL STREAM AREA(ACRES) =      97.84
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     224.71

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2883.64   26.06    2.002  0.30( 0.30) 1.00    1882.1   12010.00
     1     2645.01   32.65    1.764  0.30( 0.30) 1.00    2006.9   12000.00
     2      224.71   14.86    2.852  0.30( 0.30) 1.00      97.8   12101.10

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2689.32   14.86    2.852  0.30( 0.30) 1.00    1171.0   12101.10
     2     3033.55   26.06    2.002  0.30( 0.30) 1.00    1979.9   12010.00
     3     2773.96   32.65    1.764  0.30( 0.30) 1.00    2104.7   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    3033.55    Tc(MIN.) =    26.06
 EFFECTIVE AREA(ACRES) =    1979.95   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     2104.7
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12102.00 =   16815.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12102.00 TO NODE  12103.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1636.82  DOWNSTREAM(FEET) =   1558.46
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2049.75   CHANNEL SLOPE =  0.0382
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.46
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.895
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      116.59      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3117.21
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.70
 AVERAGE FLOW DEPTH(FEET) =   8.46   TRAVEL TIME(MIN.) =   2.49
 Tc(MIN.) =   28.55
 SUBAREA AREA(ACRES) =   116.59       SUBAREA RUNOFF(CFS) =  167.33
 EFFECTIVE AREA(ACRES) =   2096.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
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 TOTAL AREA(ACRES) =     2221.3         PEAK FLOW RATE(CFS) =    3033.55
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.35

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.35   FLOW VELOCITY(FEET/SEC.) =  13.61
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12103.00 =   18864.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12103.00 TO NODE  12104.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1558.46  DOWNSTREAM(FEET) =   1453.87
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1971.34   CHANNEL SLOPE =  0.0531
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.04
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.815
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      355.30      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3275.87
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.68
 AVERAGE FLOW DEPTH(FEET) =   8.02   TRAVEL TIME(MIN.) =   2.10
 Tc(MIN.) =   30.65
 SUBAREA AREA(ACRES) =   355.30       SUBAREA RUNOFF(CFS) =  484.63
 EFFECTIVE AREA(ACRES) =   2451.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     2576.6         PEAK FLOW RATE(CFS) =    3344.29
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.10

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  8.10   FLOW VELOCITY(FEET/SEC.) =  15.76
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12104.00 =   20836.18 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12104.00 TO NODE  12105.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1453.87  DOWNSTREAM(FEET) =   1369.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1885.63   CHANNEL SLOPE =  0.0446
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.59
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.762
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      200.37      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3476.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.92
  AVERAGE FLOW DEPTH(FEET) =   8.58   TRAVEL TIME(MIN.) =   2.11
  Tc(MIN.) =   32.75
  SUBAREA AREA(ACRES) =   200.37       SUBAREA RUNOFF(CFS) =  263.62
  EFFECTIVE AREA(ACRES) =   2652.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     2777.0         PEAK FLOW RATE(CFS) =    3489.40
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.59   FLOW VELOCITY(FEET/SEC.) =  14.94
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12105.00 =   22721.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12105.00 TO NODE  12106.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1369.72  DOWNSTREAM(FEET) =   1298.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1910.12   CHANNEL SLOPE =  0.0374
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.20
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.705
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      339.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3704.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.20
  AVERAGE FLOW DEPTH(FEET) =   9.19   TRAVEL TIME(MIN.) =   2.24
  Tc(MIN.) =   35.00
  SUBAREA AREA(ACRES) =   339.52       SUBAREA RUNOFF(CFS) =  429.22
  EFFECTIVE AREA(ACRES) =   2991.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3116.5         PEAK FLOW RATE(CFS) =    3782.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.28   FLOW VELOCITY(FEET/SEC.) =  14.27
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12106.00 =   24631.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
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  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1298.29  DOWNSTREAM(FEET) =   1215.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2982.44   CHANNEL SLOPE =  0.0277
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.05
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.606
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -      164.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3879.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.84
  AVERAGE FLOW DEPTH(FEET) =  10.04   TRAVEL TIME(MIN.) =   3.87
  Tc(MIN.) =   38.87
  SUBAREA AREA(ACRES) =   164.97       SUBAREA RUNOFF(CFS) =  193.90
  EFFECTIVE AREA(ACRES) =   3156.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     3281.5         PEAK FLOW RATE(CFS) =    3782.16
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.93   FLOW VELOCITY(FEET/SEC.) =  12.76
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12106.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   38.87
  RAINFALL INTENSITY(INCH/HR) =   1.61
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    3156.70
  TOTAL STREAM AREA(ACRES) =    3281.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    3782.16

****************************************************************************
  FLOW PROCESS FROM NODE  12111.00 TO NODE  12112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   939.51
  ELEVATION DATA: UPSTREAM(FEET) =   3108.05  DOWNSTREAM(FEET) =   2753.95

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.265
```

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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.106
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,BROADLEAF"       -        8.25      0.30     1.000     0   13.27
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     20.84
 TOTAL AREA(ACRES) =      8.25   PEAK FLOW RATE(CFS) =     20.84

****************************************************************************
 FLOW PROCESS FROM NODE  12112.00 TO NODE  12113.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2753.95  DOWNSTREAM(FEET) =   2458.45
 CHANNEL LENGTH THRU SUBAREA(FEET) =   945.14   CHANNEL SLOPE =  0.3127
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.48
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.802
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       16.51      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.45
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.81
 AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   2.02
 Tc(MIN.) =   15.28
 SUBAREA AREA(ACRES) =    16.51       SUBAREA RUNOFF(CFS) =   37.18
 EFFECTIVE AREA(ACRES) =     24.76     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       24.8         PEAK FLOW RATE(CFS) =      55.76
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.57

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.57   FLOW VELOCITY(FEET/SEC.) =   8.79
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12113.00 =    1884.65 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12113.00 TO NODE  12114.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2458.45  DOWNSTREAM(FEET) =   1823.37
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1903.76   CHANNEL SLOPE =  0.3336
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.88
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.539
 SUBAREA LOSS RATE DATA(AMC  II):
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  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -       57.98      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     114.30
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.50
 AVERAGE FLOW DEPTH(FEET) =   0.85   TRAVEL TIME(MIN.) =   2.76
 Tc(MIN.) =   18.04
 SUBAREA AREA(ACRES) =    57.98       SUBAREA RUNOFF(CFS) =  116.86
 EFFECTIVE AREA(ACRES) =     82.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       82.7         PEAK FLOW RATE(CFS) =     166.76
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =  13.04
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12114.00 =    3788.41 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12114.00 TO NODE  12115.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1823.37  DOWNSTREAM(FEET) =   1500.53
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1685.04   CHANNEL SLOPE =  0.1916
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.70
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.338
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -      124.07      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     280.60
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.71
 AVERAGE FLOW DEPTH(FEET) =   1.66   TRAVEL TIME(MIN.) =   2.21
 Tc(MIN.) =   20.25
 SUBAREA AREA(ACRES) =   124.07       SUBAREA RUNOFF(CFS) =  227.53
 EFFECTIVE AREA(ACRES) =    206.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      206.8         PEAK FLOW RATE(CFS) =     379.26
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.96

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =  13.92
 LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12115.00 =    5473.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =  56
----------------------------------------------------------------------------
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```
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1500.53  DOWNSTREAM(FEET) =   1215.72
CHANNEL LENGTH THRU SUBAREA(FEET) =  1875.45   CHANNEL SLOPE =  0.1519
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   2.25
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.195
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -       62.55      0.30     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     432.60
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.34
AVERAGE FLOW DEPTH(FEET) =   2.24   TRAVEL TIME(MIN.) =   2.34
Tc(MIN.) =   22.60
SUBAREA AREA(ACRES) =    62.55       SUBAREA RUNOFF(CFS) =  106.66
EFFECTIVE AREA(ACRES) =    269.36     AREA-AVERAGED Fm(INCH/HR) =   0.30
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =      269.4         PEAK FLOW RATE(CFS) =     459.31
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   2.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  2.32   FLOW VELOCITY(FEET/SEC.) =  13.55
LONGEST FLOWPATH FROM NODE  12111.00 TO NODE  12121.00 =    7348.90 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12115.00 TO NODE  12121.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   22.60
RAINFALL INTENSITY(INCH/HR) =   2.19
AREA-AVERAGED Fm(INCH/HR) =  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30
AREA-AVERAGED Ap =  1.00
EFFECTIVE STREAM AREA(ACRES) =     269.36
TOTAL STREAM AREA(ACRES) =     269.36
PEAK FLOW RATE(CFS) AT CONFLUENCE =     459.31

** CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3557.83   27.89    1.923  0.30( 0.30) 1.00    2347.7   12101.10
    1     3782.16   38.87    1.606  0.30( 0.30) 1.00    3156.7   12010.00
    1     3480.17   45.73    1.460  0.30( 0.30) 1.00    3281.5   12000.00
    2      459.31   22.60    2.195  0.30( 0.30) 1.00     269.4   12111.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.
```



```
** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3823.92   22.60    2.195  0.30( 0.30) 1.00    2171.4   12111.00
    2     3951.33   27.89    1.923  0.30( 0.30) 1.00    2617.1   12101.10
    3     4098.75   38.87    1.606  0.30( 0.30) 1.00    3426.1   12010.00
    4     3761.41   45.73    1.460  0.30( 0.30) 1.00    3550.8   12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    4098.75    Tc(MIN.) =    38.87
EFFECTIVE AREA(ACRES) =    3426.06   AREA-AVERAGED Fm(INCH/HR) =  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
TOTAL AREA(ACRES) =     3550.8
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12121.00 =   27614.37 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12121.00 TO NODE  12241.00 IS CODE =  56
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1215.72  DOWNSTREAM(FEET) =   1122.29
CHANNEL LENGTH THRU SUBAREA(FEET) =  3397.13   CHANNEL SLOPE =  0.0275
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =  10.40
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.512
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED               -      136.41      0.30     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4173.13
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.05
AVERAGE FLOW DEPTH(FEET) =  10.39   TRAVEL TIME(MIN.) =   4.34
Tc(MIN.) =   43.21
SUBAREA AREA(ACRES) =   136.41       SUBAREA RUNOFF(CFS) =  148.76
EFFECTIVE AREA(ACRES) =   3562.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =     3687.2         PEAK FLOW RATE(CFS) =    4098.75
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =  10.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.30   FLOW VELOCITY(FEET/SEC.) =  13.00
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)     =     3687.2  TC(MIN.) =     43.21
EFFECTIVE AREA(ACRES) =   3562.47  AREA-AVERAGED Fm(INCH/HR)=  0.30
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS)   =    4098.75

** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3823.92	27.00	1.961	0.30(0.30)	1.00	2307.8	12111.00
2	3951.33	32.26	1.774	0.30(0.30)	1.00	2753.5	12101.10
3	4098.75	43.21	1.512	0.30(0.30)	1.00	3562.5	12010.00
4	3761.41	50.17	1.371	0.30(0.30)	1.00	3687.2	12000.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S22.DAT
  TIME/DATE OF STUDY: 08:11 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.549
   2)   10.00;  3.628
   3)   15.00;  2.829
   4)   20.00;  2.353
   5)   25.00;  2.048
   6)   30.00;  1.832
   7)   40.00;  1.577
   8)   50.00;  1.373
   9)   60.00;  1.248
  10)   90.00;  1.043
  11)  120.00;  0.905
  12)  180.00;  0.750
  13)  360.00;  0.547
  14) 1440.00;  0.235
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12201.00 TO NODE  12202.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   926.94
  ELEVATION DATA: UPSTREAM(FEET) =   3077.00  DOWNSTREAM(FEET) =   2740.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.295
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.102
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,NARROWLEAF"     -        5.74      0.30     1.000      0   13.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     14.47
  TOTAL AREA(ACRES) =      5.74   PEAK FLOW RATE(CFS) =     14.47

**************************************************************************
  FLOW PROCESS FROM NODE  12202.00 TO NODE  12203.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2740.64  DOWNSTREAM(FEET) =   2551.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   832.53   CHANNEL SLOPE =  0.2271
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.795
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.85      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.73
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   2.06
  Tc(MIN.) =   15.36
  SUBAREA AREA(ACRES) =    18.85       SUBAREA RUNOFF(CFS) =   42.33
  EFFECTIVE AREA(ACRES) =     24.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       24.6          PEAK FLOW RATE(CFS) =      55.22
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   7.89
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12203.00 =    1759.47 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12203.00 TO NODE  12204.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2551.60  DOWNSTREAM(FEET) =   2151.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2056.86   CHANNEL SLOPE =  0.1944
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.476
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.93      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     137.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.22
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   3.35
  Tc(MIN.) =   18.71
  SUBAREA AREA(ACRES) =    83.93       SUBAREA RUNOFF(CFS) =  164.37
  EFFECTIVE AREA(ACRES) =    108.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      108.5         PEAK FLOW RATE(CFS) =     212.52
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =  11.71
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12204.00 =    3816.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12204.00 TO NODE  12205.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2151.76  DOWNSTREAM(FEET) =   1788.16
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2363.99   CHANNEL SLOPE =  0.1538
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.244
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      182.26      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     372.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.82
  AVERAGE FLOW DEPTH(FEET) =   2.06   TRAVEL TIME(MIN.) =   3.07
  Tc(MIN.) =   21.78
  SUBAREA AREA(ACRES) =   182.26       SUBAREA RUNOFF(CFS) =  318.94
  EFFECTIVE AREA(ACRES) =    290.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      290.8         PEAK FLOW RATE(CFS) =     508.83
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.44   FLOW VELOCITY(FEET/SEC.) =  14.03
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12205.00 =    6180.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12205.00 TO NODE  12206.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1788.16  DOWNSTREAM(FEET) =   1385.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2825.33   CHANNEL SLOPE =  0.1424
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.82
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.047
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      153.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     629.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.49
  AVERAGE FLOW DEPTH(FEET) =   2.79   TRAVEL TIME(MIN.) =   3.25
  Tc(MIN.) =   25.03
  SUBAREA AREA(ACRES) =   153.05       SUBAREA RUNOFF(CFS) =  240.60
  EFFECTIVE AREA(ACRES) =    443.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      443.8         PEAK FLOW RATE(CFS) =     697.71
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.94   FLOW VELOCITY(FEET/SEC.) =  14.93
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12206.00 =    9005.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1385.78  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3579.23   CHANNEL SLOPE =  0.1061
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.861
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      132.52      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     790.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.90
  AVERAGE FLOW DEPTH(FEET) =   3.39   TRAVEL TIME(MIN.) =   4.29
  Tc(MIN.) =   29.32
  SUBAREA AREA(ACRES) =   132.52       SUBAREA RUNOFF(CFS) =  186.21
  EFFECTIVE AREA(ACRES) =    576.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      576.4          PEAK FLOW RATE(CFS) =     809.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.43   FLOW VELOCITY(FEET/SEC.) =  14.00
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12206.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.32
  RAINFALL INTENSITY(INCH/HR) =   1.86
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     576.35
  TOTAL STREAM AREA(ACRES) =     576.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     809.87

****************************************************************************
  FLOW PROCESS FROM NODE  12211.00 TO NODE  12212.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   733.41
  ELEVATION DATA: UPSTREAM(FEET) =   1669.93  DOWNSTREAM(FEET) =   1536.26

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.893
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.006
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        8.90      0.30     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     21.67
  TOTAL AREA(ACRES) =      8.90   PEAK FLOW RATE(CFS) =     21.67

****************************************************************************
  FLOW PROCESS FROM NODE  12212.00 TO NODE  12213.00 IS CODE =  56
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1536.26  DOWNSTREAM(FEET) =   1416.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1253.05   CHANNEL SLOPE =  0.0960
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.562
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.34
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   3.91
  Tc(MIN.) =   17.80
  SUBAREA AREA(ACRES) =    17.91       SUBAREA RUNOFF(CFS) =   36.47
  EFFECTIVE AREA(ACRES) =     26.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       26.8         PEAK FLOW RATE(CFS) =      54.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   5.91
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12213.00 =    1986.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12213.00 TO NODE  12214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1416.02  DOWNSTREAM(FEET) =   1234.66
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1877.62   CHANNEL SLOPE =  0.0966
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.263
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      125.19      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     165.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.50
  AVERAGE FLOW DEPTH(FEET) =   1.50   TRAVEL TIME(MIN.) =   3.68
  Tc(MIN.) =   21.48
  SUBAREA AREA(ACRES) =   125.19       SUBAREA RUNOFF(CFS) =  221.13
  EFFECTIVE AREA(ACRES) =    152.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      152.0          PEAK FLOW RATE(CFS) =     268.49
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =   9.87
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12214.00 =    3864.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1234.66  DOWNSTREAM(FEET) =   1006.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2510.91   CHANNEL SLOPE =  0.0910
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.97
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.047
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      339.35      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     535.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.80
  AVERAGE FLOW DEPTH(FEET) =   2.88   TRAVEL TIME(MIN.) =   3.55
  Tc(MIN.) =   25.03
  SUBAREA AREA(ACRES) =   339.35       SUBAREA RUNOFF(CFS) =  533.49
  EFFECTIVE AREA(ACRES) =    491.35     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      491.4         PEAK FLOW RATE(CFS) =     772.45
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.48   FLOW VELOCITY(FEET/SEC.) =  13.07
  LONGEST FLOWPATH FROM NODE  12211.00 TO NODE  12221.00 =    6374.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12214.00 TO NODE  12221.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.03
  RAINFALL INTENSITY(INCH/HR) =   2.05
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     491.35
  TOTAL STREAM AREA(ACRES) =     491.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     772.45
```



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  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      809.87   29.32    1.861  0.30( 0.30) 1.00     576.4   12201.00
      2      772.45   25.03    2.047  0.30( 0.30) 1.00     491.4   12211.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1545.86   25.03    2.047  0.30( 0.30) 1.00     983.3   12211.00
      2     1500.30   29.32    1.861  0.30( 0.30) 1.00    1067.7   12201.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1545.86    Tc(MIN.) =    25.03
  EFFECTIVE AREA(ACRES) =     983.32   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     1067.7
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12221.00 =   12584.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1006.12  DOWNSTREAM(FEET) =    897.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.84   CHANNEL SLOPE =  0.0459
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.910
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.60      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1638.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.41
  AVERAGE FLOW DEPTH(FEET) =   6.00   TRAVEL TIME(MIN.) =   3.17
  Tc(MIN.) =   28.20
  SUBAREA AREA(ACRES) =   127.60       SUBAREA RUNOFF(CFS) =  184.86
  EFFECTIVE AREA(ACRES) =   1110.92     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1195.3         PEAK FLOW RATE(CFS) =    1609.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.95   FLOW VELOCITY(FEET/SEC.) =  12.36
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

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 FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12231.00 TO NODE  12231.50 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   553.71
 ELEVATION DATA: UPSTREAM(FEET) =   2687.04  DOWNSTREAM(FEET) =   2470.68

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.660
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.523
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL FAIR COVER
 "CHAPARRAL,NARROWLEAF"     -        3.48      0.30     1.000     0   10.66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     10.09
 TOTAL AREA(ACRES) =      3.48   PEAK FLOW RATE(CFS) =     10.09

****************************************************************************
 FLOW PROCESS FROM NODE  12231.50 TO NODE  12232.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2470.68  DOWNSTREAM(FEET) =   2375.54
 CHANNEL LENGTH THRU SUBAREA(FEET) =   410.38   CHANNEL SLOPE =  0.2318
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.41
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.345
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       12.43      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.14
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.16
 AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =   1.11
 Tc(MIN.) =   11.77
 SUBAREA AREA(ACRES) =    12.43       SUBAREA RUNOFF(CFS) =   34.07
 EFFECTIVE AREA(ACRES) =     15.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       15.9         PEAK FLOW RATE(CFS) =      43.61
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.54

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   7.31
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12232.00 =     964.09 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12232.00 TO NODE  12233.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2375.54  DOWNSTREAM(FEET) =   2252.99
 CHANNEL LENGTH THRU SUBAREA(FEET) =   939.16   CHANNEL SLOPE =  0.1305
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.83
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.986
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       17.65      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.97
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.96
 AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   2.25
 Tc(MIN.) =   14.02
 SUBAREA AREA(ACRES) =    17.65       SUBAREA RUNOFF(CFS) =   42.67
 EFFECTIVE AREA(ACRES) =     33.56     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =       33.6         PEAK FLOW RATE(CFS) =      81.13
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   0.91

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   7.52
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12233.00 =    1903.25 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12233.00 TO NODE  12234.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2252.99  DOWNSTREAM(FEET) =   2163.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =   976.53   CHANNEL SLOPE =  0.0921
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.17
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.707
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       19.54      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     102.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.20
 AVERAGE FLOW DEPTH(FEET) =   1.15   TRAVEL TIME(MIN.) =   2.26
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  Tc(MIN.) =   16.28
  SUBAREA AREA(ACRES) =    19.54       SUBAREA RUNOFF(CFS) =   42.33
  EFFECTIVE AREA(ACRES) =     53.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       53.1         PEAK FLOW RATE(CFS) =     115.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   7.48
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12234.00 =    2879.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12234.00 TO NODE  12235.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2163.07  DOWNSTREAM(FEET) =   2018.08
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1909.65   CHANNEL SLOPE =  0.0759
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.330
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.14      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     161.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.77
  AVERAGE FLOW DEPTH(FEET) =   1.58   TRAVEL TIME(MIN.) =   4.10
  Tc(MIN.) =   20.37
  SUBAREA AREA(ACRES) =    51.14       SUBAREA RUNOFF(CFS) =   93.44
  EFFECTIVE AREA(ACRES) =    104.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      104.2         PEAK FLOW RATE(CFS) =     190.47
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.73   FLOW VELOCITY(FEET/SEC.) =   8.19
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12235.00 =    4789.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12235.00 TO NODE  12236.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2018.08  DOWNSTREAM(FEET) =   1607.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.94   CHANNEL SLOPE =  0.2162
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.45
```



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  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.175
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     230.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.46
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   2.54
  Tc(MIN.) =   22.91
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =   80.07
  EFFECTIVE AREA(ACRES) =    151.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =     256.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.52   FLOW VELOCITY(FEET/SEC.) =  12.89
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12236.00 =    6686.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12236.00 TO NODE  12237.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1607.89  DOWNSTREAM(FEET) =   1326.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2213.20   CHANNEL SLOPE =  0.1273
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.000
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     322.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.49
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   3.21
  Tc(MIN.) =   26.12
  SUBAREA AREA(ACRES) =    87.00       SUBAREA RUNOFF(CFS) =  133.08
  EFFECTIVE AREA(ACRES) =    238.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      238.7         PEAK FLOW RATE(CFS) =     365.10
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.15   FLOW VELOCITY(FEET/SEC.) =  11.90
  LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12237.00 =    8899.57 FEET.

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 FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1326.23  DOWNSTREAM(FEET) =   1122.29
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2236.51   CHANNEL SLOPE =  0.0912
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.55
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.854
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       81.83      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     422.34
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.04
 AVERAGE FLOW DEPTH(FEET) =   2.54   TRAVEL TIME(MIN.) =   3.38
 Tc(MIN.) =   29.50
 SUBAREA AREA(ACRES) =    81.83       SUBAREA RUNOFF(CFS) =  114.43
 EFFECTIVE AREA(ACRES) =    320.51     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      320.5         PEAK FLOW RATE(CFS) =     448.19
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.62

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.62   FLOW VELOCITY(FEET/SEC.) =  11.23
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: S21.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     3823.92   27.00  0.30( 0.30) 1.00    2307.8   12111.00
     2     3951.33   32.26  0.30( 0.30) 1.00    2753.5   12101.10
     3     4098.75   43.21  0.30( 0.30) 1.00    3562.5   12010.00
     4     3761.41   50.17  0.30( 0.30) 1.00    3687.2   12000.00
   TOTAL AREA(ACRES) =     3687.2

****************************************************************************
 FLOW PROCESS FROM NODE  12241.00 TO NODE  12241.00 IS CODE = 14.0
----------------------------------------------------------------------------
 >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
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============================================================================

 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
     1     3823.92   27.00  0.30( 0.30) 1.00    2307.8   12111.00
     2     3951.33   32.26  0.30( 0.30) 1.00    2753.5   12101.10
     3     4098.75   43.21  0.30( 0.30) 1.00    3562.5   12010.00
     4     3761.41   50.17  0.30( 0.30) 1.00    3687.2   12000.00
   TOTAL AREA(ACRES) =      3687.2

****************************************************************************
 FLOW PROCESS FROM NODE  12237.00 TO NODE  12241.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3823.92   27.00    1.961  0.30( 0.30) 1.00    2307.8   12111.00
     2     3951.33   32.26    1.774  0.30( 0.30) 1.00    2753.5   12101.10
     3     4098.75   43.21    1.512  0.30( 0.30) 1.00    3562.5   12010.00
     4     3761.41   50.17    1.371  0.30( 0.30) 1.00    3687.2   12000.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      448.19   29.50    1.854  0.30( 0.30) 1.00     320.5   12231.00
 LONGEST FLOWPATH FROM NODE  12231.00 TO NODE  12241.00 =   11136.08 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     4262.67   27.00    1.961  0.30( 0.30) 1.00    2601.2   12111.00
     2     4332.51   29.50    1.854  0.30( 0.30) 1.00    2839.6   12231.00
     3     4376.61   32.26    1.774  0.30( 0.30) 1.00    3074.0   12101.10
     4     4448.27   43.21    1.512  0.30( 0.30) 1.00    3883.0   12010.00
     5     4070.33   50.17    1.371  0.30( 0.30) 1.00    4007.7   12000.00
   TOTAL AREA(ACRES) =      4007.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     4448.27  Tc(MIN.) =   43.206
 EFFECTIVE AREA(ACRES) =   3882.98  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     4007.7
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12241.00 =   31011.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12241.00 TO NODE  12242.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1122.29  DOWNSTREAM(FEET) =   1062.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2053.03   CHANNEL SLOPE =  0.0291
 GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
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"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   8.98
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.460
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -      219.09      0.30     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4562.61
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.43
AVERAGE FLOW DEPTH(FEET) =   8.96   TRAVEL TIME(MIN.) =   2.55
Tc(MIN.) =   45.75
SUBAREA AREA(ACRES) =   219.09       SUBAREA RUNOFF(CFS) =  228.67
EFFECTIVE AREA(ACRES) =   4102.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =     4226.8         PEAK FLOW RATE(CFS) =    4448.27
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   8.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  8.85   FLOW VELOCITY(FEET/SEC.) =  13.33
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12242.00 =   33064.53 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12242.00 TO NODE  12243.00 IS CODE =  56
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1062.50  DOWNSTREAM(FEET) =    998.53
CHANNEL LENGTH THRU SUBAREA(FEET) =  1931.30   CHANNEL SLOPE =  0.0331
GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   8.70
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.413
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -      249.96      0.30     0.995     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.995
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4573.64
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.07
AVERAGE FLOW DEPTH(FEET) =   8.69   TRAVEL TIME(MIN.) =   2.29
Tc(MIN.) =   48.04
SUBAREA AREA(ACRES) =   249.96       SUBAREA RUNOFF(CFS) =  250.73
EFFECTIVE AREA(ACRES) =   4352.03     AREA-AVERAGED Fm(INCH/HR) =   0.30
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =     4476.8         PEAK FLOW RATE(CFS) =    4448.27
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   8.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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DEPTH(FEET) =  8.57   FLOW VELOCITY(FEET/SEC.) =  13.97
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12243.00 =   34995.83 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12243.00 TO NODE  12244.00 IS CODE =  56
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    998.53  DOWNSTREAM(FEET) =    926.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  1863.28   CHANNEL SLOPE =  0.0389
GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   8.31
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.371
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -      166.97      0.30     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4528.78
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.89
AVERAGE FLOW DEPTH(FEET) =   8.31   TRAVEL TIME(MIN.) =   2.09
Tc(MIN.) =   50.13
SUBAREA AREA(ACRES) =   166.97       SUBAREA RUNOFF(CFS) =  161.02
EFFECTIVE AREA(ACRES) =   4519.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
TOTAL AREA(ACRES) =     4643.8         PEAK FLOW RATE(CFS) =    4448.27
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   8.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  8.23   FLOW VELOCITY(FEET/SEC.) =  14.83
LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12244.00 =   36859.11 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  12244.00 TO NODE  12251.00 IS CODE =  56
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    926.00  DOWNSTREAM(FEET) =    897.69
CHANNEL LENGTH THRU SUBAREA(FEET) =  1665.37   CHANNEL SLOPE =  0.0170
GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
"Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =  10.16
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.340
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -       83.41      0.30     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4487.30
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.97
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  AVERAGE FLOW DEPTH(FEET) =  10.15   TRAVEL TIME(MIN.) =   2.53
  Tc(MIN.) =   52.66
  SUBAREA AREA(ACRES) =    83.41       SUBAREA RUNOFF(CFS) =   78.06
  EFFECTIVE AREA(ACRES) =   4602.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     4727.2         PEAK FLOW RATE(CFS) =    4448.27
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.11   FLOW VELOCITY(FEET/SEC.) =  10.94
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12221.00 TO NODE  12251.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4262.67   36.55    1.665  0.30( 0.30) 1.00    3320.7   12111.00
      2     4332.51   39.00    1.602  0.30( 0.30) 1.00    3559.0   12231.00
      3     4376.61   41.74    1.541  0.30( 0.30) 1.00    3793.4   12101.10
      4     4448.27   52.66    1.340  0.30( 0.30) 1.00    4602.4   12010.00
      5     4105.99   59.84    1.250  0.30( 0.30) 1.00    4727.2   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1609.43   28.20    1.910  0.30( 0.30) 1.00    1110.9   12211.00
      2     1578.98   32.52    1.768  0.30( 0.30) 1.00    1195.3   12201.00
  LONGEST FLOWPATH FROM NODE  12201.00 TO NODE  12251.00 =   14947.72 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5488.22   28.20    1.910  0.30( 0.30) 1.00    3673.5   12211.00
      2     5657.38   32.52    1.768  0.30( 0.30) 1.00    4150.3   12201.00
      3     5731.25   36.55    1.665  0.30( 0.30) 1.00    4516.0   12111.00
      4     5733.65   39.00    1.602  0.30( 0.30) 1.00    4754.3   12231.00
      5     5712.15   41.74    1.541  0.30( 0.30) 1.00    4988.7   12101.10
      6     5566.91   52.66    1.340  0.30( 0.30) 1.00    5797.7   12010.00
      7     5128.01   59.84    1.250  0.30( 0.30) 1.00    5922.5   12000.00
    TOTAL AREA(ACRES) =      5922.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5733.65  Tc(MIN.) =   39.005
  EFFECTIVE AREA(ACRES) =   4754.34  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     5922.5
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12251.00 =   38524.48 FEET.

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  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    897.69  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2133.08   CHANNEL SLOPE =  0.0238
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.543
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.79      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5781.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.27
  AVERAGE FLOW DEPTH(FEET) =  10.58   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   41.68
  SUBAREA AREA(ACRES) =    85.79       SUBAREA RUNOFF(CFS) =   95.95
  EFFECTIVE AREA(ACRES) =   4840.13     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     6008.3         PEAK FLOW RATE(CFS) =    5733.65
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   20.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.54   FLOW VELOCITY(FEET/SEC.) =  13.24
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12281.00 =   40657.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12251.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.68
  RAINFALL INTENSITY(INCH/HR) =   1.54
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    4840.13
  TOTAL STREAM AREA(ACRES) =    6008.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    5733.65

****************************************************************************
  FLOW PROCESS FROM NODE  12261.00 TO NODE  12261.50 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   378.71
  ELEVATION DATA: UPSTREAM(FEET) =   2264.27  DOWNSTREAM(FEET) =   2072.51
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.694
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.130
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        2.96      0.30     1.000     0    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.20
  TOTAL AREA(ACRES) =      2.96   PEAK FLOW RATE(CFS) =     10.20

****************************************************************************
  FLOW PROCESS FROM NODE  12261.50 TO NODE  12262.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2072.51  DOWNSTREAM(FEET) =   1875.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   609.41   CHANNEL SLOPE =  0.3233
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.594
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        9.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.69
  AVERAGE FLOW DEPTH(FEET) =   0.35   TRAVEL TIME(MIN.) =   1.52
  Tc(MIN.) =   10.21
  SUBAREA AREA(ACRES) =     9.89       SUBAREA RUNOFF(CFS) =   29.32
  EFFECTIVE AREA(ACRES) =     12.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.9         PEAK FLOW RATE(CFS) =      38.09
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   7.71
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12262.00 =     988.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12262.00 TO NODE  12263.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1875.51  DOWNSTREAM(FEET) =   1686.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.89   CHANNEL SLOPE =  0.1957
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.275
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       22.00      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      67.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.08
  AVERAGE FLOW DEPTH(FEET) =   0.73   TRAVEL TIME(MIN.) =   2.00
  Tc(MIN.) =   12.21
  SUBAREA AREA(ACRES) =    22.00       SUBAREA RUNOFF(CFS) =   58.91
  EFFECTIVE AREA(ACRES) =     34.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       34.8         PEAK FLOW RATE(CFS) =      93.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   8.99
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12263.00 =    1956.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12263.00 TO NODE  12264.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1686.10  DOWNSTREAM(FEET) =   1572.93
  CHANNEL LENGTH THRU SUBAREA(FEET) =   944.28   CHANNEL SLOPE =  0.1198
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.984
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       35.72      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     136.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.64
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =   1.82
  Tc(MIN.) =   14.03
  SUBAREA AREA(ACRES) =    35.72       SUBAREA RUNOFF(CFS) =   86.28
  EFFECTIVE AREA(ACRES) =     70.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       70.6         PEAK FLOW RATE(CFS) =     170.47
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOW VELOCITY(FEET/SEC.) =   9.26
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12264.00 =    2900.29 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12264.00 TO NODE  12265.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1572.93  DOWNSTREAM(FEET) =   1506.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =   569.03   CHANNEL SLOPE =  0.1169
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.831
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.21      0.30     0.886     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.886
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     220.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.92
  AVERAGE FLOW DEPTH(FEET) =   1.67   TRAVEL TIME(MIN.) =   0.96
  Tc(MIN.) =   14.99
  SUBAREA AREA(ACRES) =    43.21       SUBAREA RUNOFF(CFS) =   99.77
  EFFECTIVE AREA(ACRES) =    113.78     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =      113.8         PEAK FLOW RATE(CFS) =     260.53
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =  10.45
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12265.00 =    3469.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12265.00 TO NODE  12266.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1506.41  DOWNSTREAM(FEET) =   1311.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2121.93   CHANNEL SLOPE =  0.0920
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.508
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.55      0.30     0.710     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.710
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     347.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.46
  AVERAGE FLOW DEPTH(FEET) =   2.28   TRAVEL TIME(MIN.) =   3.38
  Tc(MIN.) =   18.37
  SUBAREA AREA(ACRES) =    84.55       SUBAREA RUNOFF(CFS) =  174.67
  EFFECTIVE AREA(ACRES) =    198.33     AREA-AVERAGED Fm(INCH/HR) =   0.26
```



```
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.85
  TOTAL AREA(ACRES) =      198.3         PEAK FLOW RATE(CFS) =     402.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.47   FLOW VELOCITY(FEET/SEC.) =  10.91
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12266.00 =    5591.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12266.00 TO NODE  12267.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1311.17  DOWNSTREAM(FEET) =   1232.47
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1555.18   CHANNEL SLOPE =  0.0506
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.288
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      160.37      0.30     0.633     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.633
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     553.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.63
  AVERAGE FLOW DEPTH(FEET) =   3.42   TRAVEL TIME(MIN.) =   2.69
  Tc(MIN.) =   21.06
  SUBAREA AREA(ACRES) =   160.37       SUBAREA RUNOFF(CFS) =  302.89
  EFFECTIVE AREA(ACRES) =    358.70     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.75
  TOTAL AREA(ACRES) =      358.7         PEAK FLOW RATE(CFS) =     665.77
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.75   FLOW VELOCITY(FEET/SEC.) =  10.14
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12267.00 =    7146.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12267.00 TO NODE  12268.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1232.47  DOWNSTREAM(FEET) =   1141.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2111.19   CHANNEL SLOPE =  0.0430
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.18
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.070
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      100.65      0.30     0.970     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.970
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     746.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.84
  AVERAGE FLOW DEPTH(FEET) =   4.15   TRAVEL TIME(MIN.) =   3.57
  Tc(MIN.) =   24.63
  SUBAREA AREA(ACRES) =   100.65       SUBAREA RUNOFF(CFS) =  161.19
  EFFECTIVE AREA(ACRES) =    459.35     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      459.4         PEAK FLOW RATE(CFS) =     756.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.17   FLOW VELOCITY(FEET/SEC.) =   9.89
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12268.00 =    9257.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12268.00 TO NODE  12269.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1141.79  DOWNSTREAM(FEET) =   1115.83
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1295.17   CHANNEL SLOPE =  0.0200
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.942
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -      103.26      0.30     0.838     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.838
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     835.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.67
  AVERAGE FLOW DEPTH(FEET) =   5.29   TRAVEL TIME(MIN.) =   2.81
  Tc(MIN.) =   27.45
  SUBAREA AREA(ACRES) =   103.26       SUBAREA RUNOFF(CFS) =  157.14
  EFFECTIVE AREA(ACRES) =    562.61     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      562.6         PEAK FLOW RATE(CFS) =     860.76
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.37   FLOW VELOCITY(FEET/SEC.) =   7.73
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.00 =   10552.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.00 TO NODE  12269.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1115.83  DOWNSTREAM(FEET) =   1100.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1137.63   CHANNEL SLOPE =  0.0139
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.99
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.826
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       50.20      0.30     0.708     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.708
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     897.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.83
  AVERAGE FLOW DEPTH(FEET) =   5.98   TRAVEL TIME(MIN.) =   2.77
  Tc(MIN.) =   30.22
  SUBAREA AREA(ACRES) =    50.20       SUBAREA RUNOFF(CFS) =   72.92
  EFFECTIVE AREA(ACRES) =    612.81     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      612.8         PEAK FLOW RATE(CFS) =     874.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.91   FLOW VELOCITY(FEET/SEC.) =   6.79
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12269.50 =   11690.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12269.50 TO NODE  12270.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1091.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1219.38   CHANNEL SLOPE =  0.0073
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.731
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       98.30      0.30     0.583     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.583
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     943.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.46
  AVERAGE FLOW DEPTH(FEET) =   7.13   TRAVEL TIME(MIN.) =   3.72
  Tc(MIN.) =   33.95
  SUBAREA AREA(ACRES) =    98.30       SUBAREA RUNOFF(CFS) =  137.71
  EFFECTIVE AREA(ACRES) =    711.11     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      711.1         PEAK FLOW RATE(CFS) =     960.32
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.18   FLOW VELOCITY(FEET/SEC.) =   5.49
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12270.00 =   12909.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12270.00 TO NODE  12271.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1091.06  DOWNSTREAM(FEET) =    962.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1995.19   CHANNEL SLOPE =  0.0646
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.664
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.93      0.30     0.746     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.746
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1078.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.62
  AVERAGE FLOW DEPTH(FEET) =   4.50   TRAVEL TIME(MIN.) =   2.64
  Tc(MIN.) =   36.58
  SUBAREA AREA(ACRES) =   181.93       SUBAREA RUNOFF(CFS) =  235.85
  EFFECTIVE AREA(ACRES) =    893.04     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.76
  TOTAL AREA(ACRES) =      893.0         PEAK FLOW RATE(CFS) =    1153.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.65   FLOW VELOCITY(FEET/SEC.) =  12.84
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12271.00 =   14904.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12271.00 TO NODE  12272.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    962.23  DOWNSTREAM(FEET) =    917.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1613.85   CHANNEL SLOPE =  0.0278
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.99
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.593
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      181.79      0.30     0.910     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.910
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1261.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.65
  AVERAGE FLOW DEPTH(FEET) =   5.96   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   39.37
  SUBAREA AREA(ACRES) =   181.79       SUBAREA RUNOFF(CFS) =  215.99
  EFFECTIVE AREA(ACRES) =   1074.83     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.79
  TOTAL AREA(ACRES) =     1074.8         PEAK FLOW RATE(CFS) =    1312.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.08   FLOW VELOCITY(FEET/SEC.) =   9.74
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12272.00 =   16518.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    917.38  DOWNSTREAM(FEET) =    846.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3182.34   CHANNEL SLOPE =  0.0221
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.53
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.470
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.99      0.30     0.948     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.948
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1354.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.03
  AVERAGE FLOW DEPTH(FEET) =   6.51   TRAVEL TIME(MIN.) =   5.87
  Tc(MIN.) =   45.24
  SUBAREA AREA(ACRES) =    79.99       SUBAREA RUNOFF(CFS) =   85.36
  EFFECTIVE AREA(ACRES) =   1154.82     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     1154.8         PEAK FLOW RATE(CFS) =    1312.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.42   FLOW VELOCITY(FEET/SEC.) =   8.95
  LONGEST FLOWPATH FROM NODE  12261.00 TO NODE  12281.00 =   19701.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12272.00 TO NODE  12281.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 45.24
RAINFALL INTENSITY(INCH/HR) = 1.47
AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.80
EFFECTIVE STREAM AREA(ACRES) = 1154.82
TOTAL STREAM AREA(ACRES) = 1154.82
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1312.00

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5488.22	30.91	1.809	0.30(0.30)	1.00	3759.3	12211.00
1	5657.38	35.21	1.699	0.30(0.30)	1.00	4236.1	12201.00
1	5731.25	39.23	1.597	0.30(0.30)	1.00	4601.8	12111.00
1	5733.65	41.68	1.543	0.30(0.30)	1.00	4840.1	12231.00
1	5712.15	44.43	1.487	0.30(0.30)	1.00	5074.5	12101.10
1	5566.91	55.36	1.306	0.30(0.30)	1.00	5883.5	12010.00
1	5128.01	62.60	1.230	0.30(0.30)	1.00	6008.3	12000.00
2	1312.00	45.24	1.470	0.30(0.24)	0.80	1154.8	12261.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6631.48	30.91	1.809	0.30(0.29)	0.97	4548.3	12211.00
2	6868.61	35.21	1.699	0.30(0.29)	0.96	5134.8	12201.00
3	6985.95	39.23	1.597	0.30(0.29)	0.96	5603.1	12111.00
4	7013.81	41.68	1.543	0.30(0.29)	0.96	5904.2	12231.00
5	7017.94	44.43	1.487	0.30(0.29)	0.96	6208.5	12101.10
6	7013.33	45.24	1.470	0.30(0.29)	0.96	6289.6	12261.00
7	6703.91	55.36	1.306	0.30(0.29)	0.97	7038.3	12010.00
8	6184.15	62.60	1.230	0.30(0.29)	0.97	7163.1	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 7017.94 Tc(MIN.) = 44.43
EFFECTIVE AREA(ACRES) = 6208.54 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7163.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

****
FLOW PROCESS FROM NODE 12281.00 TO NODE 12282.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 846.91 DOWNSTREAM(FEET) = 835.60
CHANNEL LENGTH THRU SUBAREA(FEET) = 1561.00 CHANNEL SLOPE = 0.0072
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 15.54
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.428
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	267.56	0.30	0.867	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7158.55
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.03
AVERAGE FLOW DEPTH(FEET) = 15.53 TRAVEL TIME(MIN.) = 2.88
Tc(MIN.) = 47.31
SUBAREA AREA(ACRES) = 267.56 SUBAREA RUNOFF(CFS) = 281.23
EFFECTIVE AREA(ACRES) = 6476.10 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 7430.6 PEAK FLOW RATE(CFS) = 7017.94
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 15.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 15.39 FLOW VELOCITY(FEET/SEC.) = 8.98
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12282.00 = 42218.56 FEET.
==========
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 7430.6 TC(MIN.) = 47.31
EFFECTIVE AREA(ACRES) = 6476.10 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.959
PEAK FLOW RATE(CFS) = 7017.94

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6631.48	33.83	1.734	0.30(0.29)	0.96	4815.9	12211.00
2	6868.61	38.10	1.625	0.30(0.29)	0.96	5402.4	12201.00
3	6985.95	42.11	1.534	0.30(0.29)	0.96	5870.6	12111.00
4	7013.81	44.57	1.484	0.30(0.29)	0.96	6171.7	12231.00
5	7017.94	47.31	1.428	0.30(0.29)	0.96	6476.1	12101.10
6	7013.33	48.12	1.411	0.30(0.29)	0.96	6557.1	12261.00
7	6703.91	58.27	1.270	0.30(0.29)	0.96	7305.9	12010.00
8	6184.15	65.58	1.210	0.30(0.29)	0.96	7430.6	12000.00

==========
==========
END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S23.DAT
  TIME/DATE OF STUDY: 08:12 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.549
   2)   10.00;  3.628
   3)   15.00;  2.829
   4)   20.00;  2.353
   5)   25.00;  2.048
   6)   30.00;  1.832
   7)   40.00;  1.577
   8)   50.00;  1.373
   9)   60.00;  1.248
  10)   90.00;  1.043
  11)  120.00;  0.905
  12)  180.00;  0.750
  13)  360.00;  0.547
  14) 1440.00;  0.235
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12300.00 TO NODE  12301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   924.36
  ELEVATION DATA: UPSTREAM(FEET) =   1712.53  DOWNSTREAM(FEET) =   1490.12

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.417
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.922
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.30     1.000      0   14.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     15.72
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =     15.72

**************************************************************************
  FLOW PROCESS FROM NODE  12301.00 TO NODE  12302.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1490.12  DOWNSTREAM(FEET) =   1117.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1564.45   CHANNEL SLOPE =  0.2380
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.66
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.579
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.97      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.12
  AVERAGE FLOW DEPTH(FEET) =   0.62   TRAVEL TIME(MIN.) =   3.21
  Tc(MIN.) =   17.63
  SUBAREA AREA(ACRES) =    39.97       SUBAREA RUNOFF(CFS) =   81.98
  EFFECTIVE AREA(ACRES) =     46.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       46.6          PEAK FLOW RATE(CFS) =      95.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) =   9.70
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12302.00 =    2488.81 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1117.78  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2216.41   CHANNEL SLOPE =  0.1520
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.260
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     141.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.46
  AVERAGE FLOW DEPTH(FEET) =   1.20   TRAVEL TIME(MIN.) =   3.90
  Tc(MIN.) =   21.53
  SUBAREA AREA(ACRES) =    51.51       SUBAREA RUNOFF(CFS) =   90.85
  EFFECTIVE AREA(ACRES) =     98.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       98.1         PEAK FLOW RATE(CFS) =     173.09
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.35   FLOW VELOCITY(FEET/SEC.) =  10.12
  LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S22.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     6631.48   33.83  0.30( 0.29) 0.96    4815.9   12211.00
      2     6868.61   38.10  0.30( 0.29) 0.96    5402.4   12201.00
      3     6985.95   42.11  0.30( 0.29) 0.96    5870.6   12111.00
      4     7013.81   44.57  0.30( 0.29) 0.96    6171.7   12231.00
      5     7017.94   47.31  0.30( 0.29) 0.96    6476.1   12101.10
      6     7013.33   48.12  0.30( 0.29) 0.96    6557.1   12261.00
      7     6703.91   58.27  0.30( 0.29) 0.96    7305.9   12010.00
      8     6184.15   65.58  0.30( 0.29) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
```



```
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12282.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     6631.48   33.83  0.30( 0.29) 0.96    4815.9   12211.00
      2     6868.61   38.10  0.30( 0.29) 0.96    5402.4   12201.00
      3     6985.95   42.11  0.30( 0.29) 0.96    5870.6   12111.00
      4     7013.81   44.57  0.30( 0.29) 0.96    6171.7   12231.00
      5     7017.94   47.31  0.30( 0.29) 0.96    6476.1   12101.10
      6     7013.33   48.12  0.30( 0.29) 0.96    6557.1   12261.00
      7     6703.91   58.27  0.30( 0.29) 0.96    7305.9   12010.00
      8     6184.15   65.58  0.30( 0.29) 0.96    7430.6   12000.00
    TOTAL AREA(ACRES) =     7430.6

****************************************************************************
  FLOW PROCESS FROM NODE  12282.00 TO NODE  12320.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    835.60  DOWNSTREAM(FEET) =    780.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1568.10   CHANNEL SLOPE =  0.0349
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.392
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       51.15      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7043.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.73
  AVERAGE FLOW DEPTH(FEET) =   8.58   TRAVEL TIME(MIN.) =   1.77
  Tc(MIN.) =   49.08
  SUBAREA AREA(ACRES) =    51.15       SUBAREA RUNOFF(CFS) =   50.26
  EFFECTIVE AREA(ACRES) =   6527.25     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     7481.8         PEAK FLOW RATE(CFS) =    7017.94
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.56   FLOW VELOCITY(FEET/SEC.) =  14.72
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12302.00 TO NODE  12320.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      6631.48   35.63    1.688  0.30( 0.29) 0.96    4867.0   12211.00
     2      6868.61   39.89    1.580  0.30( 0.29) 0.96    5453.5   12201.00
     3      6985.95   43.89    1.498  0.30( 0.29) 0.96    5921.8   12111.00
     4      7013.81   46.34    1.448  0.30( 0.29) 0.96    6222.9   12231.00
     5      7017.94   49.08    1.392  0.30( 0.29) 0.96    6527.2   12101.10
     6      7013.33   49.90    1.375  0.30( 0.29) 0.96    6608.3   12261.00
     7      6703.91   60.07    1.248  0.30( 0.29) 0.96    7357.0   12010.00
     8      6184.15   67.42    1.197  0.30( 0.29) 0.96    7481.8   12000.00
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       173.09   21.53    2.260  0.30( 0.30) 1.00      98.1   12300.00
 LONGEST FLOWPATH FROM NODE  12300.00 TO NODE  12320.00 =    4705.22 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      5814.82   21.53    2.260  0.30( 0.29) 0.96    3039.2   12300.00
     2      6754.12   35.63    1.688  0.30( 0.29) 0.96    4965.2   12211.00
     3      6981.67   39.89    1.580  0.30( 0.29) 0.96    5551.7   12201.00
     4      7091.74   43.89    1.498  0.30( 0.29) 0.96    6019.9   12111.00
     5      7115.19   46.34    1.448  0.30( 0.29) 0.96    6321.0   12231.00
     6      7114.37   49.08    1.392  0.30( 0.29) 0.96    6625.4   12101.10
     7      7108.30   49.90    1.375  0.30( 0.29) 0.96    6706.4   12261.00
     8      6787.60   60.07    1.248  0.30( 0.29) 0.96    7455.2   12010.00
     9      6263.41   67.42    1.197  0.30( 0.29) 0.96    7579.9   12000.00
   TOTAL AREA(ACRES) =      7579.9

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     7115.19  Tc(MIN.) =   46.340
 EFFECTIVE AREA(ACRES) =   6321.02  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     7579.9
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12320.00 =   43786.66 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12320.00 TO NODE  12321.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    780.80  DOWNSTREAM(FEET) =    761.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2102.41   CHANNEL SLOPE =  0.0091
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  12.05
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.370
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      180.82      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7202.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.05
 AVERAGE FLOW DEPTH(FEET) =  12.03   TRAVEL TIME(MIN.) =   3.87
 Tc(MIN.) =   50.21
 SUBAREA AREA(ACRES) =   180.82       SUBAREA RUNOFF(CFS) =  174.20
 EFFECTIVE AREA(ACRES) =   6501.84     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     7760.8          PEAK FLOW RATE(CFS) =    7115.19
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.97

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 11.97   FLOW VELOCITY(FEET/SEC.) =   9.02
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12321.00 =   45889.07 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12321.00 TO NODE  12322.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    761.66  DOWNSTREAM(FEET) =    710.30
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1916.13   CHANNEL SLOPE =  0.0268
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.28
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.341
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      217.17      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7216.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.46
 AVERAGE FLOW DEPTH(FEET) =   9.27   TRAVEL TIME(MIN.) =   2.37
 Tc(MIN.) =   52.58
 SUBAREA AREA(ACRES) =   217.17       SUBAREA RUNOFF(CFS) =  203.42
 EFFECTIVE AREA(ACRES) =   6719.01     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     7977.9          PEAK FLOW RATE(CFS) =    7115.19
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   9.21

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  9.21   FLOW VELOCITY(FEET/SEC.) =  13.41
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12322.00 =   47805.20 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    710.30  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1977.07   CHANNEL SLOPE =  0.0162
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.48
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.304
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      194.67      0.30     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7203.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.20
  AVERAGE FLOW DEPTH(FEET) =  10.47   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   55.53
  SUBAREA AREA(ACRES) =   194.67       SUBAREA RUNOFF(CFS) =  175.96
  EFFECTIVE AREA(ACRES) =   6913.68     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     8172.6         PEAK FLOW RATE(CFS) =    7115.19
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.41   FLOW VELOCITY(FEET/SEC.) =  11.16
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12322.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   55.53
  RAINFALL INTENSITY(INCH/HR) =   1.30
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96
  EFFECTIVE STREAM AREA(ACRES) =    6913.68
  TOTAL STREAM AREA(ACRES) =    8172.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    7115.19

****************************************************************************
  FLOW PROCESS FROM NODE  12330.00 TO NODE  12331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   994.42
  ELEVATION DATA: UPSTREAM(FEET) =   1754.00  DOWNSTREAM(FEET) =   1530.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.046
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.825
```



```
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        3.33      0.30     1.000     0   15.05
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.57
  TOTAL AREA(ACRES) =      3.33   PEAK FLOW RATE(CFS) =      7.57

****************************************************************************
  FLOW PROCESS FROM NODE  12331.00 TO NODE  12332.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1530.30  DOWNSTREAM(FEET) =   1412.81
  CHANNEL LENGTH THRU SUBAREA(FEET) =   946.66   CHANNEL SLOPE =  0.1241
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.558
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.08      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.62
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   2.81
  Tc(MIN.) =   17.85
  SUBAREA AREA(ACRES) =    28.08       SUBAREA RUNOFF(CFS) =   57.05
  EFFECTIVE AREA(ACRES) =     31.41     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       31.4         PEAK FLOW RATE(CFS) =      63.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOW VELOCITY(FEET/SEC.) =   6.82
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12332.00 =    1941.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12332.00 TO NODE  12333.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1412.81  DOWNSTREAM(FEET) =   1235.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1959.37   CHANNEL SLOPE =  0.0907
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.206
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED             -       44.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     102.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.15
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   4.57
  Tc(MIN.) =   22.42
  SUBAREA AREA(ACRES) =    44.96       SUBAREA RUNOFF(CFS) =   77.11
  EFFECTIVE AREA(ACRES) =     76.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.4         PEAK FLOW RATE(CFS) =     130.98
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.33   FLOW VELOCITY(FEET/SEC.) =   7.76
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12333.00 =    3900.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12333.00 TO NODE  12334.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1235.19  DOWNSTREAM(FEET) =   1013.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1921.81   CHANNEL SLOPE =  0.1151
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.003
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.86
  AVERAGE FLOW DEPTH(FEET) =   1.37   TRAVEL TIME(MIN.) =   3.62
  Tc(MIN.) =   26.03
  SUBAREA AREA(ACRES) =    30.50       SUBAREA RUNOFF(CFS) =   46.76
  EFFECTIVE AREA(ACRES) =    106.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      106.9         PEAK FLOW RATE(CFS) =     163.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.42   FLOW VELOCITY(FEET/SEC.) =   9.02
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12334.00 =    5822.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12334.00 TO NODE  12335.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1013.96  DOWNSTREAM(FEET) =    809.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2029.80   CHANNEL SLOPE =  0.1006
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.96
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.857
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      145.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     266.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.98
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   3.39
  Tc(MIN.) =   29.42
  SUBAREA AREA(ACRES) =   145.82       SUBAREA RUNOFF(CFS) =  204.33
  EFFECTIVE AREA(ACRES) =    252.69     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      252.7         PEAK FLOW RATE(CFS) =     354.08
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.25   FLOW VELOCITY(FEET/SEC.) =  10.87
  LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12335.00 =    7852.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    809.84  DOWNSTREAM(FEET) =    678.19
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1905.44   CHANNEL SLOPE =  0.0691
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.62
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.764
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       50.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     387.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.74
  AVERAGE FLOW DEPTH(FEET) =   2.61   TRAVEL TIME(MIN.) =   3.26
  Tc(MIN.) =   32.68
  SUBAREA AREA(ACRES) =    50.71       SUBAREA RUNOFF(CFS) =   66.80
  EFFECTIVE AREA(ACRES) =    303.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      303.4         PEAK FLOW RATE(CFS) =     399.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```

```
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.65

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.65   FLOW VELOCITY(FEET/SEC.) =   9.85
 LONGEST FLOWPATH FROM NODE  12330.00 TO NODE  12340.00 =    9757.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12335.00 TO NODE  12340.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   32.68
 RAINFALL INTENSITY(INCH/HR) =   1.76
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     303.40
 TOTAL STREAM AREA(ACRES) =     303.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     399.66

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5814.82   31.20    1.802  0.30( 0.29) 0.97    3631.9   12300.00
     1     6754.12   44.94    1.476  0.30( 0.29) 0.97    5557.8   12211.00
     1     6981.67   49.11    1.391  0.30( 0.29) 0.96    6144.3   12201.00
     1     7091.74   53.08    1.335  0.30( 0.29) 0.96    6612.6   12111.00
     1     7115.19   55.53    1.304  0.30( 0.29) 0.96    6913.7   12231.00
     1     7114.37   58.27    1.270  0.30( 0.29) 0.96    7218.0   12101.10
     1     7108.30   59.08    1.259  0.30( 0.29) 0.96    7299.1   12261.00
     1     6787.60   69.37    1.184  0.30( 0.29) 0.97    8047.8   12010.00
     1     6263.41   76.92    1.132  0.30( 0.29) 0.97    8172.6   12000.00
     2      399.66   32.68    1.764  0.30( 0.30) 1.00     303.4   12330.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     6206.18   31.20    1.802  0.30( 0.29) 0.97    3921.5   12300.00
     2     6316.16   32.68    1.764  0.30( 0.29) 0.97    4143.8   12330.00
     3     7075.33   44.94    1.476  0.30( 0.29) 0.97    5861.2   12211.00
     4     7279.61   49.11    1.391  0.30( 0.29) 0.97    6447.7   12201.00
     5     7374.25   53.08    1.335  0.30( 0.29) 0.97    6916.0   12111.00
     6     7389.34   55.53    1.304  0.30( 0.29) 0.97    7217.1   12231.00
     7     7379.15   58.27    1.270  0.30( 0.29) 0.96    7521.4   12101.10
     8     7370.30   59.08    1.259  0.30( 0.29) 0.96    7602.5   12261.00
     9     7028.99   69.37    1.184  0.30( 0.29) 0.97    8351.2   12010.00
    10     6490.72   76.92    1.132  0.30( 0.29) 0.97    8476.0   12000.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    7389.34    Tc(MIN.) =    55.53
 EFFECTIVE AREA(ACRES) =    7217.08   AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
```



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 TOTAL AREA(ACRES) =     8476.0
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12340.00 =   49782.27 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12340.00 TO NODE  12341.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    678.19  DOWNSTREAM(FEET) =    630.21
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2827.23   CHANNEL SLOPE =  0.0170
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.60
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.253
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      317.33      0.30     0.999     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7525.45
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.51
 AVERAGE FLOW DEPTH(FEET) =  10.58   TRAVEL TIME(MIN.) =   4.09
 Tc(MIN.) =   59.62
 SUBAREA AREA(ACRES) =   317.33       SUBAREA RUNOFF(CFS) =  272.22
 EFFECTIVE AREA(ACRES) =   7534.41     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     8793.3          PEAK FLOW RATE(CFS) =    7389.34
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.49

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.49   FLOW VELOCITY(FEET/SEC.) =  11.46
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12341.00 =   52609.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12341.00 TO NODE  12342.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    630.21  DOWNSTREAM(FEET) =    601.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2006.47   CHANNEL SLOPE =  0.0142
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.99
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.229
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      124.13      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7441.26
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.76
```

```
  AVERAGE FLOW DEPTH(FEET) =  10.98   TRAVEL TIME(MIN.) =   3.11
  Tc(MIN.) =   62.73
  SUBAREA AREA(ACRES) =   124.13       SUBAREA RUNOFF(CFS) =  103.83
  EFFECTIVE AREA(ACRES) =   7658.54     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     8917.5         PEAK FLOW RATE(CFS) =    7389.34
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.95   FLOW VELOCITY(FEET/SEC.) =  10.74
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12342.00 =   54615.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    601.66  DOWNSTREAM(FEET) =    572.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.49   CHANNEL SLOPE =  0.0156
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.210
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.92      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    7429.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.12
  AVERAGE FLOW DEPTH(FEET) =  10.74   TRAVEL TIME(MIN.) =   2.82
  Tc(MIN.) =   65.55
  SUBAREA AREA(ACRES) =    96.92       SUBAREA RUNOFF(CFS) =   79.39
  EFFECTIVE AREA(ACRES) =   7755.46     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =     9014.4         PEAK FLOW RATE(CFS) =    7389.34
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.71   FLOW VELOCITY(FEET/SEC.) =  11.11
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     9014.4  TC(MIN.) =     65.55
  EFFECTIVE AREA(ACRES) =   7755.46  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.968
  PEAK FLOW RATE(CFS)   =    7389.34

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```


NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	6206.18	41.67	1.543	0.30(0.29)	0.97	4459.8	12300.00
2	6316.16	43.11	1.513	0.30(0.29)	0.97	4682.1	12330.00
3	7075.33	55.07	1.310	0.30(0.29)	0.97	6399.6	12211.00
4	7279.61	59.17	1.258	0.30(0.29)	0.97	6986.1	12201.00
5	7374.25	63.10	1.227	0.30(0.29)	0.97	7454.3	12111.00
6	7389.34	65.55	1.210	0.30(0.29)	0.97	7755.5	12231.00
7	7379.15	68.30	1.191	0.30(0.29)	0.97	8059.8	12101.10
8	7370.30	69.12	1.186	0.30(0.29)	0.97	8140.9	12261.00
9	7028.99	79.53	1.115	0.30(0.29)	0.97	8889.6	12010.00
10	6490.72	87.30	1.061	0.30(0.29)	0.97	9014.4	12000.00

```
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

----------------------------------------------------------------------------
  FILE NAME: S24.DAT
  TIME/DATE OF STUDY: 08:13 07/16/2018
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.549
   2)   10.00;  3.628
   3)   15.00;  2.829
   4)   20.00;  2.353
   5)   25.00;  2.048
   6)   30.00;  1.832
   7)   40.00;  1.577
   8)   50.00;  1.373
   9)   60.00;  1.248
  10)   90.00;  1.043
  11)  120.00;  0.905
  12)  180.00;  0.750
  13)  360.00;  0.547
  14) 1440.00;  0.235
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  12400.00 TO NODE  12401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   981.52
  ELEVATION DATA: UPSTREAM(FEET) =   2579.17  DOWNSTREAM(FEET) =   2249.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.811
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.019
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       -        8.82      0.30     1.000     0   13.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     21.58
  TOTAL AREA(ACRES) =      8.82   PEAK FLOW RATE(CFS) =     21.58

****************************************************************************
  FLOW PROCESS FROM NODE  12401.00 TO NODE  12402.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2249.14  DOWNSTREAM(FEET) =   2103.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   975.11   CHANNEL SLOPE =  0.1490
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.86
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.736
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.29      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      72.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.52
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   15.97
  SUBAREA AREA(ACRES) =    46.29       SUBAREA RUNOFF(CFS) =  101.51
  EFFECTIVE AREA(ACRES) =     55.11     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       55.1          PEAK FLOW RATE(CFS) =     120.85
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.11   FLOW VELOCITY(FEET/SEC.) =   8.92
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12402.00 =    1956.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12402.00 TO NODE  12403.00 IS CODE =  56
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2103.89  DOWNSTREAM(FEET) =   1771.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1880.50   CHANNEL SLOPE =  0.1768
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.456
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.97      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     174.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.64
  AVERAGE FLOW DEPTH(FEET) =   1.30   TRAVEL TIME(MIN.) =   2.95
  Tc(MIN.) =   18.92
  SUBAREA AREA(ACRES) =    54.97       SUBAREA RUNOFF(CFS) =  106.67
  EFFECTIVE AREA(ACRES) =    110.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      110.1         PEAK FLOW RATE(CFS) =     213.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =  11.38
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12403.00 =    3837.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12403.00 TO NODE  12404.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1771.34  DOWNSTREAM(FEET) =   1462.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2888.53   CHANNEL SLOPE =  0.1070
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.14
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.145
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     316.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.73
  AVERAGE FLOW DEPTH(FEET) =   2.08   TRAVEL TIME(MIN.) =   4.49
  Tc(MIN.) =   23.40
  SUBAREA AREA(ACRES) =   123.02       SUBAREA RUNOFF(CFS) =  204.32
  EFFECTIVE AREA(ACRES) =    233.10     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      233.1         PEAK FLOW RATE(CFS) =     387.15
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.32   FLOW VELOCITY(FEET/SEC.) =  11.38
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12404.00 =    6725.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12404.00 TO NODE  12405.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1462.30  DOWNSTREAM(FEET) =   1308.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1925.25   CHANNEL SLOPE =  0.0800
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.996
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      241.71      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     571.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.46
  AVERAGE FLOW DEPTH(FEET) =   3.09   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   26.20
  SUBAREA AREA(ACRES) =   241.71       SUBAREA RUNOFF(CFS) =  368.96
  EFFECTIVE AREA(ACRES) =    474.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      474.8         PEAK FLOW RATE(CFS) =     724.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.48   FLOW VELOCITY(FEET/SEC.) =  12.26
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12405.00 =    8650.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12405.00 TO NODE  12406.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1308.28  DOWNSTREAM(FEET) =   1154.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1923.41   CHANNEL SLOPE =  0.0802
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.889
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      238.96      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     895.73
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.00
  AVERAGE FLOW DEPTH(FEET) =   3.88   TRAVEL TIME(MIN.) =   2.47
  Tc(MIN.) =   28.67
  SUBAREA AREA(ACRES) =   238.96       SUBAREA RUNOFF(CFS) =  341.85
  EFFECTIVE AREA(ACRES) =    713.77     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      713.8         PEAK FLOW RATE(CFS) =    1021.09
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.15   FLOW VELOCITY(FEET/SEC.) =  13.46
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12406.00 =   10574.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1154.02  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1607.69   CHANNEL SLOPE =  0.0503
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.806
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1060.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.45
  AVERAGE FLOW DEPTH(FEET) =   4.75   TRAVEL TIME(MIN.) =   2.34
  Tc(MIN.) =   31.01
  SUBAREA AREA(ACRES) =    58.02       SUBAREA RUNOFF(CFS) =   78.66
  EFFECTIVE AREA(ACRES) =    771.79     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      771.8         PEAK FLOW RATE(CFS) =    1046.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.72   FLOW VELOCITY(FEET/SEC.) =  11.41
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12406.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.01
  RAINFALL INTENSITY(INCH/HR) =   1.81
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     771.79
  TOTAL STREAM AREA(ACRES) =     771.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    1046.31

****************************************************************************
  FLOW PROCESS FROM NODE  12410.00 TO NODE  12411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   966.15
  ELEVATION DATA: UPSTREAM(FEET) =   2215.42  DOWNSTREAM(FEET) =   1909.05

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.886
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.007
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        8.99      0.30     1.000     0   13.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     21.90
  TOTAL AREA(ACRES) =      8.99   PEAK FLOW RATE(CFS) =     21.90

****************************************************************************
  FLOW PROCESS FROM NODE  12411.00 TO NODE  12412.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1909.05  DOWNSTREAM(FEET) =   1794.38
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.59   CHANNEL SLOPE =  0.1215
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.66
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.678
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.56      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.83
  AVERAGE FLOW DEPTH(FEET) =   0.64   TRAVEL TIME(MIN.) =   2.70
  Tc(MIN.) =   16.58
  SUBAREA AREA(ACRES) =    18.56       SUBAREA RUNOFF(CFS) =   39.73
  EFFECTIVE AREA(ACRES) =     27.55     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       27.5         PEAK FLOW RATE(CFS) =      58.97
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   6.58
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12412.00 =    1909.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12412.00 TO NODE  12413.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1794.38  DOWNSTREAM(FEET) =   1649.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.82   CHANNEL SLOPE =  0.1560
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.84
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.488
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.75
  AVERAGE FLOW DEPTH(FEET) =   0.83   TRAVEL TIME(MIN.) =   1.99
  Tc(MIN.) =   18.58
  SUBAREA AREA(ACRES) =    16.09       SUBAREA RUNOFF(CFS) =   31.69
  EFFECTIVE AREA(ACRES) =     43.64     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       43.6         PEAK FLOW RATE(CFS) =      85.96
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOW VELOCITY(FEET/SEC.) =   8.12
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12413.00 =    2836.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12413.00 TO NODE  12414.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1649.76  DOWNSTREAM(FEET) =   1365.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1906.16   CHANNEL SLOPE =  0.1490
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.30
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.238
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       75.14      0.30     1.000     -
```



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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     151.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.59
  AVERAGE FLOW DEPTH(FEET) =   1.26   TRAVEL TIME(MIN.) =   3.31
  Tc(MIN.) =   21.89
  SUBAREA AREA(ACRES) =    75.14       SUBAREA RUNOFF(CFS) =  131.05
  EFFECTIVE AREA(ACRES) =    118.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      118.8          PEAK FLOW RATE(CFS) =     207.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.50   FLOW VELOCITY(FEET/SEC.) =  10.62
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12414.00 =    4742.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1365.78  DOWNSTREAM(FEET) =   1073.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3038.90   CHANNEL SLOPE =  0.0963
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.972
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     321.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.41
  AVERAGE FLOW DEPTH(FEET) =   2.16   TRAVEL TIME(MIN.) =   4.86
  Tc(MIN.) =   26.75
  SUBAREA AREA(ACRES) =   151.43       SUBAREA RUNOFF(CFS) =  227.92
  EFFECTIVE AREA(ACRES) =    270.21     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      270.2          PEAK FLOW RATE(CFS) =     406.70
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.45   FLOW VELOCITY(FEET/SEC.) =  11.13
  LONGEST FLOWPATH FROM NODE  12410.00 TO NODE  12420.00 =    7781.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12414.00 TO NODE  12420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   26.75
 RAINFALL INTENSITY(INCH/HR) =   1.97
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =     270.21
 TOTAL STREAM AREA(ACRES) =     270.21
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     406.70

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1046.31   31.01    1.806  0.30( 0.30) 1.00     771.8   12400.00
     2      406.70   26.75    1.972  0.30( 0.30) 1.00     270.2   12410.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1408.87   26.75    1.972  0.30( 0.30) 1.00     936.1   12410.00
     2     1412.63   31.01    1.806  0.30( 0.30) 1.00    1042.0   12400.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    1412.63    Tc(MIN.) =    31.01
 EFFECTIVE AREA(ACRES) =    1042.00   AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
 TOTAL AREA(ACRES) =     1042.0
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12420.00 =   12182.01 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12420.00 TO NODE  12421.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1073.11  DOWNSTREAM(FEET) =   1005.32
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2235.12   CHANNEL SLOPE =  0.0303
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.47
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.716
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      218.57      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1551.91
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.51
 AVERAGE FLOW DEPTH(FEET) =   6.45   TRAVEL TIME(MIN.) =   3.55
 Tc(MIN.) =   34.55
 SUBAREA AREA(ACRES) =   218.57       SUBAREA RUNOFF(CFS) =  278.53
 EFFECTIVE AREA(ACRES) =   1260.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
```



```
 TOTAL AREA(ACRES) =     1260.6         PEAK FLOW RATE(CFS) =    1606.38
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.56

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.56   FLOW VELOCITY(FEET/SEC.) =  10.60
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12421.00 =   14417.13 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  12421.00 TO NODE  12422.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1005.32  DOWNSTREAM(FEET) =    879.13
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2800.31   CHANNEL SLOPE =  0.0451
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.23
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.621
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      241.55      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1750.00
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.55
 AVERAGE FLOW DEPTH(FEET) =   6.22   TRAVEL TIME(MIN.) =   3.72
 Tc(MIN.) =   38.27
 SUBAREA AREA(ACRES) =   241.55       SUBAREA RUNOFF(CFS) =  287.20
 EFFECTIVE AREA(ACRES) =   1502.12     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =     1502.1         PEAK FLOW RATE(CFS) =    1786.03
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.28

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.28   FLOW VELOCITY(FEET/SEC.) =  12.62
 LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12422.00 =   17217.44 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1796.34   34.02    1.730  0.30( 0.30) 1.00    1396.2   12410.00
     2     1786.03   38.27    1.621  0.30( 0.30) 1.00    1502.1   12400.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1796.34  Tc(MIN.) =   34.02
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1396.17

****************************************************************************
 FLOW PROCESS FROM NODE  12422.00 TO NODE  12423.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    879.13  DOWNSTREAM(FEET) =    815.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1918.90   CHANNEL SLOPE =  0.0333
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.658
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      151.63      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1889.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.44
  AVERAGE FLOW DEPTH(FEET) =   6.92   TRAVEL TIME(MIN.) =   2.79
  Tc(MIN.) =   36.81
  SUBAREA AREA(ACRES) =   151.63       SUBAREA RUNOFF(CFS) =  185.36
  EFFECTIVE AREA(ACRES) =   1547.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1653.8         PEAK FLOW RATE(CFS) =    1892.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.92   FLOW VELOCITY(FEET/SEC.) =  11.46
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12423.00 =   19136.34 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1892.16   36.81    1.658  0.30( 0.30) 1.00    1547.8   12410.00
      2     1868.15   41.07    1.555  0.30( 0.30) 1.00    1653.8   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1892.16  Tc(MIN.) =   36.81
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1547.80

******************************************************************************
  FLOW PROCESS FROM NODE  12423.00 TO NODE  12424.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    815.17  DOWNSTREAM(FEET) =    696.54
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2870.82   CHANNEL SLOPE =  0.0413
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.564
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      122.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1961.79
```



```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.53
  AVERAGE FLOW DEPTH(FEET) =   6.70   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   40.63
  SUBAREA AREA(ACRES) =   122.40       SUBAREA RUNOFF(CFS) =  139.26
  EFFECTIVE AREA(ACRES) =   1670.20     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1776.2         PEAK FLOW RATE(CFS) =    1900.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.60   FLOW VELOCITY(FEET/SEC.) =  12.42
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12424.00 =   22007.16 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1900.23   40.63    1.564  0.30( 0.30) 1.00    1670.2   12410.00
      2     1881.35   44.91    1.477  0.30( 0.30) 1.00    1776.2   12400.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1900.23  Tc(MIN.) =   40.63
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00  EFFECTIVE AREA(ACRES) =    1670.20

******************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    696.54  DOWNSTREAM(FEET) =    572.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3680.45   CHANNEL SLOPE =  0.0338
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.456
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.54      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1950.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.59
  AVERAGE FLOW DEPTH(FEET) =   7.01   TRAVEL TIME(MIN.) =   5.29
  Tc(MIN.) =   45.93
  SUBAREA AREA(ACRES) =    96.54       SUBAREA RUNOFF(CFS) =  100.46
  EFFECTIVE AREA(ACRES) =   1766.74     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =     1872.7         PEAK FLOW RATE(CFS) =    1900.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.92   FLOW VELOCITY(FEET/SEC.) =  11.53
```

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1900.23	45.93	1.456	0.30(0.30)	1.00	1766.7	12410.00
2	1881.35	50.22	1.370	0.30(0.30)	1.00	1872.7	12400.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1900.23 Tc(MIN.) = 45.93
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1766.74

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 1872.7 TC(MIN.) = 45.93
EFFECTIVE AREA(ACRES) = 1766.74 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS) = 1900.23

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1900.23	45.93	1.456	0.30(0.30)	1.00	1766.7	12410.00
2	1881.35	50.22	1.370	0.30(0.30)	1.00	1872.7	12400.00

==========

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S25.DAT
  TIME/DATE OF STUDY: 08:13 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.144
   2)   10.00;  3.922
   3)   15.00;  3.019
   4)   20.00;  2.473
   5)   25.00;  2.135
   6)   30.00;  1.906
   7)   40.00;  1.649
   8)   50.00;  1.422
   9)   60.00;  1.325
  10)   90.00;  1.125
  11)  120.00;  0.989
  12)  180.00;  0.832
  13)  360.00;  0.622
  14) 1440.00;  0.274
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12500.00 TO NODE  12501.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   927.04
  ELEVATION DATA: UPSTREAM(FEET) =   1638.22  DOWNSTREAM(FEET) =   1356.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.770
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.241
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        8.89      0.30     1.000     0   13.77
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     23.53
  TOTAL AREA(ACRES) =      8.89   PEAK FLOW RATE(CFS) =     23.53

**************************************************************************
  FLOW PROCESS FROM NODE  12501.00 TO NODE  12502.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1356.00  DOWNSTREAM(FEET) =   1203.37
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1004.73   CHANNEL SLOPE =  0.1519
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.883
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       24.30      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.78
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   2.47
  Tc(MIN.) =   16.24
  SUBAREA AREA(ACRES) =    24.30       SUBAREA RUNOFF(CFS) =   56.50
  EFFECTIVE AREA(ACRES) =     33.19     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.2          PEAK FLOW RATE(CFS) =      77.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.85   FLOW VELOCITY(FEET/SEC.) =   7.76
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12502.00 =    1931.77 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  12502.00 TO NODE  12503.00 IS CODE =  56
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1203.37  DOWNSTREAM(FEET) =    987.23
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1884.62   CHANNEL SLOPE =  0.1147
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.506
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       90.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     167.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.09
  AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   3.46
  Tc(MIN.) =   19.70
  SUBAREA AREA(ACRES) =    90.42       SUBAREA RUNOFF(CFS) =  179.53
  EFFECTIVE AREA(ACRES) =    123.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      123.6         PEAK FLOW RATE(CFS) =     245.43
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =  10.21
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12503.00 =    3816.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12503.00 TO NODE  12504.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    987.23  DOWNSTREAM(FEET) =    870.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1478.57   CHANNEL SLOPE =  0.0792
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.322
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       84.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     321.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.71
  AVERAGE FLOW DEPTH(FEET) =   2.28   TRAVEL TIME(MIN.) =   2.54
  Tc(MIN.) =   22.24
  SUBAREA AREA(ACRES) =    84.07       SUBAREA RUNOFF(CFS) =  152.98
  EFFECTIVE AREA(ACRES) =    207.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      207.7         PEAK FLOW RATE(CFS) =     377.90
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.48   FLOW VELOCITY(FEET/SEC.) =  10.16
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12504.00 =    5294.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12504.00 TO NODE  12505.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.07  DOWNSTREAM(FEET) =    729.02
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1915.52   CHANNEL SLOPE =  0.0736
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.120
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       79.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     443.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.36
  AVERAGE FLOW DEPTH(FEET) =   2.76   TRAVEL TIME(MIN.) =   3.08
  Tc(MIN.) =   25.32
  SUBAREA AREA(ACRES) =    79.84       SUBAREA RUNOFF(CFS) =  130.79
  EFFECTIVE AREA(ACRES) =    287.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      287.5         PEAK FLOW RATE(CFS) =     471.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.85

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.85   FLOW VELOCITY(FEET/SEC.) =  10.53
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12505.00 =    7210.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    729.02  DOWNSTREAM(FEET) =    549.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2961.35   CHANNEL SLOPE =  0.0605
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.901
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       78.77      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     527.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.15
  AVERAGE FLOW DEPTH(FEET) =   3.18   TRAVEL TIME(MIN.) =   4.86
  Tc(MIN.) =   30.18
  SUBAREA AREA(ACRES) =    78.77       SUBAREA RUNOFF(CFS) =  113.50
  EFFECTIVE AREA(ACRES) =    366.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      366.3          PEAK FLOW RATE(CFS) =     527.80
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.18   FLOW VELOCITY(FEET/SEC.) =  10.15
  LONGEST FLOWPATH FROM NODE  12500.00 TO NODE  12520.00 =   10171.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12505.00 TO NODE  12520.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S23.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     6206.18   41.67  0.30( 0.29) 0.97    4459.8   12300.00
      2     6316.16   43.11  0.30( 0.29) 0.97    4682.1   12330.00
      3     7075.33   55.07  0.30( 0.29) 0.97    6399.6   12211.00
      4     7279.61   59.17  0.30( 0.29) 0.97    6986.1   12201.00
      5     7374.25   63.10  0.30( 0.29) 0.97    7454.3   12111.00
      6     7389.34   65.55  0.30( 0.29) 0.97    7755.5   12231.00
      7     7379.15   68.30  0.30( 0.29) 0.97    8059.8   12101.10
      8     7370.30   69.12  0.30( 0.29) 0.97    8140.9   12261.00
      9     7028.99   79.53  0.30( 0.29) 0.97    8889.6   12010.00
     10     6490.72   87.30  0.30( 0.29) 0.97    9014.4   12000.00
    TOTAL AREA(ACRES) =     9014.4

****************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S24.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1900.23   45.93  0.30( 0.30) 1.00    1766.7   12410.00
      2     1881.35   50.22  0.30( 0.30) 1.00    1872.7   12400.00
    TOTAL AREA(ACRES) =     1872.7
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  12424.00 TO NODE  12425.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1900.23   45.93  0.30( 0.30) 1.00    1766.7   12410.00
      2     1881.35   50.22  0.30( 0.30) 1.00    1872.7   12400.00
    TOTAL AREA(ACRES) =     1872.7

****************************************************************************
  FLOW PROCESS FROM NODE  12342.00 TO NODE  12425.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1900.23   45.93    1.515  0.30( 0.30) 1.00    1766.7   12410.00
      2     1881.35   50.22    1.420  0.30( 0.30) 1.00    1872.7   12400.00
  LONGEST FLOWPATH FROM NODE  12400.00 TO NODE  12425.00 =   25687.61 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     6206.18   41.67    1.611  0.30( 0.29) 0.97    4459.8   12300.00
      2     6316.16   43.11    1.578  0.30( 0.29) 0.97    4682.1   12330.00
      3     7075.33   55.07    1.373  0.30( 0.29) 0.97    6399.6   12211.00
      4     7279.61   59.17    1.333  0.30( 0.29) 0.97    6986.1   12201.00
      5     7374.25   63.10    1.305  0.30( 0.29) 0.97    7454.3   12111.00
      6     7389.34   65.55    1.288  0.30( 0.29) 0.97    7755.5   12231.00
      7     7379.15   68.30    1.270  0.30( 0.29) 0.97    8059.8   12101.10
      8     7370.30   69.12    1.264  0.30( 0.29) 0.97    8140.9   12261.00
      9     7028.99   79.53    1.195  0.30( 0.29) 0.97    8889.6   12010.00
     10     6490.72   87.30    1.143  0.30( 0.29) 0.97    9014.4   12000.00
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12425.00 =   56500.46 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     8067.39   41.67    1.611  0.30( 0.29) 0.98    6063.0   12300.00
      2     8193.72   43.11    1.578  0.30( 0.29) 0.98    6340.7   12330.00
      3     8394.91   45.93    1.515  0.30( 0.29) 0.98    6852.7   12410.00
      4     8648.43   50.22    1.420  0.30( 0.29) 0.98    7574.9   12400.00
      5     8877.69   55.07    1.373  0.30( 0.29) 0.98    8272.3   12211.00
      6     9015.24   59.17    1.333  0.30( 0.29) 0.98    8858.8   12201.00
      7     9061.59   63.10    1.305  0.30( 0.29) 0.97    9327.0   12111.00
      8     9049.24   65.55    1.288  0.30( 0.29) 0.97    9628.2   12231.00
      9     9008.17   68.30    1.270  0.30( 0.29) 0.97    9932.5   12101.10
     10     8990.16   69.12    1.264  0.30( 0.29) 0.97   10013.6   12261.00
     11     8531.90   79.53    1.195  0.30( 0.29) 0.98   10762.3   12010.00
     12     7906.51   87.30    1.143  0.30( 0.29) 0.98   10887.1   12000.00
    TOTAL AREA(ACRES) =    10887.1
```

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 9061.59 Tc(MIN.) = 63.105
EFFECTIVE AREA(ACRES) = 9327.03 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 10887.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

****
FLOW PROCESS FROM NODE 12425.00 TO NODE 12520.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 572.29 DOWNSTREAM(FEET) = 549.92
CHANNEL LENGTH THRU SUBAREA(FEET) = 1724.25 CHANNEL SLOPE = 0.0130
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.50
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.287
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.96	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9113.97
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.66
AVERAGE FLOW DEPTH(FEET) = 10.49 TRAVEL TIME(MIN.) = 2.70
Tc(MIN.) = 65.80
SUBAREA AREA(ACRES) = 117.96 SUBAREA RUNOFF(CFS) = 104.74
EFFECTIVE AREA(ACRES) = 9444.99 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 11005.0 PEAK FLOW RATE(CFS) = 9061.59
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.46 FLOW VELOCITY(FEET/SEC.) = 10.64
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8067.39	44.46	1.548	0.30(0.29)	0.98	6180.9	12300.00
2	8193.72	45.89	1.516	0.30(0.29)	0.98	6458.7	12330.00
3	8394.91	48.68	1.452	0.30(0.29)	0.98	6970.7	12410.00
4	8648.43	52.95	1.394	0.30(0.29)	0.98	7692.9	12400.00
5	8877.69	57.78	1.347	0.30(0.29)	0.98	8390.3	12211.00
6	9015.24	61.87	1.313	0.30(0.29)	0.98	8976.8	12201.00
7	9061.59	65.80	1.287	0.30(0.29)	0.97	9445.0	12111.00
8	9049.24	68.25	1.270	0.30(0.29)	0.97	9746.1	12231.00
9	9008.17	71.00	1.252	0.30(0.29)	0.97	10050.5	12101.10
10	8990.16	71.82	1.246	0.30(0.29)	0.97	10131.5	12261.00
11	8655.27	82.28	1.176	0.30(0.29)	0.98	10880.3	12010.00
12	8238.08	90.10	1.124	0.30(0.29)	0.98	11005.0	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 9061.59 Tc(MIN.) = 65.80
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 9444.99

****
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8067.39	44.46	1.548	0.30(0.29)	0.98	6180.9	12300.00
2	8193.72	45.89	1.516	0.30(0.29)	0.98	6458.7	12330.00
3	8394.91	48.68	1.452	0.30(0.29)	0.98	6970.7	12410.00
4	8648.43	52.95	1.394	0.30(0.29)	0.98	7692.9	12400.00
5	8877.69	57.78	1.347	0.30(0.29)	0.98	8390.3	12211.00
6	9015.24	61.87	1.313	0.30(0.29)	0.98	8976.8	12201.00
7	9061.59	65.80	1.287	0.30(0.29)	0.97	9445.0	12111.00
8	9049.24	68.25	1.270	0.30(0.29)	0.97	9746.1	12231.00
9	9008.17	71.00	1.252	0.30(0.29)	0.97	10050.5	12101.10
10	8990.16	71.82	1.246	0.30(0.29)	0.97	10131.5	12261.00
11	8655.27	82.28	1.176	0.30(0.29)	0.98	10880.3	12010.00
12	8238.08	90.10	1.124	0.30(0.29)	0.98	11005.0	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	527.80	30.18	1.901	0.30(0.30)	1.00	366.3	12500.00

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	30.18	1.901	0.30(0.29)	0.98	4562.3	12500.00
2	8478.81	44.46	1.548	0.30(0.29)	0.98	6547.2	12300.00
3	8594.46	45.89	1.516	0.30(0.29)	0.98	6825.0	12330.00
4	8774.76	48.68	1.452	0.30(0.29)	0.98	7337.0	12410.00
5	9008.99	52.95	1.394	0.30(0.29)	0.98	8059.2	12400.00
6	9222.81	57.78	1.347	0.30(0.29)	0.98	8756.5	12211.00
7	9349.15	61.87	1.313	0.30(0.29)	0.98	9343.1	12201.00
8	9386.85	65.80	1.287	0.30(0.29)	0.98	9811.3	12111.00
9	9369.11	68.25	1.270	0.30(0.29)	0.98	10112.4	12231.00
10	9321.96	71.00	1.252	0.30(0.29)	0.97	10416.8	12101.10
11	9302.16	71.82	1.246	0.30(0.29)	0.97	10497.8	12261.00
12	8944.23	82.28	1.176	0.30(0.29)	0.98	11246.5	12010.00
13	8509.86	90.10	1.124	0.30(0.29)	0.98	11371.3	12000.00

TOTAL AREA(ACRES) = 11371.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 9386.85 Tc(MIN.) = 65.801
EFFECTIVE AREA(ACRES) = 9811.28 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11371.3
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

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  FLOW PROCESS FROM NODE  12520.00 TO NODE  12521.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    549.92  DOWNSTREAM(FEET) =    525.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1934.41   CHANNEL SLOPE =  0.0127
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.266
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       85.91      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9424.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.67
  AVERAGE FLOW DEPTH(FEET) =  10.75   TRAVEL TIME(MIN.) =   3.02
  Tc(MIN.) =   68.82
  SUBAREA AREA(ACRES) =    85.91       SUBAREA RUNOFF(CFS) =   74.72
  EFFECTIVE AREA(ACRES) =   9897.19     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    11457.2         PEAK FLOW RATE(CFS) =    9386.85
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.72   FLOW VELOCITY(FEET/SEC.) =  10.65
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12521.00 =   60159.12 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7546.62   33.39    1.819  0.30( 0.29) 0.98    4648.3   12500.00
      2     8478.81   47.56    1.477  0.30( 0.29) 0.98    6633.1   12300.00
      3     8594.46   48.98    1.445  0.30( 0.29) 0.98    6910.9   12330.00
      4     8774.76   51.76    1.405  0.30( 0.29) 0.98    7422.9   12410.00
      5     9008.99   56.00    1.364  0.30( 0.29) 0.98    8145.1   12400.00
      6     9222.81   60.82    1.320  0.30( 0.29) 0.98    8842.5   12211.00
      7     9349.15   64.90    1.293  0.30( 0.29) 0.98    9429.0   12201.00
      8     9386.85   68.82    1.266  0.30( 0.29) 0.98    9897.2   12111.00
      9     9369.11   71.27    1.250  0.30( 0.29) 0.98   10198.3   12231.00
     10     9321.96   74.03    1.232  0.30( 0.29) 0.97   10502.7   12101.10
     11     9302.16   74.85    1.226  0.30( 0.29) 0.97   10583.7   12261.00
     12     8944.23   85.34    1.156  0.30( 0.29) 0.98   11332.5   12010.00
     13     8509.86   93.20    1.110  0.30( 0.29) 0.98   11457.2   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    9386.85  Tc(MIN.) =   68.82
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =    9897.19

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  FLOW PROCESS FROM NODE  12521.00 TO NODE  12522.00 IS CODE =  56
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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    525.43  DOWNSTREAM(FEET) =    490.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3335.01   CHANNEL SLOPE =  0.0104
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.229
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      539.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9612.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.98
  AVERAGE FLOW DEPTH(FEET) =  11.43   TRAVEL TIME(MIN.) =   5.57
  Tc(MIN.) =   74.39
  SUBAREA AREA(ACRES) =   539.82       SUBAREA RUNOFF(CFS) =  451.44
  EFFECTIVE AREA(ACRES) =  10437.01     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =    11997.0         PEAK FLOW RATE(CFS) =    9386.85
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.29   FLOW VELOCITY(FEET/SEC.) =   9.91
  LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12522.00 =   63494.13 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     7546.62   39.28    1.668  0.30( 0.30) 0.98    5188.1   12500.00
      2     8478.81   53.28    1.390  0.30( 0.30) 0.98    7172.9   12300.00
      3     8594.46   54.68    1.377  0.30( 0.29) 0.98    7450.7   12330.00
      4     8774.76   57.42    1.350  0.30( 0.29) 0.98    7962.7   12410.00
      5     9008.99   61.63    1.314  0.30( 0.29) 0.98    8684.9   12400.00
      6     9222.81   66.41    1.282  0.30( 0.29) 0.98    9382.3   12211.00
      7     9349.15   70.47    1.255  0.30( 0.29) 0.98    9968.8   12201.00
      8     9386.85   74.39    1.229  0.30( 0.29) 0.98   10437.0   12111.00
      9     9369.11   76.84    1.213  0.30( 0.29) 0.98   10738.1   12231.00
     10     9321.96   79.61    1.194  0.30( 0.29) 0.98   11042.5   12101.10
     11     9302.16   80.43    1.189  0.30( 0.29) 0.98   11123.5   12261.00
     12     8944.23   90.99    1.120  0.30( 0.29) 0.98   11872.3   12010.00
     13     8542.67   98.93    1.084  0.30( 0.29) 0.98   11997.0   12000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    9386.85  Tc(MIN.) =   74.39
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10437.01

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  FLOW PROCESS FROM NODE  12522.00 TO NODE  12523.00 IS CODE =  56
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  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
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 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    490.87  DOWNSTREAM(FEET) =    467.63
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1961.26   CHANNEL SLOPE =  0.0118
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.99
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.208
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      321.58      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9518.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.45
 AVERAGE FLOW DEPTH(FEET) =  10.98   TRAVEL TIME(MIN.) =   3.13
 Tc(MIN.) =   77.52
 SUBAREA AREA(ACRES) =   321.58       SUBAREA RUNOFF(CFS) =  262.88
 EFFECTIVE AREA(ACRES) =  10758.59     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =    12318.6         PEAK FLOW RATE(CFS) =    9386.85
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  10.91

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 10.91   FLOW VELOCITY(FEET/SEC.) =  10.41
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12523.00 =   65455.39 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     7546.62   42.60    1.590  0.30( 0.30) 0.99    5509.7   12500.00
     2     8478.81   56.50    1.359  0.30( 0.30) 0.98    7494.5   12300.00
     3     8594.46   57.88    1.346  0.30( 0.30) 0.98    7772.3   12330.00
     4     8774.76   60.61    1.321  0.30( 0.29) 0.98    8284.3   12410.00
     5     9008.99   64.79    1.293  0.30( 0.29) 0.98    9006.5   12400.00
     6     9222.81   69.56    1.261  0.30( 0.29) 0.98    9703.9   12211.00
     7     9349.15   73.61    1.234  0.30( 0.29) 0.98   10290.4   12201.00
     8     9386.85   77.52    1.208  0.30( 0.29) 0.98   10758.6   12111.00
     9     9369.11   79.97    1.192  0.30( 0.29) 0.98   11059.7   12231.00
    10     9321.96   82.74    1.173  0.30( 0.29) 0.98   11364.1   12101.10
    11     9302.16   83.57    1.168  0.30( 0.29) 0.98   11445.1   12261.00
    12     8944.23   94.16    1.106  0.30( 0.29) 0.98   12193.9   12010.00
    13     8608.51  102.14    1.070  0.30( 0.29) 0.98   12318.6   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    9386.85  Tc(MIN.) =   77.52
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   10758.59

****************************************************************************
 FLOW PROCESS FROM NODE  12523.00 TO NODE  12524.00 IS CODE =  56
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 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
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 ELEVATION DATA: UPSTREAM(FEET) =    467.63  DOWNSTREAM(FEET) =    436.35
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2841.85   CHANNEL SLOPE =  0.0110
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.20
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.177
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      298.62      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    9504.72
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.17
 AVERAGE FLOW DEPTH(FEET) =  11.19   TRAVEL TIME(MIN.) =   4.66
 Tc(MIN.) =   82.18
 SUBAREA AREA(ACRES) =   298.62       SUBAREA RUNOFF(CFS) =  235.74
 EFFECTIVE AREA(ACRES) =  11057.21     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
 TOTAL AREA(ACRES) =    12617.2         PEAK FLOW RATE(CFS) =    9386.85
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =  11.11

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 11.11   FLOW VELOCITY(FEET/SEC.) =  10.14
 LONGEST FLOWPATH FROM NODE  12000.00 TO NODE  12524.00 =   68297.24 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     7546.62   47.54    1.478  0.30( 0.30) 0.99    5808.3   12500.00
     2     8478.81   61.29    1.317  0.30( 0.30) 0.98    7793.1   12300.00
     3     8594.46   62.66    1.308  0.30( 0.30) 0.98    8070.9   12330.00
     4     8774.76   65.36    1.290  0.30( 0.30) 0.98    8582.9   12410.00
     5     9008.99   69.50    1.262  0.30( 0.29) 0.98    9305.1   12400.00
     6     9222.81   74.24    1.230  0.30( 0.29) 0.98   10002.5   12211.00
     7     9349.15   78.27    1.203  0.30( 0.29) 0.98   10589.0   12201.00
     8     9386.85   82.18    1.177  0.30( 0.29) 0.98   11057.2   12111.00
     9     9369.11   84.63    1.161  0.30( 0.29) 0.98   11358.3   12231.00
    10     9321.96   87.41    1.142  0.30( 0.29) 0.98   11662.7   12101.10
    11     9302.16   88.24    1.137  0.30( 0.29) 0.98   11743.7   12261.00
    12     8944.23   98.88    1.085  0.30( 0.29) 0.98   12492.5   12010.00
    13     8608.51  106.92    1.048  0.30( 0.29) 0.98   12617.2   12000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    9386.85  Tc(MIN.) =   82.18
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.98  EFFECTIVE AREA(ACRES) =   11057.21

****************************************************************************
 FLOW PROCESS FROM NODE  12524.00 TO NODE  12525.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    436.35  DOWNSTREAM(FEET) =    415.23
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2812.14   CHANNEL SLOPE =  0.0075
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GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.33
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.142
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	251.20	0.30	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9482.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.85
AVERAGE FLOW DEPTH(FEET) = 12.32 TRAVEL TIME(MIN.) = 5.29
Tc(MIN.) = 87.47
SUBAREA AREA(ACRES) = 251.20 SUBAREA RUNOFF(CFS) = 190.51
EFFECTIVE AREA(ACRES) = 11308.41 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 12868.4 PEAK FLOW RATE(CFS) = 9386.85
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 12.26 FLOW VELOCITY(FEET/SEC.) = 8.83
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12525.00 = 71109.38 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	53.16	1.392	0.30(0.30)	0.99	6059.5	12500.00
2	8478.81	66.73	1.280	0.30(0.30)	0.99	8044.3	12300.00
3	8594.46	68.08	1.271	0.30(0.30)	0.98	8322.1	12330.00
4	8774.76	70.75	1.254	0.30(0.30)	0.98	8834.1	12410.00
5	9008.99	74.85	1.226	0.30(0.29)	0.98	9556.3	12400.00
6	9222.81	79.55	1.195	0.30(0.29)	0.98	10253.7	12211.00
7	9349.15	83.57	1.168	0.30(0.29)	0.98	10840.2	12201.00
8	9386.85	87.47	1.142	0.30(0.29)	0.98	11308.4	12111.00
9	9369.11	89.93	1.125	0.30(0.29)	0.98	11609.5	12231.00
10	9321.96	92.71	1.113	0.30(0.29)	0.98	11913.9	12101.10
11	9302.16	93.55	1.109	0.30(0.29)	0.98	11994.9	12261.00
12	8944.23	104.25	1.060	0.30(0.29)	0.98	12743.7	12010.00
13	8608.51	112.34	1.024	0.30(0.29)	0.98	12868.4	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 9386.85 Tc(MIN.) = 87.47
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 11308.41

****
FLOW PROCESS FROM NODE 12525.00 TO NODE 12526.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 415.23 DOWNSTREAM(FEET) = 380.28
CHANNEL LENGTH THRU SUBAREA(FEET) = 2934.09 CHANNEL SLOPE = 0.0119
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

*ESTIMATED CHANNEL HEIGHT(FEET) = 7.86
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.112
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	247.71	0.30	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9477.82
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.18
AVERAGE FLOW DEPTH(FEET) = 7.85 TRAVEL TIME(MIN.) = 5.32
Tc(MIN.) = 92.80
SUBAREA AREA(ACRES) = 247.71 SUBAREA RUNOFF(CFS) = 181.95
EFFECTIVE AREA(ACRES) = 11556.12 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 13116.2 PEAK FLOW RATE(CFS) = 9386.85
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.81

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.81 FLOW VELOCITY(FEET/SEC.) = 9.16
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12526.00 = 74043.48 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	58.85	1.336	0.30(0.30)	0.99	6307.2	12500.00
2	8478.81	72.22	1.244	0.30(0.30)	0.99	8292.1	12300.00
3	8594.46	73.55	1.235	0.30(0.30)	0.98	8569.8	12330.00
4	8774.76	76.18	1.217	0.30(0.30)	0.98	9081.8	12410.00
5	9008.99	80.24	1.190	0.30(0.29)	0.98	9804.0	12400.00
6	9222.81	84.91	1.159	0.30(0.29)	0.98	10501.4	12211.00
7	9349.15	88.90	1.132	0.30(0.29)	0.98	11087.9	12201.00
8	9386.85	92.80	1.112	0.30(0.29)	0.98	11556.1	12111.00
9	9369.11	95.26	1.101	0.30(0.29)	0.98	11857.2	12231.00
10	9321.96	98.05	1.088	0.30(0.29)	0.98	12161.6	12101.10
11	9302.16	98.89	1.085	0.30(0.29)	0.98	12242.6	12261.00
12	8944.23	109.66	1.036	0.30(0.29)	0.98	12991.4	12010.00
13	8608.51	117.81	0.999	0.30(0.29)	0.98	13116.2	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 9386.85 Tc(MIN.) = 92.80
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 11556.12

****
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 380.28 DOWNSTREAM(FEET) = 347.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 3113.51 CHANNEL SLOPE = 0.0105
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.11
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.085

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	120.94	0.30	0.974	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.974
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   9430.02
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.79
AVERAGE FLOW DEPTH(FEET) =   8.10   TRAVEL TIME(MIN.) =   5.90
Tc(MIN.) =   98.70
SUBAREA AREA(ACRES) =   120.94   SUBAREA RUNOFF(CFS) =   86.35
EFFECTIVE AREA(ACRES) = 11677.06   AREA-AVERAGED Fm(INCH/HR) =   0.29
AREA-AVERAGED Fp(INCH/HR) =   0.30 AREA-AVERAGED Ap =   0.98
TOTAL AREA(ACRES) =   13237.1   PEAK FLOW RATE(CFS) =   9386.85
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00   CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR =   4.000   MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) =   8.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.08   FLOW VELOCITY(FEET/SEC.) =   8.78
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 =   77156.98 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	1.291	0.30(0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	1.203	0.30(0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	1.194	0.30(0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	1.177	0.30(0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	1.150	0.30(0.29)	0.98	9925.0	12400.00
6	9222.81	90.84	1.121	0.30(0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	1.103	0.30(0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	1.085	0.30(0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	1.074	0.30(0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	1.062	0.30(0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	1.058	0.30(0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	1.009	0.30(0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.979	0.30(0.29)	0.98	13237.1	12000.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =   9386.85 Tc(MIN.) =   98.70
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) =   11677.06

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES)   =   13237.1 TC(MIN.) =   98.70
EFFECTIVE AREA(ACRES) = 11677.06 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.979
PEAK FLOW RATE(CFS)   =   9386.85

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	1.291	0.30(0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	1.203	0.30(0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	1.194	0.30(0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	1.177	0.30(0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	1.150	0.30(0.29)	0.98	9925.0	12400.00

6	9222.81	90.84	1.121	0.30(0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	1.103	0.30(0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	1.085	0.30(0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	1.074	0.30(0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	1.062	0.30(0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	1.058	0.30(0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	1.009	0.30(0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.979	0.30(0.29)	0.98	13237.1	12000.00

==========

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S26.DAT
  TIME/DATE OF STUDY: 08:13 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.099
   2)   10.00;  3.899
   3)   15.00;  3.004
   4)   20.00;  2.464
   5)   25.00;  2.128
   6)   30.00;  1.900
   7)   40.00;  1.644
   8)   50.00;  1.418
   9)   60.00;  1.319
  10)   90.00;  1.119
  11)  120.00;  0.983
  12)  180.00;  0.826
  13)  360.00;  0.616
  14) 1200.00;  0.271
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S19.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    25330.83   16.62  0.30( 0.30) 0.99    6202.0   40200.00
      2    29136.17   30.53  0.30( 0.30) 0.99   11484.0   40100.00
      3    31428.09   37.20  0.30( 0.30) 0.99   13874.9   11831.00
      4    32233.26   39.75  0.30( 0.30) 0.99   14828.3   11801.00
      5    35316.21   49.76  0.30( 0.30) 0.99   19123.7   11530.00
      6    37730.98   58.67  0.30( 0.30) 0.99   24107.5   11910.00
      7    39954.48   66.11  0.30( 0.30) 0.99   28713.7   11330.00
      8    41102.23   72.60  0.30( 0.30) 0.99   33144.0   11130.00
      9    41075.25   80.17  0.30( 0.30) 0.99   37134.3   12330.00
     10    41040.71   82.77  0.30( 0.30) 0.99   38551.3   12410.00
     11    40892.30   86.78  0.30( 0.30) 0.99   40477.3   12400.00
     12    40433.39   95.38  0.30( 0.30) 0.99   43844.7   12201.00
     13    40005.67   99.27  0.30( 0.30) 0.99   44930.9   12111.00
     14    39725.68  101.62  0.30( 0.30) 0.99   45571.3   10700.00
     15    39402.63  104.54  0.30( 0.30) 0.99   46300.3   12101.10
     16    38908.56  108.48  0.30( 0.30) 0.99   47151.1   10400.00
     17    37425.68  116.23  0.30( 0.30) 0.99   48463.2   12010.00
     18    36149.29  121.90  0.30( 0.30) 0.99   48779.7   10210.00
     19    35796.61  124.46  0.30( 0.30) 0.99   48888.7   12000.00
     20    32836.05  147.31  0.30( 0.30) 0.99   49511.8   10100.00
   TOTAL AREA(ACRES) =    49511.8

**************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  11929.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    25330.83   16.62  0.30( 0.30) 0.99    6202.0   40200.00
      2    29136.17   30.53  0.30( 0.30) 0.99   11484.0   40100.00
      3    31428.09   37.20  0.30( 0.30) 0.99   13874.9   11831.00
      4    32233.26   39.75  0.30( 0.30) 0.99   14828.3   11801.00
      5    35316.21   49.76  0.30( 0.30) 0.99   19123.7   11530.00
      6    37730.98   58.67  0.30( 0.30) 0.99   24107.5   11910.00
      7    39954.48   66.11  0.30( 0.30) 0.99   28713.7   11330.00
      8    41102.23   72.60  0.30( 0.30) 0.99   33144.0   11130.00
      9    41075.25   80.17  0.30( 0.30) 0.99   37134.3   12330.00
     10    41040.71   82.77  0.30( 0.30) 0.99   38551.3   12410.00
     11    40892.30   86.78  0.30( 0.30) 0.99   40477.3   12400.00
     12    40433.39   95.38  0.30( 0.30) 0.99   43844.7   12201.00
     13    40005.67   99.27  0.30( 0.30) 0.99   44930.9   12111.00
     14    39725.68  101.62  0.30( 0.30) 0.99   45571.3   10700.00
     15    39402.63  104.54  0.30( 0.30) 0.99   46300.3   12101.10
     16    38908.56  108.48  0.30( 0.30) 0.99   47151.1   10400.00
     17    37425.68  116.23  0.30( 0.30) 0.99   48463.2   12010.00
     18    36149.29  121.90  0.30( 0.30) 0.99   48779.7   10210.00
```

```
    19    35796.61  124.46  0.30( 0.30) 0.99   48888.7   12000.00
    20    32836.05  147.31  0.30( 0.30) 0.99   49511.8   10100.00
   TOTAL AREA(ACRES) =     49511.8

****************************************************************************
  FLOW PROCESS FROM NODE  11929.00 TO NODE  12601.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    341.63  DOWNSTREAM(FEET) =    325.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1467.93   CHANNEL SLOPE =  0.0113
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.57
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.227
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.11      0.30     0.992     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.992
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   41108.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  19.74
  AVERAGE FLOW DEPTH(FEET) =   8.57   TRAVEL TIME(MIN.) =   1.24
  Tc(MIN.) =   73.84
  SUBAREA AREA(ACRES) =    14.11       SUBAREA RUNOFF(CFS) =   11.80
  EFFECTIVE AREA(ACRES) =  33158.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    49525.9         PEAK FLOW RATE(CFS) =   41102.23
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.57   FLOW VELOCITY(FEET/SEC.) =  19.74
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25330.83   18.07    2.672  0.30( 0.30) 0.99    6216.1   40200.00
      2    29136.17   31.92    1.851  0.30( 0.30) 0.99   11498.1   40100.00
      3    31428.09   38.55    1.681  0.30( 0.30) 0.99   13889.0   11831.00
      4    32233.26   41.09    1.619  0.30( 0.30) 0.99   14842.4   11801.00
      5    35316.21   51.07    1.407  0.30( 0.30) 0.99   19137.8   11530.00
      6    37730.98   59.94    1.320  0.30( 0.30) 0.99   24121.6   11910.00
      7    39954.48   67.36    1.270  0.30( 0.30) 0.99   28727.8   11330.00
      8    41102.23   73.84    1.227  0.30( 0.30) 0.99   33158.1   11130.00
      9    41075.25   81.41    1.176  0.30( 0.30) 0.99   37148.4   12330.00
     10    41040.71   84.01    1.159  0.30( 0.30) 0.99   38565.4   12410.00
     11    40892.30   88.03    1.132  0.30( 0.30) 0.99   40491.4   12400.00
     12    40433.39   96.62    1.089  0.30( 0.30) 0.99   43858.8   12201.00
     13    40005.67  100.52    1.071  0.30( 0.30) 0.99   44945.1   12111.00
     14    39725.68  102.87    1.061  0.30( 0.30) 0.99   45585.4   10700.00
     15    39402.63  105.79    1.047  0.30( 0.30) 0.99   46314.4   12101.10
     16    38908.56  109.74    1.030  0.30( 0.30) 0.99   47165.2   10400.00
```



```
     17    37425.68  117.51    0.994  0.30( 0.30) 0.99   48477.3   12010.00
     18    36149.29  123.19    0.975  0.30( 0.30) 0.99   48793.8   10210.00
     19    35796.61  125.76    0.968  0.30( 0.30) 0.99   48902.8   12000.00
     20    32836.05  148.64    0.908  0.30( 0.30) 0.99   49525.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41102.23  Tc(MIN.) =   73.84
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   33158.14

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610318Y.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      248.72   16.54  0.30( 0.30) 1.00     108.9   31800.00
      2      233.03   19.99  0.30( 0.30) 1.00     119.0   31810.00
    TOTAL AREA(ACRES) =      119.0

****************************************************************************
  FLOW PROCESS FROM NODE  12601.00 TO NODE  12601.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25330.83   18.07    2.672  0.30( 0.30) 0.99    6216.1   40200.00
      2    29136.17   31.92    1.851  0.30( 0.30) 0.99   11498.1   40100.00
      3    31428.09   38.55    1.681  0.30( 0.30) 0.99   13889.0   11831.00
      4    32233.26   41.09    1.619  0.30( 0.30) 0.99   14842.4   11801.00
      5    35316.21   51.07    1.407  0.30( 0.30) 0.99   19137.8   11530.00
      6    37730.98   59.94    1.320  0.30( 0.30) 0.99   24121.6   11910.00
      7    39954.48   67.36    1.270  0.30( 0.30) 0.99   28727.8   11330.00
      8    41102.23   73.84    1.227  0.30( 0.30) 0.99   33158.1   11130.00
      9    41075.25   81.41    1.176  0.30( 0.30) 0.99   37148.4   12330.00
     10    41040.71   84.01    1.159  0.30( 0.30) 0.99   38565.4   12410.00
     11    40892.30   88.03    1.132  0.30( 0.30) 0.99   40491.4   12400.00
     12    40433.39   96.62    1.089  0.30( 0.30) 0.99   43858.8   12201.00
     13    40005.67  100.52    1.071  0.30( 0.30) 0.99   44945.1   12111.00
     14    39725.68  102.87    1.061  0.30( 0.30) 0.99   45585.4   10700.00
     15    39402.63  105.79    1.047  0.30( 0.30) 0.99   46314.4   12101.10
     16    38908.56  109.74    1.030  0.30( 0.30) 0.99   47165.2   10400.00
     17    37425.68  117.51    0.994  0.30( 0.30) 0.99   48477.3   12010.00
     18    36149.29  123.19    0.975  0.30( 0.30) 0.99   48793.8   10210.00
     19    35796.61  125.76    0.968  0.30( 0.30) 0.99   48902.8   12000.00
     20    32836.05  148.64    0.908  0.30( 0.30) 0.99   49525.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12601.00 =   99868.45 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      248.72   16.54    2.838  0.30( 0.30) 1.00     108.9   31800.00
      2      233.03   19.99    2.465  0.30( 0.30) 1.00     119.0   31810.00
```

LONGEST FLOWPATH FROM NODE 31810.00 TO NODE 12601.00 = 4599.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25047.11	16.54	2.838	0.30(0.30)	0.99	5797.3	31800.00
2	25572.57	18.07	2.672	0.30(0.30)	0.99	6329.5	40200.00
3	26090.52	19.99	2.465	0.30(0.30)	0.99	7066.2	31810.00
4	29303.09	31.92	1.851	0.30(0.30)	0.99	11617.1	40100.00
5	31576.74	38.55	1.681	0.30(0.30)	0.99	14008.0	11831.00
6	32375.27	41.09	1.619	0.30(0.30)	0.99	14961.4	11801.00
7	35435.41	51.07	1.407	0.30(0.30)	0.99	19256.8	11530.00
8	37840.72	59.94	1.320	0.30(0.30)	0.99	24240.6	11910.00
9	40058.88	67.36	1.270	0.30(0.30)	0.99	28846.8	11330.00
10	41201.98	73.84	1.227	0.30(0.30)	0.99	33277.2	11130.00
11	41169.56	81.41	1.176	0.30(0.30)	0.99	37267.4	12330.00
12	41133.16	84.01	1.159	0.30(0.30)	0.99	38684.4	12410.00
13	40981.88	88.03	1.132	0.30(0.30)	0.99	40610.5	12400.00
14	40518.31	96.62	1.089	0.30(0.30)	0.99	43977.8	12201.00
15	40088.70	100.52	1.071	0.30(0.30)	0.99	45064.1	12111.00
16	39807.55	102.87	1.061	0.30(0.30)	0.99	45704.4	10700.00
17	39483.08	105.79	1.047	0.30(0.30)	0.99	46433.4	12101.10
18	38987.08	109.74	1.030	0.30(0.30)	0.99	47284.2	10400.00
19	37500.42	117.51	0.994	0.30(0.30)	0.99	48596.3	12010.00
20	36221.91	123.19	0.975	0.30(0.30)	0.99	48912.9	10210.00
21	35868.50	125.76	0.968	0.30(0.30)	0.99	49021.8	12000.00
22	32901.50	148.64	0.908	0.30(0.30)	0.99	49644.9	10100.00

TOTAL AREA(ACRES) = 49644.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 41201.98 Tc(MIN.) = 73.842
EFFECTIVE AREA(ACRES) = 33277.17 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 49644.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

****
FLOW PROCESS FROM NODE 12601.00 TO NODE 12602.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 325.00 DOWNSTREAM(FEET) = 313.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1377.46 CHANNEL SLOPE = 0.0087
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.25
CHANNEL FLOW THRU SUBAREA(CFS) = 41201.98
FLOW VELOCITY(FEET/SEC.) = 18.09 FLOW DEPTH(FEET) = 9.25
TRAVEL TIME(MIN.) = 1.27 Tc(MIN.) = 75.11
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12602.00 = 101245.91 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25047.11	18.04	2.676	0.30(0.30)	0.99	5797.3	31800.00
2	25572.57	19.56	2.511	0.30(0.30)	0.99	6329.5	40200.00
3	26090.52	21.47	2.365	0.30(0.30)	0.99	7066.2	31810.00
4	29303.09	33.34	1.814	0.30(0.30)	0.99	11617.1	40100.00
5	31576.74	39.94	1.646	0.30(0.30)	0.99	14008.0	11831.00
6	32375.27	42.47	1.588	0.30(0.30)	0.99	14961.4	11801.00
7	35435.41	52.40	1.394	0.30(0.30)	0.99	19256.8	11530.00
8	37840.72	61.25	1.311	0.30(0.30)	0.99	24240.6	11910.00
9	40058.88	68.64	1.261	0.30(0.30)	0.99	28846.8	11330.00
10	41201.98	75.11	1.218	0.30(0.30)	0.99	33277.2	11130.00
11	41169.56	82.68	1.168	0.30(0.30)	0.99	37267.4	12330.00
12	41133.16	85.28	1.150	0.30(0.30)	0.99	38684.4	12410.00
13	40981.88	89.30	1.124	0.30(0.30)	0.99	40610.5	12400.00
14	40518.31	97.90	1.083	0.30(0.30)	0.99	43977.8	12201.00
15	40088.70	101.80	1.066	0.30(0.30)	0.99	45064.1	12111.00
16	39807.55	104.16	1.055	0.30(0.30)	0.99	45704.4	10700.00
17	39483.08	107.08	1.042	0.30(0.30)	0.99	46433.4	12101.10
18	38987.08	111.03	1.024	0.30(0.30)	0.99	47284.2	10400.00
19	37500.42	118.82	0.988	0.30(0.30)	0.99	48596.3	12010.00
20	36221.91	124.51	0.971	0.30(0.30)	0.99	48912.9	10210.00
21	35868.50	127.09	0.964	0.30(0.30)	0.99	49021.8	12000.00
22	32901.50	150.01	0.904	0.30(0.30)	0.99	49644.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 41201.98 Tc(MIN.) = 75.11
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33277.17

****
FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 313.00 DOWNSTREAM(FEET) = 310.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 312.40 CHANNEL SLOPE = 0.0096
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.00
CHANNEL FLOW THRU SUBAREA(CFS) = 41201.98
FLOW VELOCITY(FEET/SEC.) = 18.69 FLOW DEPTH(FEET) = 9.00
TRAVEL TIME(MIN.) = 0.28 Tc(MIN.) = 75.39
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25047.11	18.37	2.640	0.30(0.30)	0.99	5797.3	31800.00
2	25572.57	19.89	2.476	0.30(0.30)	0.99	6329.5	40200.00
3	26090.52	21.79	2.343	0.30(0.30)	0.99	7066.2	31810.00
4	29303.09	33.65	1.806	0.30(0.30)	0.99	11617.1	40100.00
5	31576.74	40.24	1.638	0.30(0.30)	0.99	14008.0	11831.00
6	32375.27	42.77	1.581	0.30(0.30)	0.99	14961.4	11801.00
7	35435.41	52.69	1.391	0.30(0.30)	0.99	19256.8	11530.00
8	37840.72	61.53	1.309	0.30(0.30)	0.99	24240.6	11910.00
9	40058.88	68.92	1.260	0.30(0.30)	0.99	28846.8	11330.00
10	41201.98	75.39	1.216	0.30(0.30)	0.99	33277.2	11130.00
11	41169.56	82.96	1.166	0.30(0.30)	0.99	37267.4	12330.00
12	41133.16	85.56	1.149	0.30(0.30)	0.99	38684.4	12410.00
13	40981.88	89.58	1.122	0.30(0.30)	0.99	40610.5	12400.00
14	40518.31	98.18	1.082	0.30(0.30)	0.99	43977.8	12201.00
15	40088.70	102.08	1.064	0.30(0.30)	0.99	45064.1	12111.00

```
    16    39807.55  104.44    1.054  0.30( 0.30) 0.99   45704.4   10700.00
    17    39483.08  107.36    1.040  0.30( 0.30) 0.99   46433.4   12101.10
    18    38987.08  111.32    1.022  0.30( 0.30) 0.99   47284.2   10400.00
    19    37500.42  119.10    0.987  0.30( 0.30) 0.99   48596.3   12010.00
    20    36221.91  124.80    0.970  0.30( 0.30) 0.99   48912.9   10210.00
    21    35868.50  127.38    0.964  0.30( 0.30) 0.99   49021.8   12000.00
    22    32901.50  150.31    0.904  0.30( 0.30) 0.99   49644.9   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41201.98  Tc(MIN.) =   75.39
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   33277.17

****************************************************************************
  FLOW PROCESS FROM NODE  12602.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610317Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      145.26   16.45  0.30( 0.30) 1.00      63.3   31700.00
      2      139.77   19.86  0.30( 0.30) 1.00      71.3   31710.00
    TOTAL AREA(ACRES) =       71.3

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25047.11   18.37    2.640  0.30( 0.30) 0.99    5797.3   31800.00
      2    25572.57   19.89    2.476  0.30( 0.30) 0.99    6329.5   40200.00
      3    26090.52   21.79    2.343  0.30( 0.30) 0.99    7066.2   31810.00
      4    29303.09   33.65    1.806  0.30( 0.30) 0.99   11617.1   40100.00
      5    31576.74   40.24    1.638  0.30( 0.30) 0.99   14008.0   11831.00
      6    32375.27   42.77    1.581  0.30( 0.30) 0.99   14961.4   11801.00
      7    35435.41   52.69    1.391  0.30( 0.30) 0.99   19256.8   11530.00
      8    37840.72   61.53    1.309  0.30( 0.30) 0.99   24240.6   11910.00
      9    40058.88   68.92    1.260  0.30( 0.30) 0.99   28846.8   11330.00
     10    41201.98   75.39    1.216  0.30( 0.30) 0.99   33277.2   11130.00
     11    41169.56   82.96    1.166  0.30( 0.30) 0.99   37267.4   12330.00
     12    41133.16   85.56    1.149  0.30( 0.30) 0.99   38684.4   12410.00
     13    40981.88   89.58    1.122  0.30( 0.30) 0.99   40610.5   12400.00
     14    40518.31   98.18    1.082  0.30( 0.30) 0.99   43977.8   12201.00
     15    40088.70  102.08    1.064  0.30( 0.30) 0.99   45064.1   12111.00
     16    39807.55  104.44    1.054  0.30( 0.30) 0.99   45704.4   10700.00
     17    39483.08  107.36    1.040  0.30( 0.30) 0.99   46433.4   12101.10
     18    38987.08  111.32    1.022  0.30( 0.30) 0.99   47284.2   10400.00
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    19    37500.42  119.10    0.987  0.30( 0.30) 0.99   48596.3   12010.00
    20    36221.91  124.80    0.970  0.30( 0.30) 0.99   48912.9   10210.00
    21    35868.50  127.38    0.964  0.30( 0.30) 0.99   49021.8   12000.00
    22    32901.50  150.31    0.904  0.30( 0.30) 0.99   49644.9   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      145.26   16.45    2.848  0.30( 0.30) 1.00      63.3   31700.00
      2      139.77   19.86    2.479  0.30( 0.30) 1.00      71.3   31710.00
  LONGEST FLOWPATH FROM NODE  31710.00 TO NODE  12603.00 =    3633.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24558.64   16.45    2.848  0.30( 0.30) 0.99    5253.9   31700.00
      2    25189.28   18.37    2.640  0.30( 0.30) 0.99    5865.1   31800.00
      3    25703.43   19.86    2.479  0.30( 0.30) 0.99    6391.8   31710.00
      4    25712.16   19.89    2.476  0.30( 0.30) 0.99    6400.8   40200.00
      5    26221.60   21.79    2.343  0.30( 0.30) 0.99    7137.4   31810.00
      6    29399.72   33.65    1.806  0.30( 0.30) 0.99   11688.4   40100.00
      7    31662.60   40.24    1.638  0.30( 0.30) 0.99   14079.3   11831.00
      8    32457.47   42.77    1.581  0.30( 0.30) 0.99   15032.7   11801.00
      9    35505.42   52.69    1.391  0.30( 0.30) 0.99   19328.1   11530.00
     10    37905.43   61.53    1.309  0.30( 0.30) 0.99   24311.9   11910.00
     11    40120.43   68.92    1.260  0.30( 0.30) 0.99   28918.1   11330.00
     12    41260.77   75.39    1.216  0.30( 0.30) 0.99   33348.4   11130.00
     13    41225.11   82.96    1.166  0.30( 0.30) 0.99   37338.7   12330.00
     14    41187.60   85.56    1.149  0.30( 0.30) 0.99   38755.7   12410.00
     15    41034.60   89.58    1.122  0.30( 0.30) 0.99   40681.7   12400.00
     16    40568.47   98.18    1.082  0.30( 0.30) 0.99   44049.1   12201.00
     17    40137.72  102.08    1.064  0.30( 0.30) 0.99   45135.4   12111.00
     18    39855.89  104.44    1.054  0.30( 0.30) 0.99   45775.7   10700.00
     19    39530.57  107.36    1.040  0.30( 0.30) 0.99   46504.7   12101.10
     20    39033.42  111.32    1.022  0.30( 0.30) 0.99   47355.5   10400.00
     21    37544.50  119.10    0.987  0.30( 0.30) 0.99   48667.6   12010.00
     22    36264.91  124.80    0.970  0.30( 0.30) 0.99   48984.1   10210.00
     23    35911.08  127.38    0.964  0.30( 0.30) 0.99   49093.1   12000.00
     24    32940.23  150.31    0.904  0.30( 0.30) 0.99   49716.2   10100.00
    TOTAL AREA(ACRES) =     49716.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    41260.77  Tc(MIN.) =   75.390
  EFFECTIVE AREA(ACRES) =  33348.44  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49716.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE = 15.1
----------------------------------------------------------------------------
```

```
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610403Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1       365.26   18.67  0.30( 0.29) 0.97      175.0   40300.00
    TOTAL AREA(ACRES) =       175.0

********************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12603.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     24558.64   16.45    2.848  0.30( 0.30) 0.99    5253.9   31700.00
      2     25189.28   18.37    2.640  0.30( 0.30) 0.99    5865.1   31800.00
      3     25703.43   19.86    2.479  0.30( 0.30) 0.99    6391.8   31710.00
      4     25712.16   19.89    2.476  0.30( 0.30) 0.99    6400.8   40200.00
      5     26221.60   21.79    2.343  0.30( 0.30) 0.99    7137.4   31810.00
      6     29399.72   33.65    1.806  0.30( 0.30) 0.99   11688.4   40100.00
      7     31662.60   40.24    1.638  0.30( 0.30) 0.99   14079.3   11831.00
      8     32457.47   42.77    1.581  0.30( 0.30) 0.99   15032.7   11801.00
      9     35505.42   52.69    1.391  0.30( 0.30) 0.99   19328.1   11530.00
     10     37905.43   61.53    1.309  0.30( 0.30) 0.99   24311.9   11910.00
     11     40120.43   68.92    1.260  0.30( 0.30) 0.99   28918.1   11330.00
     12     41260.77   75.39    1.216  0.30( 0.30) 0.99   33348.4   11130.00
     13     41225.11   82.96    1.166  0.30( 0.30) 0.99   37338.7   12330.00
     14     41187.60   85.56    1.149  0.30( 0.30) 0.99   38755.7   12410.00
     15     41034.60   89.58    1.122  0.30( 0.30) 0.99   40681.7   12400.00
     16     40568.47   98.18    1.082  0.30( 0.30) 0.99   44049.1   12201.00
     17     40137.72  102.08    1.064  0.30( 0.30) 0.99   45135.4   12111.00
     18     39855.89  104.44    1.054  0.30( 0.30) 0.99   45775.7   10700.00
     19     39530.57  107.36    1.040  0.30( 0.30) 0.99   46504.7   12101.10
     20     39033.42  111.32    1.022  0.30( 0.30) 0.99   47355.5   10400.00
     21     37544.50  119.10    0.987  0.30( 0.30) 0.99   48667.6   12010.00
     22     36264.91  124.80    0.970  0.30( 0.30) 0.99   48984.1   10210.00
     23     35911.08  127.38    0.964  0.30( 0.30) 0.99   49093.1   12000.00
     24     32940.23  150.31    0.904  0.30( 0.30) 0.99   49716.2   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1       365.26   18.67    2.608  0.30( 0.29) 0.97     175.0   40300.00
  LONGEST FLOWPATH FROM NODE  40300.00 TO NODE  12603.00 =    5256.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     24913.73   16.45    2.848  0.30( 0.30) 0.99    5408.1   31700.00
      2     25553.69   18.37    2.640  0.30( 0.30) 0.99    6037.3   31800.00
      3     25657.87   18.67    2.608  0.30( 0.30) 0.99    6146.0   40300.00
      4     26048.35   19.86    2.479  0.30( 0.30) 0.99    6566.8   31710.00
      5     26056.65   19.89    2.476  0.30( 0.30) 0.99    6575.8   40200.00
```



```
      6     26545.21   21.79    2.343  0.30( 0.30) 0.99    7312.5   31810.00
      7     29638.72   33.65    1.806  0.30( 0.30) 0.99   11863.4   40100.00
      8     31875.13   40.24    1.638  0.30( 0.30) 0.99   14254.3   11831.00
      9     32661.01   42.77    1.581  0.30( 0.30) 0.99   15207.7   11801.00
     10     35679.02   52.69    1.391  0.30( 0.30) 0.99   19503.1   11530.00
     11     38066.02   61.53    1.309  0.30( 0.30) 0.99   24486.9   11910.00
     12     40273.26   68.92    1.260  0.30( 0.30) 0.99   29093.1   11330.00
     13     41406.80   75.39    1.216  0.30( 0.30) 0.99   33523.5   11130.00
     14     41363.20   82.96    1.166  0.30( 0.30) 0.99   37513.7   12330.00
     15     41322.96   85.56    1.149  0.30( 0.30) 0.99   38930.7   12410.00
     16     41165.73   89.58    1.122  0.30( 0.30) 0.99   40856.8   12400.00
     17     40693.32   98.18    1.082  0.30( 0.30) 0.99   44224.1   12201.00
     18     40259.79  102.08    1.064  0.30( 0.30) 0.99   45310.4   12111.00
     19     39976.27  104.44    1.054  0.30( 0.30) 0.99   45950.7   10700.00
     20     39648.86  107.36    1.040  0.30( 0.30) 0.99   46679.8   12101.10
     21     39148.89  111.32    1.022  0.30( 0.30) 0.99   47530.5   10400.00
     22     37654.40  119.10    0.987  0.30( 0.30) 0.99   48842.6   12010.00
     23     36372.20  124.80    0.970  0.30( 0.30) 0.99   49159.2   10210.00
     24     36017.30  127.38    0.964  0.30( 0.30) 0.99   49268.1   12000.00
     25     33037.00  150.31    0.904  0.30( 0.30) 0.99   49891.2   10100.00
   TOTAL AREA(ACRES) =     49891.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    41406.80  Tc(MIN.) =   75.390
  EFFECTIVE AREA(ACRES) =  33523.49  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    49891.2
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12603.00 =  101558.30 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  12603.00 TO NODE  12604.00 IS CODE =  56
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    310.00  DOWNSTREAM(FEET) =    307.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.69   CHANNEL SLOPE =  0.0065
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.07
  CHANNEL FLOW THRU SUBAREA(CFS) =   41406.80
  FLOW VELOCITY(FEET/SEC.) =  16.43   FLOW DEPTH(FEET) =  10.07
  TRAVEL TIME(MIN.) =   0.47   Tc(MIN.) =   75.86
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12604.00 =  102017.99 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     24913.73   17.00    2.788  0.30( 0.30) 0.99    5408.1   31700.00
      2     25553.69   18.91    2.581  0.30( 0.30) 0.99    6037.3   31800.00
      3     25657.87   19.21    2.549  0.30( 0.30) 0.99    6146.0   40300.00
      4     26048.35   20.41    2.437  0.30( 0.30) 0.99    6566.8   31710.00
      5     26056.65   20.43    2.435  0.30( 0.30) 0.99    6575.8   40200.00
      6     26545.21   22.33    2.307  0.30( 0.30) 0.99    7312.5   31810.00
      7     29638.72   34.17    1.793  0.30( 0.30) 0.99   11863.4   40100.00
      8     31875.13   40.75    1.627  0.30( 0.30) 0.99   14254.3   11831.00
      9     32661.01   43.27    1.570  0.30( 0.30) 0.99   15207.7   11801.00
     10     35679.02   53.18    1.387  0.30( 0.30) 0.99   19503.1   11530.00
```

11	38066.02	62.01	1.306	0.30(0.30)	0.99	24486.9	11910.00
12	40273.26	69.39	1.256	0.30(0.30)	0.99	29093.1	11330.00
13	41406.80	75.86	1.213	0.30(0.30)	0.99	33523.5	11130.00
14	41363.20	83.43	1.163	0.30(0.30)	0.99	37513.7	12330.00
15	41322.96	86.02	1.146	0.30(0.30)	0.99	38930.7	12410.00
16	41165.73	90.04	1.119	0.30(0.30)	0.99	40856.8	12400.00
17	40693.32	98.65	1.080	0.30(0.30)	0.99	44224.1	12201.00
18	40259.79	102.55	1.062	0.30(0.30)	0.99	45310.4	12111.00
19	39976.27	104.91	1.051	0.30(0.30)	0.99	45950.7	10700.00
20	39648.86	107.84	1.038	0.30(0.30)	0.99	46679.8	12101.10
21	39148.89	111.79	1.020	0.30(0.30)	0.99	47530.5	10400.00
22	37654.40	119.58	0.985	0.30(0.30)	0.99	48842.6	12010.00
23	36372.20	125.29	0.969	0.30(0.30)	0.99	49159.2	10210.00
24	36017.30	127.87	0.962	0.30(0.30)	0.99	49268.1	12000.00
25	33037.00	150.81	0.902	0.30(0.30)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 41406.80 Tc(MIN.) = 75.86
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33523.49

****
FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 307.00 DOWNSTREAM(FEET) = 305.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 427.54 CHANNEL SLOPE = 0.0047
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.05
CHANNEL FLOW THRU SUBAREA(CFS) = 41406.80
FLOW VELOCITY(FEET/SEC.) = 14.68 FLOW DEPTH(FEET) = 11.05
TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 76.34
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.00 = 102445.53 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24913.73	17.57	2.727	0.30(0.30)	0.99	5408.1	31700.00
2	25553.69	19.48	2.520	0.30(0.30)	0.99	6037.3	31800.00
3	25657.87	19.78	2.488	0.30(0.30)	0.99	6146.0	40300.00
4	26048.35	20.97	2.399	0.30(0.30)	0.99	6566.8	31710.00
5	26056.65	21.00	2.397	0.30(0.30)	0.99	6575.8	40200.00
6	26545.21	22.89	2.270	0.30(0.30)	0.99	7312.5	31810.00
7	29638.72	34.72	1.779	0.30(0.30)	0.99	11863.4	40100.00
8	31875.13	41.28	1.615	0.30(0.30)	0.99	14254.3	11831.00
9	32661.01	43.80	1.558	0.30(0.30)	0.99	15207.7	11801.00
10	35679.02	53.69	1.381	0.30(0.30)	0.99	19503.1	11530.00
11	38066.02	62.51	1.302	0.30(0.30)	0.99	24486.9	11910.00
12	40273.26	69.88	1.253	0.30(0.30)	0.99	29093.1	11330.00
13	41406.80	76.34	1.210	0.30(0.30)	0.99	33523.5	11130.00

14	41363.20	83.91	1.160	0.30(0.30)	0.99	37513.7	12330.00
15	41322.96	86.51	1.142	0.30(0.30)	0.99	38930.7	12410.00
16	41165.73	90.53	1.117	0.30(0.30)	0.99	40856.8	12400.00
17	40693.32	99.13	1.078	0.30(0.30)	0.99	44224.1	12201.00
18	40259.79	103.04	1.060	0.30(0.30)	0.99	45310.4	12111.00
19	39976.27	105.40	1.049	0.30(0.30)	0.99	45950.7	10700.00
20	39648.86	108.33	1.036	0.30(0.30)	0.99	46679.8	12101.10
21	39148.89	112.29	1.018	0.30(0.30)	0.99	47530.5	10400.00
22	37654.40	120.08	0.983	0.30(0.30)	0.99	48842.6	12010.00
23	36372.20	125.80	0.968	0.30(0.30)	0.99	49159.2	10210.00
24	36017.30	128.38	0.961	0.30(0.30)	0.99	49268.1	12000.00
25	33037.00	151.33	0.901	0.30(0.30)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 41406.80 Tc(MIN.) = 76.34
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33523.49

****
FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========
MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12605.00 TO NODE 12605.30 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 305.00 DOWNSTREAM(FEET) = 302.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 217.28 CHANNEL SLOPE = 0.0138
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.14
CHANNEL FLOW THRU SUBAREA(CFS) = 41406.80
FLOW VELOCITY(FEET/SEC.) = 21.14 FLOW DEPTH(FEET) = 8.14
TRAVEL TIME(MIN.) = 0.17 Tc(MIN.) = 76.51
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24913.73	17.77	2.705	0.30(0.30)	0.99	5408.1	31700.00
2	25553.69	19.68	2.498	0.30(0.30)	0.99	6037.3	31800.00
3	25657.87	19.98	2.466	0.30(0.30)	0.99	6146.0	40300.00
4	26048.35	21.17	2.385	0.30(0.30)	0.99	6566.8	31710.00
5	26056.65	21.20	2.384	0.30(0.30)	0.99	6575.8	40200.00
6	26545.21	23.09	2.256	0.30(0.30)	0.99	7312.5	31810.00
7	29638.72	34.91	1.774	0.30(0.30)	0.99	11863.4	40100.00
8	31875.13	41.47	1.611	0.30(0.30)	0.99	14254.3	11831.00
9	32661.01	43.98	1.554	0.30(0.30)	0.99	15207.7	11801.00
10	35679.02	53.87	1.380	0.30(0.30)	0.99	19503.1	11530.00
11	38066.02	62.69	1.301	0.30(0.30)	0.99	24486.9	11910.00
12	40273.26	70.06	1.252	0.30(0.30)	0.99	29093.1	11330.00
13	41406.80	76.51	1.209	0.30(0.30)	0.99	33523.5	11130.00
14	41363.20	84.08	1.158	0.30(0.30)	0.99	37513.7	12330.00
15	41322.96	86.68	1.141	0.30(0.30)	0.99	38930.7	12410.00

```
    16    41165.73   90.70    1.116  0.30( 0.30) 0.99   40856.8   12400.00
    17    40693.32   99.31    1.077  0.30( 0.30) 0.99   44224.1   12201.00
    18    40259.79  103.21    1.059  0.30( 0.30) 0.99   45310.4   12111.00
    19    39976.27  105.57    1.048  0.30( 0.30) 0.99   45950.7   10700.00
    20    39648.86  108.50    1.035  0.30( 0.30) 0.99   46679.8   12101.10
    21    39148.89  112.46    1.017  0.30( 0.30) 0.99   47530.5   10400.00
    22    37654.40  120.26    0.982  0.30( 0.30) 0.99   48842.6   12010.00
    23    36372.20  125.98    0.967  0.30( 0.30) 0.99   49159.2   10210.00
    24    36017.30  128.56    0.961  0.30( 0.30) 0.99   49268.1   12000.00
    25    33037.00  151.52    0.901  0.30( 0.30) 0.99   49891.2   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41406.80  Tc(MIN.) =   76.51
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   33523.49

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
  ***MEMORY BANK #  3 IS EMPTY - PROCESS IGNORED.***

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610404Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      868.67   17.52  0.30( 0.30) 0.99     396.5   40430.00
      2      857.31   18.07  0.30( 0.30) 0.99     401.1   40440.00
      3      831.27   19.17  0.30( 0.30) 0.99     409.4   40400.00
      4      825.53   19.36  0.30( 0.30) 0.99     410.3   40420.00
      5      824.28   19.40  0.30( 0.30) 0.99     410.5   40410.00
    TOTAL AREA(ACRES) =      410.5

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.30 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24913.73   17.77    2.705  0.30( 0.30) 0.99    5408.1   31700.00
      2    25553.69   19.68    2.498  0.30( 0.30) 0.99    6037.3   31800.00
      3    25657.87   19.98    2.466  0.30( 0.30) 0.99    6146.0   40300.00
      4    26048.35   21.17    2.385  0.30( 0.30) 0.99    6566.8   31710.00
      5    26056.65   21.20    2.384  0.30( 0.30) 0.99    6575.8   40200.00
      6    26545.21   23.09    2.256  0.30( 0.30) 0.99    7312.5   31810.00
      7    29638.72   34.91    1.774  0.30( 0.30) 0.99   11863.4   40100.00
      8    31875.13   41.47    1.611  0.30( 0.30) 0.99   14254.3   11831.00
      9    32661.01   43.98    1.554  0.30( 0.30) 0.99   15207.7   11801.00
     10    35679.02   53.87    1.380  0.30( 0.30) 0.99   19503.1   11530.00
     11    38066.02   62.69    1.301  0.30( 0.30) 0.99   24486.9   11910.00
```



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     12    40273.26   70.06    1.252  0.30( 0.30) 0.99   29093.1   11330.00
     13    41406.80   76.51    1.209  0.30( 0.30) 0.99   33523.5   11130.00
     14    41363.20   84.08    1.158  0.30( 0.30) 0.99   37513.7   12330.00
     15    41322.96   86.68    1.141  0.30( 0.30) 0.99   38930.7   12410.00
     16    41165.73   90.70    1.116  0.30( 0.30) 0.99   40856.8   12400.00
     17    40693.32   99.31    1.077  0.30( 0.30) 0.99   44224.1   12201.00
     18    40259.79  103.21    1.059  0.30( 0.30) 0.99   45310.4   12111.00
     19    39976.27  105.57    1.048  0.30( 0.30) 0.99   45950.7   10700.00
     20    39648.86  108.50    1.035  0.30( 0.30) 0.99   46679.8   12101.10
     21    39148.89  112.46    1.017  0.30( 0.30) 0.99   47530.5   10400.00
     22    37654.40  120.26    0.982  0.30( 0.30) 0.99   48842.6   12010.00
     23    36372.20  125.98    0.967  0.30( 0.30) 0.99   49159.2   10210.00
     24    36017.30  128.56    0.961  0.30( 0.30) 0.99   49268.1   12000.00
     25    33037.00  151.52    0.901  0.30( 0.30) 0.99   49891.2   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      868.67   17.52    2.732  0.30( 0.30) 0.99     396.5   40430.00
    2      857.31   18.07    2.672  0.30( 0.30) 0.99     401.1   40440.00
    3      831.27   19.17    2.553  0.30( 0.30) 0.99     409.4   40400.00
    4      825.53   19.36    2.533  0.30( 0.30) 0.99     410.3   40420.00
    5      824.28   19.40    2.529  0.30( 0.30) 0.99     410.5   40410.00
LONGEST FLOWPATH FROM NODE  40400.00 TO NODE  12605.30 =    7428.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    25707.54   17.52    2.732  0.30( 0.30) 0.99    5728.6   40430.00
    2    25777.23   17.77    2.705  0.30( 0.30) 0.99    5806.7   31700.00
    3    25871.28   18.07    2.672  0.30( 0.30) 0.99    5907.7   40440.00
    4    26213.94   19.17    2.553  0.30( 0.30) 0.99    6278.6   40400.00
    5    26272.51   19.36    2.533  0.30( 0.30) 0.99    6342.7   40420.00
    6    26283.78   19.40    2.529  0.30( 0.30) 0.99    6355.2   40410.00
    7    26366.75   19.68    2.498  0.30( 0.30) 0.99    6447.8   31800.00
    8    26459.00   19.98    2.466  0.30( 0.30) 0.99    6556.4   40300.00
    9    26819.74   21.17    2.385  0.30( 0.30) 0.99    6977.3   31710.00
   10    26827.38   21.20    2.384  0.30( 0.30) 0.99    6986.3   40200.00
   11    27268.87   23.09    2.256  0.30( 0.30) 0.99    7722.9   31810.00
   12    30184.39   34.91    1.774  0.30( 0.30) 0.99   12273.9   40100.00
   13    32360.38   41.47    1.611  0.30( 0.30) 0.99   14664.8   11831.00
   14    33125.27   43.98    1.554  0.30( 0.30) 0.99   15618.2   11801.00
   15    36078.88   53.87    1.380  0.30( 0.30) 0.99   19913.6   11530.00
   16    38436.84   62.69    1.301  0.30( 0.30) 0.99   24897.4   11910.00
   17    40625.93   70.06    1.252  0.30( 0.30) 0.99   29503.6   11330.00
   18    41743.58   76.51    1.209  0.30( 0.30) 0.99   33934.0   11130.00
   19    41681.32   84.08    1.158  0.30( 0.30) 0.99   37924.2   12330.00
   20    41634.69   86.68    1.141  0.30( 0.30) 0.99   39341.2   12410.00
   21    41468.11   90.70    1.116  0.30( 0.30) 0.99   41267.2   12400.00
   22    40981.29   99.31    1.077  0.30( 0.30) 0.99   44634.6   12201.00
   23    40541.21  103.21    1.059  0.30( 0.30) 0.99   45720.9   12111.00
   24    40253.74  105.57    1.048  0.30( 0.30) 0.99   46361.2   10700.00
   25    39921.43  108.50    1.035  0.30( 0.30) 0.99   47090.2   12101.10
   26    39414.83  112.46    1.017  0.30( 0.30) 0.99   47941.0   10400.00
   27    37907.46  120.26    0.982  0.30( 0.30) 0.99   49253.1   12010.00
   28    36619.73  125.98    0.967  0.30( 0.30) 0.99   49569.6   10210.00
   29    36262.35  128.56    0.961  0.30( 0.30) 0.99   49678.6   12000.00
```

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    30    33259.84  151.52    0.901  0.30( 0.30) 0.99   50301.7   10100.00
   TOTAL AREA(ACRES) =     50301.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    41743.58  Tc(MIN.) =   76.513
  EFFECTIVE AREA(ACRES) =  33933.95  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    50301.7
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.30 =  102662.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12605.30 TO NODE  12605.60 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    302.00  DOWNSTREAM(FEET) =    295.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   738.76   CHANNEL SLOPE =  0.0095
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.10
  CHANNEL FLOW THRU SUBAREA(CFS) =   41743.58
  FLOW VELOCITY(FEET/SEC.) =  18.69   FLOW DEPTH(FEET) =   9.10
  TRAVEL TIME(MIN.) =   0.66   Tc(MIN.) =   77.17
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12605.60 =  103401.57 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25707.54   18.30    2.648  0.30( 0.30) 0.99    5728.6   40430.00
      2    25777.23   18.55    2.621  0.30( 0.30) 0.99    5806.7   31700.00
      3    25871.28   18.84    2.589  0.30( 0.30) 0.99    5907.7   40440.00
      4    26213.94   19.94    2.470  0.30( 0.30) 0.99    6278.6   40400.00
      5    26272.51   20.13    2.455  0.30( 0.30) 0.99    6342.7   40420.00
      6    26283.78   20.17    2.453  0.30( 0.30) 0.99    6355.2   40410.00
      7    26366.75   20.45    2.434  0.30( 0.30) 0.99    6447.8   31800.00
      8    26459.00   20.75    2.414  0.30( 0.30) 0.99    6556.4   40300.00
      9    26819.74   21.93    2.334  0.30( 0.30) 0.99    6977.3   31710.00
     10    26827.38   21.96    2.332  0.30( 0.30) 0.99    6986.3   40200.00
     11    27268.87   23.85    2.205  0.30( 0.30) 0.99    7722.9   31810.00
     12    30184.39   35.64    1.756  0.30( 0.30) 0.99   12273.9   40100.00
     13    32360.38   42.18    1.595  0.30( 0.30) 0.99   14664.8   11831.00
     14    33125.27   44.69    1.538  0.30( 0.30) 0.99   15618.2   11801.00
     15    36078.88   54.56    1.373  0.30( 0.30) 0.99   19913.6   11530.00
     16    38436.84   63.37    1.297  0.30( 0.30) 0.99   24897.4   11910.00
     17    40625.93   70.72    1.248  0.30( 0.30) 0.99   29503.6   11330.00
     18    41743.58   77.17    1.205  0.30( 0.30) 0.99   33934.0   11130.00
     19    41681.32   84.74    1.154  0.30( 0.30) 0.99   37924.2   12330.00
     20    41634.69   87.34    1.137  0.30( 0.30) 0.99   39341.2   12410.00
     21    41468.11   91.36    1.113  0.30( 0.30) 0.99   41267.2   12400.00
     22    40981.29   99.97    1.074  0.30( 0.30) 0.99   44634.6   12201.00
     23    40541.21  103.88    1.056  0.30( 0.30) 0.99   45720.9   12111.00
     24    40253.74  106.24    1.045  0.30( 0.30) 0.99   46361.2   10700.00
     25    39921.43  109.17    1.032  0.30( 0.30) 0.99   47090.2   12101.10
     26    39414.83  113.13    1.014  0.30( 0.30) 0.99   47941.0   10400.00
     27    37907.46  120.94    0.981  0.30( 0.30) 0.99   49253.1   12010.00
     28    36619.73  126.66    0.966  0.30( 0.30) 0.99   49569.6   10210.00
     29    36262.35  129.25    0.959  0.30( 0.30) 0.99   49678.6   12000.00
```



```
    30    33259.84  152.23    0.899  0.30( 0.30) 0.99   50301.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41743.58  Tc(MIN.) =   77.17
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   33933.95

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610405Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      203.13   13.78  0.30( 0.30) 1.00      77.2   40510.00
      2      196.61   15.19  0.30( 0.30) 1.00      81.4   40500.00
    TOTAL AREA(ACRES) =       81.4

****************************************************************************
  FLOW PROCESS FROM NODE  12605.60 TO NODE  12605.60 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25707.54   18.30    2.648  0.30( 0.30) 0.99    5728.6   40430.00
      2    25777.23   18.55    2.621  0.30( 0.30) 0.99    5806.7   31700.00
      3    25871.28   18.84    2.589  0.30( 0.30) 0.99    5907.7   40440.00
      4    26213.94   19.94    2.470  0.30( 0.30) 0.99    6278.6   40400.00
      5    26272.51   20.13    2.455  0.30( 0.30) 0.99    6342.7   40420.00
      6    26283.78   20.17    2.453  0.30( 0.30) 0.99    6355.2   40410.00
      7    26366.75   20.45    2.434  0.30( 0.30) 0.99    6447.8   31800.00
      8    26459.00   20.75    2.414  0.30( 0.30) 0.99    6556.4   40300.00
      9    26819.74   21.93    2.334  0.30( 0.30) 0.99    6977.3   31710.00
     10    26827.38   21.96    2.332  0.30( 0.30) 0.99    6986.3   40200.00
     11    27268.87   23.85    2.205  0.30( 0.30) 0.99    7722.9   31810.00
     12    30184.39   35.64    1.756  0.30( 0.30) 0.99   12273.9   40100.00
     13    32360.38   42.18    1.595  0.30( 0.30) 0.99   14664.8   11831.00
     14    33125.27   44.69    1.538  0.30( 0.30) 0.99   15618.2   11801.00
     15    36078.88   54.56    1.373  0.30( 0.30) 0.99   19913.6   11530.00
     16    38436.84   63.37    1.297  0.30( 0.30) 0.99   24897.4   11910.00
     17    40625.93   70.72    1.248  0.30( 0.30) 0.99   29503.6   11330.00
     18    41743.58   77.17    1.205  0.30( 0.30) 0.99   33934.0   11130.00
     19    41681.32   84.74    1.154  0.30( 0.30) 0.99   37924.2   12330.00
     20    41634.69   87.34    1.137  0.30( 0.30) 0.99   39341.2   12410.00
     21    41468.11   91.36    1.113  0.30( 0.30) 0.99   41267.2   12400.00
     22    40981.29   99.97    1.074  0.30( 0.30) 0.99   44634.6   12201.00
     23    40541.21  103.88    1.056  0.30( 0.30) 0.99   45720.9   12111.00
     24    40253.74  106.24    1.045  0.30( 0.30) 0.99   46361.2   10700.00
```

25	39921.43	109.17	1.032	0.30(0.30)	0.99	47090.2	12101.10
26	39414.83	113.13	1.014	0.30(0.30)	0.99	47941.0	10400.00
27	37907.46	120.94	0.981	0.30(0.30)	0.99	49253.1	12010.00
28	36619.73	126.66	0.966	0.30(0.30)	0.99	49569.6	10210.00
29	36262.35	129.25	0.959	0.30(0.30)	0.99	49678.6	12000.00
30	33259.84	152.23	0.899	0.30(0.30)	0.99	50301.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	203.13	13.78	3.222	0.30(0.30)	1.00	77.2	40510.00
2	196.61	15.19	2.984	0.30(0.30)	1.00	81.4	40500.00

LONGEST FLOWPATH FROM NODE 40500.00 TO NODE 12605.60 = 4091.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24296.55	13.78	3.222	0.30(0.30)	0.99	4391.6	40510.00
2	24584.65	15.19	2.984	0.30(0.30)	0.99	4836.5	40500.00
3	25879.56	18.30	2.648	0.30(0.30)	0.99	5809.9	40430.00
4	25947.28	18.55	2.621	0.30(0.30)	0.99	5888.1	31700.00
5	26038.96	18.84	2.589	0.30(0.30)	0.99	5989.1	40440.00
6	26372.95	19.94	2.470	0.30(0.30)	0.99	6359.9	40400.00
7	26430.40	20.13	2.455	0.30(0.30)	0.99	6424.1	40420.00
8	26441.49	20.17	2.453	0.30(0.30)	0.99	6436.5	40410.00
9	26523.08	20.45	2.434	0.30(0.30)	0.99	6529.1	31800.00
10	26613.86	20.75	2.414	0.30(0.30)	0.99	6637.8	40300.00
11	26968.77	21.93	2.334	0.30(0.30)	0.99	7058.6	31710.00
12	26976.28	21.96	2.332	0.30(0.30)	0.99	7067.7	40200.00
13	27408.46	23.85	2.205	0.30(0.30)	0.99	7804.3	31810.00
14	30291.06	35.64	1.756	0.30(0.30)	0.99	12355.3	40100.00
15	32455.25	42.18	1.595	0.30(0.30)	0.99	14746.2	11831.00
16	33216.00	44.69	1.538	0.30(0.30)	0.99	15699.6	11801.00
17	36157.51	54.56	1.373	0.30(0.30)	0.99	19995.0	11530.00
18	38509.88	63.37	1.297	0.30(0.30)	0.99	24978.8	11910.00
19	40695.38	70.72	1.248	0.30(0.30)	0.99	29585.0	11330.00
20	41809.88	77.17	1.205	0.30(0.30)	0.99	34015.3	11130.00
21	41743.93	84.74	1.154	0.30(0.30)	0.99	38005.6	12330.00
22	41696.02	87.34	1.137	0.30(0.30)	0.99	39422.6	12410.00
23	41527.70	91.36	1.113	0.30(0.30)	0.99	41348.6	12400.00
24	41038.02	99.97	1.074	0.30(0.30)	0.99	44716.0	12201.00
25	40596.64	103.88	1.056	0.30(0.30)	0.99	45802.2	12111.00
26	40308.39	106.24	1.045	0.30(0.30)	0.99	46442.6	10700.00
27	39975.10	109.17	1.032	0.30(0.30)	0.99	47171.6	12101.10
28	39467.18	113.13	1.014	0.30(0.30)	0.99	48022.4	10400.00
29	37957.36	120.94	0.981	0.30(0.30)	0.99	49334.5	12010.00
30	36668.54	126.66	0.966	0.30(0.30)	0.99	49651.0	10210.00
31	36310.65	129.25	0.959	0.30(0.30)	0.99	49759.9	12000.00
32	33303.74	152.23	0.899	0.30(0.30)	0.99	50383.1	10100.00

TOTAL AREA(ACRES) = 50383.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 41809.88 Tc(MIN.) = 77.172
EFFECTIVE AREA(ACRES) = 34015.33 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50383.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

****

FLOW PROCESS FROM NODE 12605.60 TO NODE 12606.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 295.00 DOWNSTREAM(FEET) = 286.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1203.43 CHANNEL SLOPE = 0.0075
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.74
CHANNEL FLOW THRU SUBAREA(CFS) = 41809.88
FLOW VELOCITY(FEET/SEC.) = 17.26 FLOW DEPTH(FEET) = 9.74
TRAVEL TIME(MIN.) = 1.16 Tc(MIN.) = 78.33
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24296.55	15.17	2.986	0.30(0.30)	0.99	4391.6	40510.00
2	24584.65	16.57	2.834	0.30(0.30)	0.99	4836.5	40500.00
3	25879.56	19.66	2.501	0.30(0.30)	0.99	5809.9	40430.00
4	25947.28	19.91	2.474	0.30(0.30)	0.99	5888.1	31700.00
5	26038.96	20.20	2.450	0.30(0.30)	0.99	5989.1	40440.00
6	26372.95	21.30	2.377	0.30(0.30)	0.99	6359.9	40400.00
7	26430.40	21.49	2.364	0.30(0.30)	0.99	6424.1	40420.00
8	26441.49	21.52	2.362	0.30(0.30)	0.99	6436.5	40410.00
9	26523.08	21.80	2.343	0.30(0.30)	0.99	6529.1	31800.00
10	26613.86	22.10	2.323	0.30(0.30)	0.99	6637.8	40300.00
11	26968.77	23.28	2.244	0.30(0.30)	0.99	7058.6	31710.00
12	26976.28	23.30	2.242	0.30(0.30)	0.99	7067.7	40200.00
13	27408.46	25.19	2.119	0.30(0.30)	0.99	7804.3	31810.00
14	30291.06	36.93	1.723	0.30(0.30)	0.99	12355.3	40100.00
15	32455.25	43.45	1.566	0.30(0.30)	0.99	14746.2	11831.00
16	33216.00	45.95	1.510	0.30(0.30)	0.99	15699.6	11801.00
17	36157.51	55.78	1.361	0.30(0.30)	0.99	19995.0	11530.00
18	38509.88	64.56	1.289	0.30(0.30)	0.99	24978.8	11910.00
19	40695.38	71.89	1.240	0.30(0.30)	0.99	29585.0	11330.00
20	41809.88	78.33	1.197	0.30(0.30)	0.99	34015.3	11130.00
21	41743.93	85.91	1.146	0.30(0.30)	0.99	38005.6	12330.00
22	41696.02	88.50	1.129	0.30(0.30)	0.99	39422.6	12410.00
23	41527.70	92.53	1.108	0.30(0.30)	0.99	41348.6	12400.00
24	41038.02	101.14	1.069	0.30(0.30)	0.99	44716.0	12201.00
25	40596.64	105.05	1.051	0.30(0.30)	0.99	45802.2	12111.00
26	40308.39	107.42	1.040	0.30(0.30)	0.99	46442.6	10700.00
27	39975.10	110.35	1.027	0.30(0.30)	0.99	47171.6	12101.10
28	39467.18	114.32	1.009	0.30(0.30)	0.99	48022.4	10400.00
29	37957.36	122.14	0.977	0.30(0.30)	0.99	49334.5	12010.00
30	36668.54	127.88	0.962	0.30(0.30)	0.99	49651.0	10210.00
31	36310.65	130.46	0.956	0.30(0.30)	0.99	49759.9	12000.00
32	33303.74	153.48	0.895	0.30(0.30)	0.99	50383.1	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 41809.88 Tc(MIN.) = 78.33
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34015.33

****

```
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610406Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      262.33   20.09  0.30( 0.30) 0.99     135.0   40600.00
    TOTAL AREA(ACRES) =      135.0

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24296.55   15.17    2.986  0.30( 0.30) 0.99    4391.6   40510.00
      2    24584.65   16.57    2.834  0.30( 0.30) 0.99    4836.5   40500.00
      3    25879.56   19.66    2.501  0.30( 0.30) 0.99    5809.9   40430.00
      4    25947.28   19.91    2.474  0.30( 0.30) 0.99    5888.1   31700.00
      5    26038.96   20.20    2.450  0.30( 0.30) 0.99    5989.1   40440.00
      6    26372.95   21.30    2.377  0.30( 0.30) 0.99    6359.9   40400.00
      7    26430.40   21.49    2.364  0.30( 0.30) 0.99    6424.1   40420.00
      8    26441.49   21.52    2.362  0.30( 0.30) 0.99    6436.5   40410.00
      9    26523.08   21.80    2.343  0.30( 0.30) 0.99    6529.1   31800.00
     10    26613.86   22.10    2.323  0.30( 0.30) 0.99    6637.8   40300.00
     11    26968.77   23.28    2.244  0.30( 0.30) 0.99    7058.6   31710.00
     12    26976.28   23.30    2.242  0.30( 0.30) 0.99    7067.7   40200.00
     13    27408.46   25.19    2.119  0.30( 0.30) 0.99    7804.3   31810.00
     14    30291.06   36.93    1.723  0.30( 0.30) 0.99   12355.3   40100.00
     15    32455.25   43.45    1.566  0.30( 0.30) 0.99   14746.2   11831.00
     16    33216.00   45.95    1.510  0.30( 0.30) 0.99   15699.6   11801.00
     17    36157.51   55.78    1.361  0.30( 0.30) 0.99   19995.0   11530.00
     18    38509.88   64.56    1.289  0.30( 0.30) 0.99   24978.8   11910.00
     19    40695.38   71.89    1.240  0.30( 0.30) 0.99   29585.0   11330.00
     20    41809.88   78.33    1.197  0.30( 0.30) 0.99   34015.3   11130.00
     21    41743.93   85.91    1.146  0.30( 0.30) 0.99   38005.6   12330.00
     22    41696.02   88.50    1.129  0.30( 0.30) 0.99   39422.6   12410.00
     23    41527.70   92.53    1.108  0.30( 0.30) 0.99   41348.6   12400.00
     24    41038.02  101.14    1.069  0.30( 0.30) 0.99   44716.0   12201.00
     25    40596.64  105.05    1.051  0.30( 0.30) 0.99   45802.2   12111.00
     26    40308.39  107.42    1.040  0.30( 0.30) 0.99   46442.6   10700.00
     27    39975.10  110.35    1.027  0.30( 0.30) 0.99   47171.6   12101.10
     28    39467.18  114.32    1.009  0.30( 0.30) 0.99   48022.4   10400.00
     29    37957.36  122.14    0.977  0.30( 0.30) 0.99   49334.5   12010.00
     30    36668.54  127.88    0.962  0.30( 0.30) 0.99   49651.0   10210.00
     31    36310.65  130.46    0.956  0.30( 0.30) 0.99   49759.9   12000.00
     32    33303.74  153.48    0.895  0.30( 0.30) 0.99   50383.1   10100.00
```



```
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      262.33   20.09    2.458  0.30( 0.30) 0.99     135.0   40600.00
  LONGEST FLOWPATH FROM NODE  40600.00 TO NODE  12606.00 =    6107.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24543.04   15.17    2.986  0.30( 0.30) 0.99    4493.5   40510.00
      2    24838.76   16.57    2.834  0.30( 0.30) 0.99    4947.8   40500.00
      3    26141.36   19.66    2.501  0.30( 0.30) 0.99    5942.0   40430.00
      4    26209.15   19.91    2.474  0.30( 0.30) 0.99    6021.8   31700.00
      5    26266.47   20.09    2.458  0.30( 0.30) 0.99    6085.7   40600.00
      6    26300.38   20.20    2.450  0.30( 0.30) 0.99    6124.1   40440.00
      7    26625.44   21.30    2.377  0.30( 0.30) 0.99    6494.9   40400.00
      8    26681.34   21.49    2.364  0.30( 0.30) 0.99    6559.1   40420.00
      9    26692.13   21.52    2.362  0.30( 0.30) 0.99    6571.5   40410.00
     10    26771.44   21.80    2.343  0.30( 0.30) 0.99    6664.1   31800.00
     11    26859.79   22.10    2.323  0.30( 0.30) 0.99    6772.8   40300.00
     12    27205.09   23.28    2.244  0.30( 0.30) 0.99    7193.6   31710.00
     13    27212.39   23.30    2.242  0.30( 0.30) 0.99    7202.6   40200.00
     14    27629.68   25.19    2.119  0.30( 0.30) 0.99    7939.3   31810.00
     15    30464.06   36.93    1.723  0.30( 0.30) 0.99   12490.2   40100.00
     16    32609.25   43.45    1.566  0.30( 0.30) 0.99   14881.1   11831.00
     17    33363.13   45.95    1.510  0.30( 0.30) 0.99   15834.5   11801.00
     18    36286.57   55.78    1.361  0.30( 0.30) 0.99   20129.9   11530.00
     19    38630.17   64.56    1.289  0.30( 0.30) 0.99   25113.8   11910.00
     20    40809.73   71.89    1.240  0.30( 0.30) 0.99   29719.9   11330.00
     21    41919.01   78.33    1.197  0.30( 0.30) 0.99   34150.3   11130.00
     22    41846.93   85.91    1.146  0.30( 0.30) 0.99   38140.5   12330.00
     23    41796.92   88.50    1.129  0.30( 0.30) 0.99   39557.6   12410.00
     24    41626.00   92.53    1.108  0.30( 0.30) 0.99   41483.6   12400.00
     25    41131.57  101.14    1.069  0.30( 0.30) 0.99   44850.9   12201.00
     26    40688.04  105.05    1.051  0.30( 0.30) 0.99   45937.2   12111.00
     27    40398.48  107.42    1.040  0.30( 0.30) 0.99   46577.5   10700.00
     28    40063.58  110.35    1.027  0.30( 0.30) 0.99   47306.6   12101.10
     29    39553.48  114.32    1.009  0.30( 0.30) 0.99   48157.3   10400.00
     30    38039.84  122.14    0.977  0.30( 0.30) 0.99   49469.4   12010.00
     31    36749.20  127.88    0.962  0.30( 0.30) 0.99   49786.0   10210.00
     32    36390.49  130.46    0.956  0.30( 0.30) 0.99   49894.9   12000.00
     33    33376.27  153.48    0.895  0.30( 0.30) 0.99   50518.0   10100.00
    TOTAL AREA(ACRES) =     50518.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    41919.01  Tc(MIN.) =   78.334
  EFFECTIVE AREA(ACRES) =  34150.30  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    50518.0
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12606.00 =  104605.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    50518.0  TC(MIN.) =     78.33
  EFFECTIVE AREA(ACRES) =  34150.30  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.994
  PEAK FLOW RATE(CFS)   =   41919.01
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24543.04	15.17	2.986	0.30(0.30)	0.99	4493.5	40510.00
2	24838.76	16.57	2.834	0.30(0.30)	0.99	4947.8	40500.00
3	26141.36	19.66	2.501	0.30(0.30)	0.99	5942.0	40430.00
4	26209.15	19.91	2.474	0.30(0.30)	0.99	6021.8	31700.00
5	26266.47	20.09	2.458	0.30(0.30)	0.99	6085.7	40600.00
6	26300.38	20.20	2.450	0.30(0.30)	0.99	6124.1	40440.00
7	26625.44	21.30	2.377	0.30(0.30)	0.99	6494.9	40400.00
8	26681.34	21.49	2.364	0.30(0.30)	0.99	6559.1	40420.00
9	26692.13	21.52	2.362	0.30(0.30)	0.99	6571.5	40410.00
10	26771.44	21.80	2.343	0.30(0.30)	0.99	6664.1	31800.00
11	26859.79	22.10	2.323	0.30(0.30)	0.99	6772.8	40300.00
12	27205.09	23.28	2.244	0.30(0.30)	0.99	7193.6	31710.00
13	27212.39	23.30	2.242	0.30(0.30)	0.99	7202.6	40200.00
14	27629.68	25.19	2.119	0.30(0.30)	0.99	7939.3	31810.00
15	30464.06	36.93	1.723	0.30(0.30)	0.99	12490.2	40100.00
16	32609.25	43.45	1.566	0.30(0.30)	0.99	14881.1	11831.00
17	33363.13	45.95	1.510	0.30(0.30)	0.99	15834.5	11801.00
18	36286.57	55.78	1.361	0.30(0.30)	0.99	20129.9	11530.00
19	38630.17	64.56	1.289	0.30(0.30)	0.99	25113.8	11910.00
20	40809.73	71.89	1.240	0.30(0.30)	0.99	29719.9	11330.00
21	41919.01	78.33	1.197	0.30(0.30)	0.99	34150.3	11130.00
22	41846.93	85.91	1.146	0.30(0.30)	0.99	38140.5	12330.00
23	41796.92	88.50	1.129	0.30(0.30)	0.99	39557.6	12410.00
24	41626.00	92.53	1.108	0.30(0.30)	0.99	41483.6	12400.00
25	41131.57	101.14	1.069	0.30(0.30)	0.99	44850.9	12201.00
26	40688.04	105.05	1.051	0.30(0.30)	0.99	45937.2	12111.00
27	40398.48	107.42	1.040	0.30(0.30)	0.99	46577.5	10700.00
28	40063.58	110.35	1.027	0.30(0.30)	0.99	47306.6	12101.10
29	39553.48	114.32	1.009	0.30(0.30)	0.99	48157.3	10400.00
30	38039.84	122.14	0.977	0.30(0.30)	0.99	49469.4	12010.00
31	36749.20	127.88	0.962	0.30(0.30)	0.99	49786.0	10210.00
32	36390.49	130.46	0.956	0.30(0.30)	0.99	49894.9	12000.00
33	33376.27	153.48	0.895	0.30(0.30)	0.99	50518.0	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S27.DAT
  TIME/DATE OF STUDY: 08:14 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.035
   2)   10.00;  3.868
   3)   15.00;  2.984
   4)   20.00;  2.451
   5)   25.00;  2.119
   6)   30.00;  1.892
   7)   40.00;  1.636
   8)   50.00;  1.413
   9)   60.00;  1.311
  10)   90.00;  1.110
  11)  120.00;  0.974
  12)  180.00;  0.817
  13)  360.00;  0.608
  14) 1200.00;  0.267
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S26.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    24838.76   16.57  0.30( 0.30) 0.99    4947.8   40500.00
      2    26300.38   20.20  0.30( 0.30) 0.99    6124.1   40440.00
      3    27629.68   25.19  0.30( 0.30) 0.99    7939.3   31810.00
      4    30464.06   36.93  0.30( 0.30) 0.99   12490.2   40100.00
      5    33363.13   45.95  0.30( 0.30) 0.99   15834.5   11801.00
      6    36286.57   55.78  0.30( 0.30) 0.99   20129.9   11530.00
      7    38630.17   64.56  0.30( 0.30) 0.99   25113.8   11910.00
      8    40809.73   71.89  0.30( 0.30) 0.99   29719.9   11330.00
      9    41919.01   78.33  0.30( 0.30) 0.99   34150.3   11130.00
     10    41846.93   85.91  0.30( 0.30) 0.99   38140.5   12330.00
     11    41796.92   88.50  0.30( 0.30) 0.99   39557.6   12410.00
     12    41626.00   92.53  0.30( 0.30) 0.99   41483.6   12400.00
     13    41131.57  101.14  0.30( 0.30) 0.99   44850.9   12201.00
     14    40688.04  105.05  0.30( 0.30) 0.99   45937.2   12111.00
     15    40063.58  110.35  0.30( 0.30) 0.99   47306.6   12101.10
     16    39553.48  114.32  0.30( 0.30) 0.99   48157.3   10400.00
     17    38039.84  122.14  0.30( 0.30) 0.99   49469.4   12010.00
     18    36749.20  127.88  0.30( 0.30) 0.99   49786.0   10210.00
     19    36390.49  130.46  0.30( 0.30) 0.99   49894.9   12000.00
     20    33376.27  153.48  0.30( 0.30) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =    50518.0

**************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12606.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    24838.76   16.57  0.30( 0.30) 0.99    4947.8   40500.00
      2    26300.38   20.20  0.30( 0.30) 0.99    6124.1   40440.00
      3    27629.68   25.19  0.30( 0.30) 0.99    7939.3   31810.00
      4    30464.06   36.93  0.30( 0.30) 0.99   12490.2   40100.00
      5    33363.13   45.95  0.30( 0.30) 0.99   15834.5   11801.00
      6    36286.57   55.78  0.30( 0.30) 0.99   20129.9   11530.00
      7    38630.17   64.56  0.30( 0.30) 0.99   25113.8   11910.00
      8    40809.73   71.89  0.30( 0.30) 0.99   29719.9   11330.00
      9    41919.01   78.33  0.30( 0.30) 0.99   34150.3   11130.00
     10    41846.93   85.91  0.30( 0.30) 0.99   38140.5   12330.00
     11    41796.92   88.50  0.30( 0.30) 0.99   39557.6   12410.00
     12    41626.00   92.53  0.30( 0.30) 0.99   41483.6   12400.00
     13    41131.57  101.14  0.30( 0.30) 0.99   44850.9   12201.00
     14    40688.04  105.05  0.30( 0.30) 0.99   45937.2   12111.00
     15    40063.58  110.35  0.30( 0.30) 0.99   47306.6   12101.10
     16    39553.48  114.32  0.30( 0.30) 0.99   48157.3   10400.00
     17    38039.84  122.14  0.30( 0.30) 0.99   49469.4   12010.00
     18    36749.20  127.88  0.30( 0.30) 0.99   49786.0   10210.00
```

```
    19    36390.49  130.46  0.30( 0.30) 0.99   49894.9   12000.00
    20    33376.27  153.48  0.30( 0.30) 0.99   50518.0   10100.00
   TOTAL AREA(ACRES) =     50518.0

****************************************************************************
  FLOW PROCESS FROM NODE  12606.00 TO NODE  12701.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    286.00  DOWNSTREAM(FEET) =    276.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.19   CHANNEL SLOPE =  0.0079
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.180
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.55      0.30     0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   41922.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.62
  AVERAGE FLOW DEPTH(FEET) =   9.59   TRAVEL TIME(MIN.) =   1.19
  Tc(MIN.) =   79.53
  SUBAREA AREA(ACRES) =     7.55       SUBAREA RUNOFF(CFS) =    6.21
  EFFECTIVE AREA(ACRES) =  34157.85     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50525.6         PEAK FLOW RATE(CFS) =   41919.01
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.59   FLOW VELOCITY(FEET/SEC.) =  17.62
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12701.00 =  105865.19 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24838.76   17.99    2.665  0.30( 0.30) 0.99    4955.4   40500.00
      2    26300.38   21.59    2.345  0.30( 0.30) 0.99    6131.6   40440.00
      3    27629.68   26.55    2.048  0.30( 0.30) 0.99    7946.8   31810.00
      4    30464.06   38.26    1.681  0.30( 0.30) 0.99   12497.8   40100.00
      5    33363.13   47.23    1.475  0.30( 0.30) 0.99   15842.1   11801.00
      6    36286.57   57.03    1.341  0.30( 0.30) 0.99   20137.5   11530.00
      7    38630.17   65.78    1.272  0.30( 0.30) 0.99   25121.3   11910.00
      8    40809.73   73.10    1.223  0.30( 0.30) 0.99   29727.5   11330.00
      9    41919.01   79.53    1.180  0.30( 0.30) 0.99   34157.9   11130.00
     10    41846.93   87.10    1.129  0.30( 0.30) 0.99   38148.1   12330.00
     11    41796.92   89.70    1.112  0.30( 0.30) 0.99   39565.1   12410.00
     12    41626.00   93.72    1.093  0.30( 0.30) 0.99   41491.1   12400.00
     13    41131.57  102.34    1.054  0.30( 0.30) 0.99   44858.5   12201.00
     14    40688.04  106.25    1.036  0.30( 0.30) 0.99   45944.8   12111.00
     15    40063.58  111.56    1.012  0.30( 0.30) 0.99   47314.1   12101.10
     16    39553.48  115.53    0.994  0.30( 0.30) 0.99   48164.9   10400.00
```



```
     17    38039.84  123.37    0.965  0.30( 0.30) 0.99   49477.0   12010.00
     18    36749.20  129.12    0.950  0.30( 0.30) 0.99   49793.5   10210.00
     19    36390.49  131.71    0.943  0.30( 0.30) 0.99   49902.5   12000.00
     20    33376.27  154.77    0.883  0.30( 0.30) 0.99   50525.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41919.01  Tc(MIN.) =   79.53
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34157.85

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    276.00  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   147.65   CHANNEL SLOPE =  0.0068
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.179
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        1.49      0.30     0.972     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.972
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   41919.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.71
  AVERAGE FLOW DEPTH(FEET) =  10.03   TRAVEL TIME(MIN.) =   0.15
  Tc(MIN.) =   79.67
  SUBAREA AREA(ACRES) =     1.49       SUBAREA RUNOFF(CFS) =    1.19
  EFFECTIVE AREA(ACRES) =  34159.34     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    50527.1         PEAK FLOW RATE(CFS) =   41919.01
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 10.03   FLOW VELOCITY(FEET/SEC.) =  16.71
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24838.76   18.17    2.646  0.30( 0.30) 0.99    4956.9   40500.00
      2    26300.38   21.77    2.334  0.30( 0.30) 0.99    6133.1   40440.00
      3    27629.68   26.72    2.041  0.30( 0.30) 0.99    7948.3   31810.00
      4    30464.06   38.42    1.676  0.30( 0.30) 0.99   12499.3   40100.00
      5    33363.13   47.39    1.471  0.30( 0.30) 0.99   15843.6   11801.00
      6    36286.57   57.18    1.340  0.30( 0.30) 0.99   20139.0   11530.00
      7    38630.17   65.93    1.271  0.30( 0.30) 0.99   25122.8   11910.00
      8    40809.73   73.24    1.222  0.30( 0.30) 0.99   29729.0   11330.00
      9    41919.01   79.67    1.179  0.30( 0.30) 0.99   34159.3   11130.00
     10    41846.93   87.25    1.128  0.30( 0.30) 0.99   38149.6   12330.00
     11    41796.92   89.84    1.111  0.30( 0.30) 0.99   39566.6   12410.00
```

```
    12    41626.00   93.87    1.092  0.30( 0.30) 0.99   41492.6   12400.00
    13    41131.57  102.49    1.053  0.30( 0.30) 0.99   44860.0   12201.00
    14    40688.04  106.40    1.036  0.30( 0.30) 0.99   45946.3   12111.00
    15    40063.58  111.71    1.012  0.30( 0.30) 0.99   47315.6   12101.10
    16    39553.48  115.68    0.994  0.30( 0.30) 0.99   48166.4   10400.00
    17    38039.84  123.52    0.965  0.30( 0.30) 0.99   49478.5   12010.00
    18    36749.20  129.27    0.950  0.30( 0.30) 0.99   49795.0   10210.00
    19    36390.49  131.86    0.943  0.30( 0.30) 0.99   49904.0   12000.00
    20    33376.27  154.92    0.883  0.30( 0.30) 0.99   50527.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   41919.01  Tc(MIN.) =   79.67
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34159.34

****************************************************************************
  FLOW PROCESS FROM NODE  12701.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   79.67
  RAINFALL INTENSITY(INCH/HR) =   1.18
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =   34159.34
  TOTAL STREAM AREA(ACRES) =   50527.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   41919.01

****************************************************************************
  FLOW PROCESS FROM NODE  12710.00 TO NODE  12711.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   943.56
  ELEVATION DATA: UPSTREAM(FEET) =    940.78  DOWNSTREAM(FEET) =    657.79

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.910
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.177
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.56      0.30     1.000     0   13.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     16.99
  TOTAL AREA(ACRES) =      6.56   PEAK FLOW RATE(CFS) =     16.99

****************************************************************************
  FLOW PROCESS FROM NODE  12711.00 TO NODE  12712.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    657.79  DOWNSTREAM(FEET) =    585.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =   766.00   CHANNEL SLOPE =  0.0942
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.859
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       26.94      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.64
  AVERAGE FLOW DEPTH(FEET) =   0.74   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   16.18
  SUBAREA AREA(ACRES) =    26.94       SUBAREA RUNOFF(CFS) =   62.04
  EFFECTIVE AREA(ACRES) =     33.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       33.5         PEAK FLOW RATE(CFS) =      77.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   6.63
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12712.00 =    1709.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12712.00 TO NODE  12713.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.63  DOWNSTREAM(FEET) =    463.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.79   CHANNEL SLOPE =  0.1188
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.619
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.73      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      92.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.60
  AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   2.25
  Tc(MIN.) =   18.42
  SUBAREA AREA(ACRES) =    14.73       SUBAREA RUNOFF(CFS) =   30.75
  EFFECTIVE AREA(ACRES) =     48.23     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       48.2         PEAK FLOW RATE(CFS) =     100.67
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06
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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   7.81
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12713.00 =    2735.35 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12713.00 TO NODE  12714.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    463.75  DOWNSTREAM(FEET) =    360.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1148.54   CHANNEL SLOPE =  0.0901
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.412
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      105.64      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     201.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.84
  AVERAGE FLOW DEPTH(FEET) =   1.70   TRAVEL TIME(MIN.) =   2.17
  Tc(MIN.) =   20.59
  SUBAREA AREA(ACRES) =   105.64       SUBAREA RUNOFF(CFS) =  200.80
  EFFECTIVE AREA(ACRES) =    153.87     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      153.9         PEAK FLOW RATE(CFS) =     292.48
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.09   FLOW VELOCITY(FEET/SEC.) =   9.88
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12714.00 =    3883.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    360.30  DOWNSTREAM(FEET) =    275.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1314.99   CHANNEL SLOPE =  0.0649
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.261
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      127.13      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     404.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.64
```



```
  AVERAGE FLOW DEPTH(FEET) =   2.72   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   22.86
  SUBAREA AREA(ACRES) =   127.13       SUBAREA RUNOFF(CFS) =  224.38
  EFFECTIVE AREA(ACRES) =    281.00     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      281.0         PEAK FLOW RATE(CFS) =     495.95
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.02   FLOW VELOCITY(FEET/SEC.) =  10.22
  LONGEST FLOWPATH FROM NODE  12710.00 TO NODE  12720.00 =    5198.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12714.00 TO NODE  12720.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.86
  RAINFALL INTENSITY(INCH/HR) =   2.26
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     281.00
  TOTAL STREAM AREA(ACRES) =     281.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     495.95

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1    24838.76   18.17    2.646  0.30( 0.30) 0.99    4956.9   40500.00
      1    26300.38   21.77    2.334  0.30( 0.30) 0.99    6133.1   40440.00
      1    27629.68   26.72    2.041  0.30( 0.30) 0.99    7948.3   31810.00
      1    30464.06   38.42    1.676  0.30( 0.30) 0.99   12499.3   40100.00
      1    33363.13   47.39    1.471  0.30( 0.30) 0.99   15843.6   11801.00
      1    36286.57   57.18    1.340  0.30( 0.30) 0.99   20139.0   11530.00
      1    38630.17   65.93    1.271  0.30( 0.30) 0.99   25122.8   11910.00
      1    40809.73   73.24    1.222  0.30( 0.30) 0.99   29729.0   11330.00
      1    41919.01   79.67    1.179  0.30( 0.30) 0.99   34159.3   11130.00
      1    41846.93   87.25    1.128  0.30( 0.30) 0.99   38149.6   12330.00
      1    41796.92   89.84    1.111  0.30( 0.30) 0.99   39566.6   12410.00
      1    41626.00   93.87    1.092  0.30( 0.30) 0.99   41492.6   12400.00
      1    41131.57  102.49    1.053  0.30( 0.30) 0.99   44860.0   12201.00
      1    40688.04  106.40    1.036  0.30( 0.30) 0.99   45946.3   12111.00
      1    40063.58  111.71    1.012  0.30( 0.30) 0.99   47315.6   12101.10
      1    39553.48  115.68    0.994  0.30( 0.30) 0.99   48166.4   10400.00
      1    38039.84  123.52    0.965  0.30( 0.30) 0.99   49478.5   12010.00
      1    36749.20  129.27    0.950  0.30( 0.30) 0.99   49795.0   10210.00
      1    36390.49  131.86    0.943  0.30( 0.30) 0.99   49904.0   12000.00
      1    33376.27  154.92    0.883  0.30( 0.30) 0.99   50527.1   10100.00
      2      495.95   22.86    2.261  0.30( 0.30) 1.00     281.0   12710.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25310.32	18.17	2.646	0.30(0.30)	0.99	5180.2	40500.00
2	26790.08	21.77	2.334	0.30(0.30)	0.99	6400.7	40440.00
3	27090.10	22.86	2.261	0.30(0.30)	0.99	6815.3	12710.00
4	28069.94	26.72	2.041	0.30(0.30)	0.99	8229.3	31810.00
5	30812.19	38.42	1.676	0.30(0.30)	0.99	12780.3	40100.00
6	33659.35	47.39	1.471	0.30(0.30)	0.99	16124.6	11801.00
7	36549.53	57.18	1.340	0.30(0.30)	0.99	20420.0	11530.00
8	38875.82	65.93	1.271	0.30(0.30)	0.99	25403.8	11910.00
9	41042.99	73.24	1.222	0.30(0.30)	0.99	30010.0	11330.00
10	42141.38	79.67	1.179	0.30(0.30)	0.99	34440.3	11130.00
11	42056.46	87.25	1.128	0.30(0.30)	0.99	38430.6	12330.00
12	42002.05	89.84	1.111	0.30(0.30)	0.99	39847.6	12410.00
13	41826.43	93.87	1.092	0.30(0.30)	0.99	41773.6	12400.00
14	41322.12	102.49	1.053	0.30(0.30)	0.99	45141.0	12201.00
15	40874.10	106.40	1.036	0.30(0.30)	0.99	46227.3	12111.00
16	40243.55	111.71	1.012	0.30(0.30)	0.99	47596.6	12101.10
17	39728.90	115.68	0.994	0.30(0.30)	0.99	48447.4	10400.00
18	38207.98	123.52	0.965	0.30(0.30)	0.99	49759.5	12010.00
19	36913.53	129.27	0.950	0.30(0.30)	0.99	50076.0	10210.00
20	36553.11	131.86	0.943	0.30(0.30)	0.99	50185.0	12000.00
21	33523.62	154.92	0.883	0.30(0.30)	0.99	50808.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 42141.38 Tc(MIN.) = 79.67
EFFECTIVE AREA(ACRES) = 34440.34 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50808.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========
MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610316Y.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	380.56	25.00	0.30(0.30)	0.98	231.4	31600.00

TOTAL AREA(ACRES) = 231.4

****
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25310.32	18.17	2.646	0.30(0.30)	0.99	5180.2	40500.00
2	26790.08	21.77	2.334	0.30(0.30)	0.99	6400.7	40440.00
3	27090.10	22.86	2.261	0.30(0.30)	0.99	6815.3	12710.00
4	28069.94	26.72	2.041	0.30(0.30)	0.99	8229.3	31810.00
5	30812.19	38.42	1.676	0.30(0.30)	0.99	12780.3	40100.00
6	33659.35	47.39	1.471	0.30(0.30)	0.99	16124.6	11801.00
7	36549.53	57.18	1.340	0.30(0.30)	0.99	20420.0	11530.00
8	38875.82	65.93	1.271	0.30(0.30)	0.99	25403.8	11910.00
9	41042.99	73.24	1.222	0.30(0.30)	0.99	30010.0	11330.00
10	42141.38	79.67	1.179	0.30(0.30)	0.99	34440.3	11130.00
11	42056.46	87.25	1.128	0.30(0.30)	0.99	38430.6	12330.00
12	42002.05	89.84	1.111	0.30(0.30)	0.99	39847.6	12410.00
13	41826.43	93.87	1.092	0.30(0.30)	0.99	41773.6	12400.00
14	41322.12	102.49	1.053	0.30(0.30)	0.99	45141.0	12201.00
15	40874.10	106.40	1.036	0.30(0.30)	0.99	46227.3	12111.00
16	40243.55	111.71	1.012	0.30(0.30)	0.99	47596.6	12101.10
17	39728.90	115.68	0.994	0.30(0.30)	0.99	48447.4	10400.00
18	38207.98	123.52	0.965	0.30(0.30)	0.99	49759.5	12010.00
19	36913.53	129.27	0.950	0.30(0.30)	0.99	50076.0	10210.00
20	36553.11	131.86	0.943	0.30(0.30)	0.99	50185.0	12000.00
21	33523.62	154.92	0.883	0.30(0.30)	0.99	50808.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	380.56	25.00	2.119	0.30(0.30)	0.98	231.4	31600.00

LONGEST FLOWPATH FROM NODE 31600.00 TO NODE 12720.00 = 7759.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25666.84	18.17	2.646	0.30(0.30)	0.99	5348.3	40500.00
2	27160.42	21.77	2.334	0.30(0.30)	0.99	6602.2	40440.00
3	27465.20	22.86	2.261	0.30(0.30)	0.99	7026.9	12710.00
4	28012.13	25.00	2.119	0.30(0.30)	0.99	7828.1	31600.00
5	28434.11	26.72	2.041	0.30(0.30)	0.99	8460.7	31810.00
6	31100.36	38.42	1.676	0.30(0.30)	0.99	13011.7	40100.00
7	33904.71	47.39	1.471	0.30(0.30)	0.99	16356.0	11801.00
8	36767.45	57.18	1.340	0.30(0.30)	0.99	20651.4	11530.00
9	39079.45	65.93	1.271	0.30(0.30)	0.99	25635.2	11910.00
10	41236.40	73.24	1.222	0.30(0.30)	0.99	30241.4	11330.00
11	42325.80	79.67	1.179	0.30(0.30)	0.99	34671.7	11130.00
12	42230.30	87.25	1.128	0.30(0.30)	0.99	38662.0	12330.00
13	42172.27	89.84	1.111	0.30(0.30)	0.99	40079.0	12410.00
14	41992.76	93.87	1.092	0.30(0.30)	0.99	42005.0	12400.00
15	41480.31	102.49	1.053	0.30(0.30)	0.99	45372.4	12201.00
16	41028.58	106.40	1.036	0.30(0.30)	0.99	46458.6	12111.00
17	40393.02	111.71	1.012	0.30(0.30)	0.99	47828.0	12101.10
18	39874.61	115.68	0.994	0.30(0.30)	0.99	48678.8	10400.00
19	38347.68	123.52	0.965	0.30(0.30)	0.99	49990.9	12010.00
20	37050.09	129.27	0.950	0.30(0.30)	0.99	50307.4	10210.00
21	36688.26	131.86	0.943	0.30(0.30)	0.99	50416.4	12000.00
22	33646.18	154.92	0.883	0.30(0.30)	0.99	51039.5	10100.00

TOTAL AREA(ACRES) = 51039.5

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    42325.80  Tc(MIN.) =   79.673
  EFFECTIVE AREA(ACRES) =  34671.73  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51039.5
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.00 =  106012.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.00 TO NODE  12720.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    275.00  DOWNSTREAM(FEET) =    258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2669.21   CHANNEL SLOPE =  0.0064
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.26
  CHANNEL FLOW THRU SUBAREA(CFS) =   42325.80
  FLOW VELOCITY(FEET/SEC.) =  16.42   FLOW DEPTH(FEET) =  10.26
  TRAVEL TIME(MIN.) =   2.71   Tc(MIN.) =   82.38
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25666.84   21.36    2.361  0.30( 0.30) 0.99    5348.3   40500.00
      2    27160.42   24.90    2.126  0.30( 0.30) 0.99    6602.2   40440.00
      3    27465.20   25.98    2.074  0.30( 0.30) 0.99    7026.9   12710.00
      4    28012.13   28.10    1.978  0.30( 0.30) 0.99    7828.1   31600.00
      5    28434.11   29.81    1.901  0.30( 0.30) 0.99    8460.7   31810.00
      6    31100.36   41.42    1.604  0.30( 0.30) 0.99   13011.7   40100.00
      7    33904.71   50.30    1.410  0.30( 0.30) 0.99   16356.0   11801.00
      8    36767.45   60.02    1.311  0.30( 0.30) 0.99   20651.4   11530.00
      9    39079.45   68.71    1.253  0.30( 0.30) 0.99   25635.2   11910.00
     10    41236.40   75.98    1.204  0.30( 0.30) 0.99   30241.4   11330.00
     11    42325.80   82.38    1.161  0.30( 0.30) 0.99   34671.7   11130.00
     12    42230.30   89.96    1.110  0.30( 0.30) 0.99   38662.0   12330.00
     13    42172.27   92.56    1.098  0.30( 0.30) 0.99   40079.0   12410.00
     14    41992.76   96.58    1.080  0.30( 0.30) 0.99   42005.0   12400.00
     15    41480.31  105.21    1.041  0.30( 0.30) 0.99   45372.4   12201.00
     16    41028.58  109.14    1.023  0.30( 0.30) 0.99   46458.6   12111.00
     17    40393.02  114.46    0.999  0.30( 0.30) 0.99   47828.0   12101.10
     18    39874.61  118.44    0.981  0.30( 0.30) 0.99   48678.8   10400.00
     19    38347.68  126.32    0.957  0.30( 0.30) 0.99   49990.9   12010.00
     20    37050.09  132.10    0.942  0.30( 0.30) 0.99   50307.4   10210.00
     21    36688.26  134.70    0.936  0.30( 0.30) 0.99   50416.4   12000.00
     22    33646.18  157.84    0.875  0.30( 0.30) 0.99   51039.5   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   42325.80  Tc(MIN.) =   82.38
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34671.73

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
```



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============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610315Y.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      120.73   23.57  0.30( 0.25) 0.83      68.1   31500.00
    TOTAL AREA(ACRES) =       68.1

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12720.50 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25666.84   21.36    2.361  0.30( 0.30) 0.99    5348.3   40500.00
      2    27160.42   24.90    2.126  0.30( 0.30) 0.99    6602.2   40440.00
      3    27465.20   25.98    2.074  0.30( 0.30) 0.99    7026.9   12710.00
      4    28012.13   28.10    1.978  0.30( 0.30) 0.99    7828.1   31600.00
      5    28434.11   29.81    1.901  0.30( 0.30) 0.99    8460.7   31810.00
      6    31100.36   41.42    1.604  0.30( 0.30) 0.99   13011.7   40100.00
      7    33904.71   50.30    1.410  0.30( 0.30) 0.99   16356.0   11801.00
      8    36767.45   60.02    1.311  0.30( 0.30) 0.99   20651.4   11530.00
      9    39079.45   68.71    1.253  0.30( 0.30) 0.99   25635.2   11910.00
     10    41236.40   75.98    1.204  0.30( 0.30) 0.99   30241.4   11330.00
     11    42325.80   82.38    1.161  0.30( 0.30) 0.99   34671.7   11130.00
     12    42230.30   89.96    1.110  0.30( 0.30) 0.99   38662.0   12330.00
     13    42172.27   92.56    1.098  0.30( 0.30) 0.99   40079.0   12410.00
     14    41992.76   96.58    1.080  0.30( 0.30) 0.99   42005.0   12400.00
     15    41480.31  105.21    1.041  0.30( 0.30) 0.99   45372.4   12201.00
     16    41028.58  109.14    1.023  0.30( 0.30) 0.99   46458.6   12111.00
     17    40393.02  114.46    0.999  0.30( 0.30) 0.99   47828.0   12101.10
     18    39874.61  118.44    0.981  0.30( 0.30) 0.99   48678.8   10400.00
     19    38347.68  126.32    0.957  0.30( 0.30) 0.99   49990.9   12010.00
     20    37050.09  132.10    0.942  0.30( 0.30) 0.99   50307.4   10210.00
     21    36688.26  134.70    0.936  0.30( 0.30) 0.99   50416.4   12000.00
     22    33646.18  157.84    0.875  0.30( 0.30) 0.99   51039.5   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      120.73   23.57    2.214  0.30( 0.25) 0.83      68.1   31500.00
  LONGEST FLOWPATH FROM NODE  31500.00 TO NODE  12720.50 =    4043.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25784.42   21.36    2.361  0.30( 0.30) 0.99    5410.1   40500.00
      2    26718.97   23.57    2.214  0.30( 0.30) 0.99    6198.3   31500.00
```

```
      3    27275.72   24.90    2.126  0.30( 0.30) 0.99    6670.2   40440.00
      4    27577.35   25.98    2.074  0.30( 0.30) 0.99    7095.0   12710.00
      5    28118.38   28.10    1.978  0.30( 0.30) 0.99    7896.2   31600.00
      6    28535.59   29.81    1.901  0.30( 0.30) 0.99    8528.8   31810.00
      7    31183.66   41.42    1.604  0.30( 0.30) 0.99   13079.8   40100.00
      8    33976.06   50.30    1.410  0.30( 0.30) 0.99   16424.1   11801.00
      9    36832.73   60.02    1.311  0.30( 0.30) 0.99   20719.5   11530.00
     10    39141.14   68.71    1.253  0.30( 0.30) 0.99   25703.3   11910.00
     11    41295.11   75.98    1.204  0.30( 0.30) 0.99   30309.5   11330.00
     12    42381.88   82.38    1.161  0.30( 0.30) 0.99   34739.8   11130.00
     13    42283.26   89.96    1.110  0.30( 0.30) 0.99   38730.1   12330.00
     14    42224.50   92.56    1.098  0.30( 0.30) 0.99   40147.1   12410.00
     15    42043.87   96.58    1.080  0.30( 0.30) 0.99   42073.1   12400.00
     16    41529.01  105.21    1.041  0.30( 0.30) 0.99   45440.5   12201.00
     17    41076.19  109.14    1.023  0.30( 0.30) 0.99   46526.7   12111.00
     18    40439.15  114.46    0.999  0.30( 0.30) 0.99   47896.1   12101.10
     19    39919.63  118.44    0.981  0.30( 0.30) 0.99   48746.9   10400.00
     20    38391.25  126.32    0.957  0.30( 0.30) 0.99   50059.0   12010.00
     21    37092.73  132.10    0.942  0.30( 0.30) 0.99   50375.5   10210.00
     22    36730.48  134.70    0.936  0.30( 0.30) 0.99   50484.4   12000.00
     23    33684.69  157.84    0.875  0.30( 0.30) 0.99   51107.6   10100.00
   TOTAL AREA(ACRES) =     51107.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    42381.88  Tc(MIN.) =   82.382
  EFFECTIVE AREA(ACRES) =  34739.83  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51107.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12720.50 =  108682.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12720.50 TO NODE  12721.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    256.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   438.77   CHANNEL SLOPE =  0.0046
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.158
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.15      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   42405.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.66
  AVERAGE FLOW DEPTH(FEET) =  11.28   TRAVEL TIME(MIN.) =   0.50
  Tc(MIN.) =   82.88
  SUBAREA AREA(ACRES) =    62.15       SUBAREA RUNOFF(CFS) =   47.98
  EFFECTIVE AREA(ACRES) =  34801.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    51169.7         PEAK FLOW RATE(CFS) =   42381.88
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.27   FLOW VELOCITY(FEET/SEC.) =  14.66
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12721.00 =  109120.82 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    25784.42   21.95    2.322  0.30( 0.30) 0.99    5472.2   40500.00
      2    26718.97   24.15    2.176  0.30( 0.30) 0.99    6260.5   31500.00
      3    27275.72   25.48    2.097  0.30( 0.30) 0.99    6732.4   40440.00
      4    27577.35   26.56    2.048  0.30( 0.30) 0.99    7157.2   12710.00
      5    28118.38   28.67    1.952  0.30( 0.30) 0.99    7958.3   31600.00
      6    28535.59   30.38    1.882  0.30( 0.30) 0.99    8591.0   31810.00
      7    31183.66   41.97    1.592  0.30( 0.30) 0.99   13141.9   40100.00
      8    33976.06   50.84    1.404  0.30( 0.30) 0.99   16486.2   11801.00
      9    36832.73   60.54    1.307  0.30( 0.30) 0.99   20781.6   11530.00
     10    39141.14   69.23    1.249  0.30( 0.30) 0.99   25765.4   11910.00
     11    41295.11   76.48    1.201  0.30( 0.30) 0.99   30371.6   11330.00
     12    42381.88   82.88    1.158  0.30( 0.30) 0.99   34802.0   11130.00
     13    42283.26   90.46    1.108  0.30( 0.30) 0.99   38792.2   12330.00
     14    42224.50   93.05    1.096  0.30( 0.30) 0.99   40209.2   12410.00
     15    42043.87   97.08    1.078  0.30( 0.30) 0.99   42135.3   12400.00
     16    41529.01  105.71    1.039  0.30( 0.30) 0.99   45502.6   12201.00
     17    41076.19  109.64    1.021  0.30( 0.30) 0.99   46588.9   12111.00
     18    40439.15  114.97    0.997  0.30( 0.30) 0.99   47958.3   12101.10
     19    39919.63  118.95    0.979  0.30( 0.30) 0.99   48809.0   10400.00
     20    38391.25  126.83    0.956  0.30( 0.30) 0.99   50121.1   12010.00
     21    37092.73  132.62    0.941  0.30( 0.30) 0.99   50437.7   10210.00
     22    36730.48  135.23    0.934  0.30( 0.30) 0.99   50546.6   12000.00
     23    33684.69  158.38    0.874  0.30( 0.30) 0.99   51169.7   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   42381.88  Tc(MIN.) =   82.88
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   34801.98

****************************************************************************
  FLOW PROCESS FROM NODE  12721.00 TO NODE  12722.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    256.00  DOWNSTREAM(FEET) =    255.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.42   CHANNEL SLOPE =  0.0012
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.27
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.148
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   42386.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.26
```

AVERAGE FLOW DEPTH(FEET) = 16.27 TRAVEL TIME(MIN.) = 1.49
Tc(MIN.) = 84.38
SUBAREA AREA(ACRES) = 11.24 SUBAREA RUNOFF(CFS) = 8.58
EFFECTIVE AREA(ACRES) = 34813.22 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51180.9 PEAK FLOW RATE(CFS) = 42381.88
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 16.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 16.26 FLOW VELOCITY(FEET/SEC.) = 9.26
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25784.42	23.69	2.206	0.30(0.30)	0.99	5483.4	40500.00
2	26718.97	25.87	2.080	0.30(0.30)	0.99	6271.7	31500.00
3	27275.72	27.19	2.020	0.30(0.30)	0.99	6743.6	40440.00
4	27577.35	28.26	1.971	0.30(0.30)	0.99	7168.4	12710.00
5	28118.38	30.36	1.883	0.30(0.30)	0.99	7969.6	31600.00
6	28535.59	32.06	1.839	0.30(0.30)	0.99	8602.2	31810.00
7	31183.66	43.61	1.556	0.30(0.30)	0.99	13153.2	40100.00
8	33976.06	52.44	1.388	0.30(0.30)	0.99	16497.5	11801.00
9	36832.73	62.10	1.297	0.30(0.30)	0.99	20792.9	11530.00
10	39141.14	70.76	1.239	0.30(0.30)	0.99	25776.7	11910.00
11	41295.11	77.99	1.190	0.30(0.30)	0.99	30382.9	11330.00
12	42381.88	84.38	1.148	0.30(0.30)	0.99	34813.2	11130.00
13	42283.26	91.95	1.101	0.30(0.30)	0.99	38803.4	12330.00
14	42224.50	94.55	1.089	0.30(0.30)	0.99	40220.5	12410.00
15	42043.87	98.58	1.071	0.30(0.30)	0.99	42146.5	12400.00
16	41529.01	107.22	1.032	0.30(0.30)	0.99	45513.9	12201.00
17	41076.19	111.15	1.014	0.30(0.30)	0.99	46600.1	12111.00
18	40439.15	116.48	0.990	0.30(0.30)	0.99	47969.5	12101.10
19	39919.63	120.47	0.973	0.30(0.30)	0.99	48820.2	10400.00
20	38391.25	128.37	0.952	0.30(0.30)	0.99	50132.4	12010.00
21	37092.73	134.18	0.937	0.30(0.30)	0.99	50448.9	10210.00
22	36730.48	136.79	0.930	0.30(0.30)	0.99	50557.8	12000.00
23	33684.69	159.98	0.869	0.30(0.30)	0.99	51180.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 42381.88 Tc(MIN.) = 84.38
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34813.22

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610314Y.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	650.23	35.65	0.30(0.30)	0.99	497.2	31400.00

TOTAL AREA(ACRES) = 497.2

****
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25784.42	23.69	2.206	0.30(0.30)	0.99	5483.4	40500.00
2	26718.97	25.87	2.080	0.30(0.30)	0.99	6271.7	31500.00
3	27275.72	27.19	2.020	0.30(0.30)	0.99	6743.6	40440.00
4	27577.35	28.26	1.971	0.30(0.30)	0.99	7168.4	12710.00
5	28118.38	30.36	1.883	0.30(0.30)	0.99	7969.6	31600.00
6	28535.59	32.06	1.839	0.30(0.30)	0.99	8602.2	31810.00
7	31183.66	43.61	1.556	0.30(0.30)	0.99	13153.2	40100.00
8	33976.06	52.44	1.388	0.30(0.30)	0.99	16497.5	11801.00
9	36832.73	62.10	1.297	0.30(0.30)	0.99	20792.9	11530.00
10	39141.14	70.76	1.239	0.30(0.30)	0.99	25776.7	11910.00
11	41295.11	77.99	1.190	0.30(0.30)	0.99	30382.9	11330.00
12	42381.88	84.38	1.148	0.30(0.30)	0.99	34813.2	11130.00
13	42283.26	91.95	1.101	0.30(0.30)	0.99	38803.4	12330.00
14	42224.50	94.55	1.089	0.30(0.30)	0.99	40220.5	12410.00
15	42043.87	98.58	1.071	0.30(0.30)	0.99	42146.5	12400.00
16	41529.01	107.22	1.032	0.30(0.30)	0.99	45513.9	12201.00
17	41076.19	111.15	1.014	0.30(0.30)	0.99	46600.1	12111.00
18	40439.15	116.48	0.990	0.30(0.30)	0.99	47969.5	12101.10
19	39919.63	120.47	0.973	0.30(0.30)	0.99	48820.2	10400.00
20	38391.25	128.37	0.952	0.30(0.30)	0.99	50132.4	12010.00
21	37092.73	134.18	0.937	0.30(0.30)	0.99	50448.9	10210.00
22	36730.48	136.79	0.930	0.30(0.30)	0.99	50557.8	12000.00
23	33684.69	159.98	0.869	0.30(0.30)	0.99	51180.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	650.23	35.65	1.747	0.30(0.30)	0.99	497.2	31400.00

LONGEST FLOWPATH FROM NODE 31400.00 TO NODE 12722.00 = 14614.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26353.12	23.69	2.206	0.30(0.30)	0.99	5813.8	40500.00
2	27298.86	25.87	2.080	0.30(0.30)	0.99	6632.5	31500.00
3	27864.69	27.19	2.020	0.30(0.30)	0.99	7122.8	40440.00
4	28172.27	28.26	1.971	0.30(0.30)	0.99	7562.5	12710.00
5	28723.84	30.36	1.883	0.30(0.30)	0.99	8393.0	31600.00
6	29157.42	32.06	1.839	0.30(0.30)	0.99	9049.4	31810.00
7	30008.82	35.65	1.747	0.30(0.30)	0.99	10513.8	31400.00
8	31747.91	43.61	1.556	0.30(0.30)	0.99	13650.4	40100.00
9	34465.26	52.44	1.388	0.30(0.30)	0.99	16994.7	11801.00
10	37281.02	62.10	1.297	0.30(0.30)	0.99	21290.1	11530.00
11	39563.45	70.76	1.239	0.30(0.30)	0.99	26273.9	11910.00
12	41695.69	77.99	1.190	0.30(0.30)	0.99	30880.1	11330.00
13	42763.27	84.38	1.148	0.30(0.30)	0.99	35310.4	11130.00
14	42643.79	91.95	1.101	0.30(0.30)	0.99	39300.6	12330.00
15	42579.74	94.55	1.089	0.30(0.30)	0.99	40717.7	12410.00

```
    16    42390.92   98.58    1.071  0.30( 0.30) 0.99   42643.7   12400.00
    17    41858.51  107.22    1.032  0.30( 0.30) 0.99   46011.1   12201.00
    18    41397.70  111.15    1.014  0.30( 0.30) 0.99   47097.3   12111.00
    19    40749.82  116.48    0.990  0.30( 0.30) 0.99   48466.7   12101.10
    20    40222.59  120.47    0.973  0.30( 0.30) 0.99   49317.4   10400.00
    21    38684.95  128.37    0.952  0.30( 0.30) 0.99   50629.5   12010.00
    22    37379.62  134.18    0.937  0.30( 0.30) 0.99   50946.1   10210.00
    23    37014.31  136.79    0.930  0.30( 0.30) 0.99   51055.0   12000.00
    24    33941.30  159.98    0.869  0.30( 0.30) 0.99   51678.1   10100.00
   TOTAL AREA(ACRES) =     51678.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    42763.27  Tc(MIN.) =   84.376
  EFFECTIVE AREA(ACRES) =  35310.41  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    51678.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12722.00 =  109951.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    255.00  DOWNSTREAM(FEET) =    252.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   624.00   CHANNEL SLOPE =  0.0046
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.143
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       62.42      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   42786.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.80
  AVERAGE FLOW DEPTH(FEET) =  11.27   TRAVEL TIME(MIN.) =   0.70
  Tc(MIN.) =   85.08
  SUBAREA AREA(ACRES) =    62.42       SUBAREA RUNOFF(CFS) =   47.36
  EFFECTIVE AREA(ACRES) =  35372.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    51740.6         PEAK FLOW RATE(CFS) =   42763.27
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.27   FLOW VELOCITY(FEET/SEC.) =  14.80
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12740.00 =  110575.24 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1    26353.12   24.51    2.152  0.30( 0.30) 0.99    5876.2   40500.00
      2    27298.86   26.68    2.043  0.30( 0.30) 0.99    6694.9   31500.00
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      3    27864.69   27.99    1.983  0.30( 0.30) 0.99    7185.2   40440.00
      4    28172.27   29.07    1.934  0.30( 0.30) 0.99    7625.0   12710.00
      5    28723.84   31.16    1.862  0.30( 0.30) 0.99    8455.4   31600.00
      6    29157.42   32.86    1.819  0.30( 0.30) 0.99    9111.8   31810.00
      7    30008.82   36.44    1.727  0.30( 0.30) 0.99   10576.2   31400.00
      8    31747.91   44.38    1.538  0.30( 0.30) 0.99   13712.8   40100.00
      9    34465.26   53.19    1.380  0.30( 0.30) 0.99   17057.1   11801.00
     10    37281.02   62.84    1.292  0.30( 0.30) 0.99   21352.5   11530.00
     11    39563.45   71.48    1.234  0.30( 0.30) 0.99   26336.3   11910.00
     12    41695.69   78.70    1.186  0.30( 0.30) 0.99   30942.5   11330.00
     13    42763.27   85.08    1.143  0.30( 0.30) 0.99   35372.8   11130.00
     14    42643.79   92.65    1.098  0.30( 0.30) 0.99   39363.1   12330.00
     15    42579.74   95.25    1.086  0.30( 0.30) 0.99   40780.1   12410.00
     16    42390.92   99.29    1.068  0.30( 0.30) 0.99   42706.1   12400.00
     17    41858.51  107.93    1.029  0.30( 0.30) 0.99   46073.5   12201.00
     18    41397.70  111.86    1.011  0.30( 0.30) 0.99   47159.8   12111.00
     19    40749.82  117.19    0.987  0.30( 0.30) 0.99   48529.1   12101.10
     20    40222.59  121.19    0.971  0.30( 0.30) 0.99   49379.9   10400.00
     21    38684.95  129.10    0.950  0.30( 0.30) 0.99   50692.0   12010.00
     22    37379.62  134.91    0.935  0.30( 0.30) 0.99   51008.5   10210.00
     23    37014.31  137.52    0.928  0.30( 0.30) 0.99   51117.5   12000.00
     24    33941.30  160.74    0.867  0.30( 0.30) 0.99   51740.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   42763.27  Tc(MIN.) =   85.08
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   35372.84

****************************************************************************
  FLOW PROCESS FROM NODE  12722.00 TO NODE  12740.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   85.08
  RAINFALL INTENSITY(INCH/HR) =   1.14
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =   35372.84
  TOTAL STREAM AREA(ACRES) =   51740.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   42763.27

****************************************************************************
  FLOW PROCESS FROM NODE  12730.00 TO NODE  12731.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   561.54
  ELEVATION DATA: UPSTREAM(FEET) =    613.29  DOWNSTREAM(FEET) =    551.75

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.823
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.192
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        6.33      0.30     1.000     0   13.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     16.48
  TOTAL AREA(ACRES) =      6.33   PEAK FLOW RATE(CFS) =     16.48

****************************************************************************
  FLOW PROCESS FROM NODE  12731.00 TO NODE  12732.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    551.75  DOWNSTREAM(FEET) =    494.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   971.91   CHANNEL SLOPE =  0.0590
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.98
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.768
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.62      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.06
  AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   17.02
  SUBAREA AREA(ACRES) =    34.62       SUBAREA RUNOFF(CFS) =   76.90
  EFFECTIVE AREA(ACRES) =     40.95     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.9         PEAK FLOW RATE(CFS) =      90.97
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   5.96
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12732.00 =    1533.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12732.00 TO NODE  12733.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    494.40  DOWNSTREAM(FEET) =    431.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1156.41   CHANNEL SLOPE =  0.0548
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.465
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       59.52      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     149.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.78
  AVERAGE FLOW DEPTH(FEET) =   1.65   TRAVEL TIME(MIN.) =   2.84
  Tc(MIN.) =   19.87
  SUBAREA AREA(ACRES) =    59.52       SUBAREA RUNOFF(CFS) =  115.99
  EFFECTIVE AREA(ACRES) =    100.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      100.5         PEAK FLOW RATE(CFS) =     195.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.92   FLOW VELOCITY(FEET/SEC.) =   7.37
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12733.00 =    2689.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12733.00 TO NODE  12734.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    431.00  DOWNSTREAM(FEET) =    367.11
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1654.48   CHANNEL SLOPE =  0.0386
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.198
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       64.05      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     250.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.99
  AVERAGE FLOW DEPTH(FEET) =   2.42   TRAVEL TIME(MIN.) =   3.94
  Tc(MIN.) =   23.81
  SUBAREA AREA(ACRES) =    64.05       SUBAREA RUNOFF(CFS) =  109.41
  EFFECTIVE AREA(ACRES) =    164.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      164.5         PEAK FLOW RATE(CFS) =     281.04
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.57   FLOW VELOCITY(FEET/SEC.) =   7.23
  LONGEST FLOWPATH FROM NODE  12730.00 TO NODE  12734.00 =    4344.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12734.00 TO NODE  12740.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    367.11  DOWNSTREAM(FEET) =    252.10
```

CHANNEL LENGTH THRU SUBAREA(FEET) = 1880.98 CHANNEL SLOPE = 0.0611
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.37
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.009
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.02	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 301.06
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.69
AVERAGE FLOW DEPTH(FEET) = 2.35 TRAVEL TIME(MIN.) = 3.61
Tc(MIN.) = 27.42
SUBAREA AREA(ACRES) = 26.02 SUBAREA RUNOFF(CFS) = 40.03
EFFECTIVE AREA(ACRES) = 190.54 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 190.5 PEAK FLOW RATE(CFS) = 293.13
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.32 FLOW VELOCITY(FEET/SEC.) = 8.62
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12740.00 = 6225.32 FEET.

****
FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 27.42
RAINFALL INTENSITY(INCH/HR) = 2.01
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 190.54
TOTAL STREAM AREA(ACRES) = 190.54
PEAK FLOW RATE(CFS) AT CONFLUENCE = 293.13

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26353.12	24.51	2.152	0.30(0.30)	0.99	5876.2	40500.00
1	27298.86	26.68	2.043	0.30(0.30)	0.99	6694.9	31500.00
1	27864.69	27.99	1.983	0.30(0.30)	0.99	7185.2	40440.00
1	28172.27	29.07	1.934	0.30(0.30)	0.99	7625.0	12710.00
1	28723.84	31.16	1.862	0.30(0.30)	0.99	8455.4	31600.00
1	29157.42	32.86	1.819	0.30(0.30)	0.99	9111.8	31810.00
1	30008.82	36.44	1.727	0.30(0.30)	0.99	10576.2	31400.00
1	31747.91	44.38	1.538	0.30(0.30)	0.99	13712.8	40100.00
1	34465.26	53.19	1.380	0.30(0.30)	0.99	17057.1	11801.00
1	37281.02	62.84	1.292	0.30(0.30)	0.99	21352.5	11530.00
1	39563.45	71.48	1.234	0.30(0.30)	0.99	26336.3	11910.00
1	41695.69	78.70	1.186	0.30(0.30)	0.99	30942.5	11330.00
1	42763.27	85.08	1.143	0.30(0.30)	0.99	35372.8	11130.00
1	42643.79	92.65	1.098	0.30(0.30)	0.99	39363.1	12330.00
1	42579.74	95.25	1.086	0.30(0.30)	0.99	40780.1	12410.00
1	42390.92	99.29	1.068	0.30(0.30)	0.99	42706.1	12400.00
1	41858.51	107.93	1.029	0.30(0.30)	0.99	46073.5	12201.00
1	41397.70	111.86	1.011	0.30(0.30)	0.99	47159.8	12111.00
1	40749.82	117.19	0.987	0.30(0.30)	0.99	48529.1	12101.10
1	40222.59	121.19	0.971	0.30(0.30)	0.99	49379.9	10400.00
1	38684.95	129.10	0.950	0.30(0.30)	0.99	50692.0	12010.00
1	37379.62	134.91	0.935	0.30(0.30)	0.99	51008.5	10210.00
1	37014.31	137.52	0.928	0.30(0.30)	0.99	51117.5	12000.00
1	33941.30	160.74	0.867	0.30(0.30)	0.99	51740.6	10100.00
2	293.13	27.42	2.009	0.30(0.30)	1.00	190.5	12730.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26636.98	24.51	2.152	0.30(0.30)	0.99	6046.6	40500.00
2	27589.69	26.68	2.043	0.30(0.30)	0.99	6880.3	31500.00
3	27909.11	27.42	2.009	0.30(0.30)	0.99	7160.2	12730.00
4	28153.33	27.99	1.983	0.30(0.30)	0.99	7375.7	40440.00
5	28452.55	29.07	1.934	0.30(0.30)	0.99	7815.5	12710.00
6	28991.76	31.16	1.862	0.30(0.30)	0.99	8646.0	31600.00
7	29417.88	32.86	1.819	0.30(0.30)	0.99	9302.3	31810.00
8	30253.57	36.44	1.727	0.30(0.30)	0.99	10766.8	31400.00
9	31960.27	44.38	1.538	0.30(0.30)	0.99	13903.3	40100.00
10	34650.56	53.19	1.380	0.30(0.30)	0.99	17247.6	11801.00
11	37451.15	62.84	1.292	0.30(0.30)	0.99	21543.0	11530.00
12	39723.64	71.48	1.234	0.30(0.30)	0.99	26526.8	11910.00
13	41847.59	78.70	1.186	0.30(0.30)	0.99	31133.0	11330.00
14	42907.84	85.08	1.143	0.30(0.30)	0.99	35563.4	11130.00
15	42780.64	92.65	1.098	0.30(0.30)	0.99	39553.6	12330.00
16	42714.57	95.25	1.086	0.30(0.30)	0.99	40970.6	12410.00
17	42522.61	99.29	1.068	0.30(0.30)	0.99	42896.7	12400.00
18	41983.49	107.93	1.029	0.30(0.30)	0.99	46264.0	12201.00
19	41519.61	111.86	1.011	0.30(0.30)	0.99	47350.3	12111.00
20	40867.59	117.19	0.987	0.30(0.30)	0.99	48719.7	12101.10
21	40337.65	121.19	0.971	0.30(0.30)	0.99	49570.4	10400.00
22	38796.46	129.10	0.950	0.30(0.30)	0.99	50882.5	12010.00
23	37488.52	134.91	0.935	0.30(0.30)	0.99	51199.1	10210.00
24	37122.04	137.52	0.928	0.30(0.30)	0.99	51308.0	12000.00
25	34038.61	160.74	0.867	0.30(0.30)	0.99	51931.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 42907.84 Tc(MIN.) = 85.08
EFFECTIVE AREA(ACRES) = 35563.38 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51931.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

****
FLOW PROCESS FROM NODE 12740.00 TO NODE 12741.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    252.10  DOWNSTREAM(FEET) =    247.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   401.47   CHANNEL SLOPE =  0.0127
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.50
  CHANNEL FLOW THRU SUBAREA(CFS) =   42907.84
  FLOW VELOCITY(FEET/SEC.) =  20.81   FLOW DEPTH(FEET) =   8.50
  TRAVEL TIME(MIN.) =   0.32   Tc(MIN.) =   85.40
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26636.98   24.89    2.126  0.30( 0.30) 0.99    6046.6   40500.00
      2    27589.69   27.06    2.026  0.30( 0.30) 0.99    6880.3   31500.00
      3    27909.11   27.79    1.992  0.30( 0.30) 0.99    7160.2   12730.00
      4    28153.33   28.36    1.966  0.30( 0.30) 0.99    7375.7   40440.00
      5    28452.55   29.44    1.918  0.30( 0.30) 0.99    7815.5   12710.00
      6    28991.76   31.53    1.853  0.30( 0.30) 0.99    8646.0   31600.00
      7    29417.88   33.22    1.809  0.30( 0.30) 0.99    9302.3   31810.00
      8    30253.57   36.80    1.718  0.30( 0.30) 0.99   10766.8   31400.00
      9    31960.27   44.74    1.530  0.30( 0.30) 0.99   13903.3   40100.00
     10    34650.56   53.53    1.377  0.30( 0.30) 0.99   17247.6   11801.00
     11    37451.15   63.17    1.290  0.30( 0.30) 0.99   21543.0   11530.00
     12    39723.64   71.81    1.232  0.30( 0.30) 0.99   26526.8   11910.00
     13    41847.59   79.02    1.184  0.30( 0.30) 0.99   31133.0   11330.00
     14    42907.84   85.40    1.141  0.30( 0.30) 0.99   35563.4   11130.00
     15    42780.64   92.98    1.097  0.30( 0.30) 0.99   39553.6   12330.00
     16    42714.57   95.58    1.085  0.30( 0.30) 0.99   40970.6   12410.00
     17    42522.61   99.61    1.066  0.30( 0.30) 0.99   42896.7   12400.00
     18    41983.49  108.25    1.027  0.30( 0.30) 0.99   46264.0   12201.00
     19    41519.61  112.19    1.009  0.30( 0.30) 0.99   47350.3   12111.00
     20    40867.59  117.52    0.985  0.30( 0.30) 0.99   48719.7   12101.10
     21    40337.65  121.52    0.970  0.30( 0.30) 0.99   49570.4   10400.00
     22    38796.46  129.43    0.949  0.30( 0.30) 0.99   50882.5   12010.00
     23    37488.52  135.25    0.934  0.30( 0.30) 0.99   51199.1   10210.00
     24    37122.04  137.86    0.927  0.30( 0.30) 0.99   51308.0   12000.00
     25    34038.61  161.09    0.866  0.30( 0.30) 0.99   51931.1   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   42907.84  Tc(MIN.) =   85.40
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   35563.38

********************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE = 15.1
--------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610313Y.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
```



```
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      236.92   22.54  0.30( 0.29) 0.97     132.0   31300.00
    TOTAL AREA(ACRES) =      132.0

********************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12741.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26636.98   24.89    2.126  0.30( 0.30) 0.99    6046.6   40500.00
      2    27589.69   27.06    2.026  0.30( 0.30) 0.99    6880.3   31500.00
      3    27909.11   27.79    1.992  0.30( 0.30) 0.99    7160.2   12730.00
      4    28153.33   28.36    1.966  0.30( 0.30) 0.99    7375.7   40440.00
      5    28452.55   29.44    1.918  0.30( 0.30) 0.99    7815.5   12710.00
      6    28991.76   31.53    1.853  0.30( 0.30) 0.99    8646.0   31600.00
      7    29417.88   33.22    1.809  0.30( 0.30) 0.99    9302.3   31810.00
      8    30253.57   36.80    1.718  0.30( 0.30) 0.99   10766.8   31400.00
      9    31960.27   44.74    1.530  0.30( 0.30) 0.99   13903.3   40100.00
     10    34650.56   53.53    1.377  0.30( 0.30) 0.99   17247.6   11801.00
     11    37451.15   63.17    1.290  0.30( 0.30) 0.99   21543.0   11530.00
     12    39723.64   71.81    1.232  0.30( 0.30) 0.99   26526.8   11910.00
     13    41847.59   79.02    1.184  0.30( 0.30) 0.99   31133.0   11330.00
     14    42907.84   85.40    1.141  0.30( 0.30) 0.99   35563.4   11130.00
     15    42780.64   92.98    1.097  0.30( 0.30) 0.99   39553.6   12330.00
     16    42714.57   95.58    1.085  0.30( 0.30) 0.99   40970.6   12410.00
     17    42522.61   99.61    1.066  0.30( 0.30) 0.99   42896.7   12400.00
     18    41983.49  108.25    1.027  0.30( 0.30) 0.99   46264.0   12201.00
     19    41519.61  112.19    1.009  0.30( 0.30) 0.99   47350.3   12111.00
     20    40867.59  117.52    0.985  0.30( 0.30) 0.99   48719.7   12101.10
     21    40337.65  121.52    0.970  0.30( 0.30) 0.99   49570.4   10400.00
     22    38796.46  129.43    0.949  0.30( 0.30) 0.99   50882.5   12010.00
     23    37488.52  135.25    0.934  0.30( 0.30) 0.99   51199.1   10210.00
     24    37122.04  137.86    0.927  0.30( 0.30) 0.99   51308.0   12000.00
     25    34038.61  161.09    0.866  0.30( 0.30) 0.99   51931.1   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      236.92   22.54    2.282  0.30( 0.29) 0.97     132.0   31300.00
  LONGEST FLOWPATH FROM NODE  31300.00 TO NODE  12741.00 =    5775.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26417.26   22.54    2.282  0.30( 0.30) 0.99    5608.2   31300.00
      2    26855.35   24.89    2.126  0.30( 0.30) 0.99    6178.5   40500.00
      3    27796.07   27.06    2.026  0.30( 0.30) 0.99    7012.3   31500.00
      4    28111.53   27.79    1.992  0.30( 0.30) 0.99    7292.2   12730.00
      5    28352.64   28.36    1.966  0.30( 0.30) 0.99    7507.7   40440.00
      6    28646.07   29.44    1.918  0.30( 0.30) 0.99    7947.5   12710.00
      7    29177.58   31.53    1.853  0.30( 0.30) 0.99    8778.0   31600.00
      8    29598.53   33.22    1.809  0.30( 0.30) 0.99    9434.3   31810.00
```

```
      9    30423.32   36.80    1.718  0.30( 0.30) 0.99   10898.7   31400.00
     10    32107.71   44.74    1.530  0.30( 0.30) 0.99   14035.3   40100.00
     11    34779.73   53.53    1.377  0.30( 0.30) 0.99   17379.6   11801.00
     12    37569.94   63.17    1.290  0.30( 0.30) 0.99   21675.0   11530.00
     13    39835.55   71.81    1.232  0.30( 0.30) 0.99   26658.8   11910.00
     14    41953.75   79.02    1.184  0.30( 0.30) 0.99   31265.0   11330.00
     15    43008.91   85.40    1.141  0.30( 0.30) 0.99   35695.3   11130.00
     16    42876.44   92.98    1.097  0.30( 0.30) 0.99   39685.6   12330.00
     17    42808.97   95.58    1.085  0.30( 0.30) 0.99   41102.6   12410.00
     18    42614.83   99.61    1.066  0.30( 0.30) 0.99   43028.6   12400.00
     19    42071.05  108.25    1.027  0.30( 0.30) 0.99   46396.0   12201.00
     20    41605.04  112.19    1.009  0.30( 0.30) 0.99   47482.3   12111.00
     21    40950.14  117.52    0.985  0.30( 0.30) 0.99   48851.6   12101.10
     22    40418.39  121.52    0.970  0.30( 0.30) 0.99   49702.4   10400.00
     23    38874.74  129.43    0.949  0.30( 0.30) 0.99   51014.5   12010.00
     24    37564.99  135.25    0.934  0.30( 0.30) 0.99   51331.0   10210.00
     25    37197.70  137.86    0.927  0.30( 0.30) 0.99   51440.0   12000.00
     26    34107.03  161.09    0.866  0.30( 0.30) 0.99   52063.1   10100.00
   TOTAL AREA(ACRES) =     52063.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    43008.91  Tc(MIN.) =   85.400
  EFFECTIVE AREA(ACRES) =  35695.35  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    52063.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12741.00 =  110976.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12741.00 TO NODE  12800.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    247.00  DOWNSTREAM(FEET) =    240.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   819.00   CHANNEL SLOPE =  0.0085
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.53
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.136
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       17.31      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   43015.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  18.23
  AVERAGE FLOW DEPTH(FEET) =   9.53   TRAVEL TIME(MIN.) =   0.75
  Tc(MIN.) =   86.15
  SUBAREA AREA(ACRES) =    17.31       SUBAREA RUNOFF(CFS) =   13.02
  EFFECTIVE AREA(ACRES) =  35712.66     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =    52080.4         PEAK FLOW RATE(CFS) =   43008.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.53
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  9.53   FLOW VELOCITY(FEET/SEC.) =  18.23
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26417.26   23.42    2.224  0.30( 0.30) 0.99    5625.6   31300.00
      2    26855.35   25.76    2.084  0.30( 0.30) 0.99    6195.8   40500.00
      3    27796.07   27.92    1.986  0.30( 0.30) 0.99    7029.6   31500.00
      4    28111.53   28.65    1.953  0.30( 0.30) 0.99    7309.5   12730.00
      5    28352.64   29.22    1.927  0.30( 0.30) 0.99    7525.0   40440.00
      6    28646.07   30.29    1.885  0.30( 0.30) 0.99    7964.8   12710.00
      7    29177.58   32.38    1.831  0.30( 0.30) 0.99    8795.3   31600.00
      8    29598.53   34.07    1.788  0.30( 0.30) 0.99    9451.6   31810.00
      9    30423.32   37.64    1.696  0.30( 0.30) 0.99   10916.1   31400.00
     10    32107.71   45.56    1.512  0.30( 0.30) 0.99   14052.6   40100.00
     11    34779.73   54.34    1.369  0.30( 0.30) 0.99   17396.9   11801.00
     12    37569.94   63.95    1.285  0.30( 0.30) 0.99   21692.3   11530.00
     13    39835.55   72.57    1.227  0.30( 0.30) 0.99   26676.1   11910.00
     14    41953.75   79.77    1.179  0.30( 0.30) 0.99   31282.3   11330.00
     15    43008.91   86.15    1.136  0.30( 0.30) 0.99   35712.7   11130.00
     16    42876.44   93.73    1.093  0.30( 0.30) 0.99   39702.9   12330.00
     17    42808.97   96.33    1.081  0.30( 0.30) 0.99   41119.9   12410.00
     18    42614.83  100.36    1.063  0.30( 0.30) 0.99   43045.9   12400.00
     19    42071.05  109.00    1.024  0.30( 0.30) 0.99   46413.3   12201.00
     20    41605.04  112.95    1.006  0.30( 0.30) 0.99   47499.6   12111.00
     21    40950.14  118.28    0.982  0.30( 0.30) 0.99   48868.9   12101.10
     22    40418.39  122.28    0.968  0.30( 0.30) 0.99   49719.7   10400.00
     23    38874.74  130.21    0.947  0.30( 0.30) 0.99   51031.8   12010.00
     24    37564.99  136.03    0.932  0.30( 0.30) 0.99   51348.3   10210.00
     25    37197.70  138.64    0.925  0.30( 0.30) 0.99   51457.3   12000.00
     26    34107.03  161.90    0.864  0.30( 0.30) 0.99   52080.4   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   43008.91  Tc(MIN.) =   86.15
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   35712.66
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    52080.4  TC(MIN.) =     86.15
  EFFECTIVE AREA(ACRES) =  35712.66  AREA-AVERAGED Fm(INCH/HR)=  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.994
  PEAK FLOW RATE(CFS)   =   43008.91

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26417.26   23.42    2.224  0.30( 0.30) 0.99    5625.6   31300.00
      2    26855.35   25.76    2.084  0.30( 0.30) 0.99    6195.8   40500.00
      3    27796.07   27.92    1.986  0.30( 0.30) 0.99    7029.6   31500.00
      4    28111.53   28.65    1.953  0.30( 0.30) 0.99    7309.5   12730.00
      5    28352.64   29.22    1.927  0.30( 0.30) 0.99    7525.0   40440.00
      6    28646.07   30.29    1.885  0.30( 0.30) 0.99    7964.8   12710.00
      7    29177.58   32.38    1.831  0.30( 0.30) 0.99    8795.3   31600.00
      8    29598.53   34.07    1.788  0.30( 0.30) 0.99    9451.6   31810.00
      9    30423.32   37.64    1.696  0.30( 0.30) 0.99   10916.1   31400.00
     10    32107.71   45.56    1.512  0.30( 0.30) 0.99   14052.6   40100.00
     11    34779.73   54.34    1.369  0.30( 0.30) 0.99   17396.9   11801.00
```

12	37569.94	63.95	1.285	0.30(	0.30)	0.99	21692.3	11530.00
13	39835.55	72.57	1.227	0.30(	0.30)	0.99	26676.1	11910.00
14	41953.75	79.77	1.179	0.30(	0.30)	0.99	31282.3	11330.00
15	43008.91	86.15	1.136	0.30(	0.30)	0.99	35712.7	11130.00
16	42876.44	93.73	1.093	0.30(	0.30)	0.99	39702.9	12330.00
17	42808.97	96.33	1.081	0.30(	0.30)	0.99	41119.9	12410.00
18	42614.83	100.36	1.063	0.30(	0.30)	0.99	43045.9	12400.00
19	42071.05	109.00	1.024	0.30(	0.30)	0.99	46413.3	12201.00
20	41605.04	112.95	1.006	0.30(	0.30)	0.99	47499.6	12111.00
21	40950.14	118.28	0.982	0.30(	0.30)	0.99	48868.9	12101.10
22	40418.39	122.28	0.968	0.30(	0.30)	0.99	49719.7	10400.00
23	38874.74	130.21	0.947	0.30(	0.30)	0.99	51031.8	12010.00
24	37564.99	136.03	0.932	0.30(	0.30)	0.99	51348.3	10210.00
25	37197.70	138.64	0.925	0.30(	0.30)	0.99	51457.3	12000.00
26	34107.03	161.90	0.864	0.30(	0.30)	0.99	52080.4	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S28.DAT
  TIME/DATE OF STUDY: 08:14 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.035
   2)   10.00;  3.868
   3)   15.00;  2.984
   4)   20.00;  2.451
   5)   25.00;  2.119
   6)   30.00;  1.892
   7)   40.00;  1.636
   8)   50.00;  1.413
   9)   60.00;  1.311
  10)   90.00;  1.110
  11)  120.00;  0.974
  12)  180.00;  0.817
  13)  360.00;  0.608
  14) 1200.00;  0.267
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610501Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1712.17   25.43  0.30( 0.29) 0.98    1025.4   50120.00
      2     1673.65   26.63  0.30( 0.29) 0.98    1040.0   50150.00
      3     1553.32   30.32  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1712.17   25.43  0.30( 0.29) 0.98    1025.4   50120.00
      2     1673.65   26.63  0.30( 0.29) 0.98    1040.0   50150.00
      3     1553.32   30.32  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =      1063.4
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1063.4  TC(MIN.) =     25.43
  EFFECTIVE AREA(ACRES) =   1025.44  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.981
  PEAK FLOW RATE(CFS)   =    1712.17

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1712.17   25.43    2.099  0.30( 0.29) 0.98    1025.4   50120.00
      2     1673.65   26.63    2.045  0.30( 0.29) 0.98    1040.0   50150.00
      3     1553.32   30.32    1.884  0.30( 0.29) 0.98    1063.4   50100.00
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2013 Advanced Engineering Software (aes)
              Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                               Santa Ana, CA
                                   92707

--------------------------------------------------------------------------
  FILE NAME: S29.DAT
  TIME/DATE OF STUDY: 08:14 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  6.013
   2)   10.00;  3.857
   3)   15.00;  2.977
   4)   20.00;  2.447
   5)   25.00;  2.116
   6)   30.00;  1.889
   7)   40.00;  1.633
   8)   50.00;  1.411
   9)   60.00;  1.308
  10)   90.00;  1.107
  11)  120.00;  0.970
  12)  180.00;  0.814
  13)  360.00;  0.605
  14) 1200.00;  0.265
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S27.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    26855.35   25.76  0.30( 0.30) 0.99    6195.8   40500.00
      2    28646.07   30.29  0.30( 0.30) 0.99    7964.8   12710.00
      3    29598.53   34.07  0.30( 0.30) 0.99    9451.6   31810.00
      4    30423.32   37.64  0.30( 0.30) 0.99   10916.1   31400.00
      5    32107.71   45.56  0.30( 0.30) 0.99   14052.6   40100.00
      6    34779.73   54.34  0.30( 0.30) 0.99   17396.9   11801.00
      7    37569.94   63.95  0.30( 0.30) 0.99   21692.3   11530.00
      8    39835.55   72.57  0.30( 0.30) 0.99   26676.1   11910.00
      9    41953.75   79.77  0.30( 0.30) 0.99   31282.3   11330.00
     10    43008.91   86.15  0.30( 0.30) 0.99   35712.7   11130.00
     11    42876.44   93.73  0.30( 0.30) 0.99   39702.9   12330.00
     12    42614.83  100.36  0.30( 0.30) 0.99   43045.9   12400.00
     13    42071.05  109.00  0.30( 0.30) 0.99   46413.3   12201.00
     14    41605.04  112.95  0.30( 0.30) 0.99   47499.6   12111.00
     15    40950.14  118.28  0.30( 0.30) 0.99   48868.9   12101.10
     16    40418.39  122.28  0.30( 0.30) 0.99   49719.7   10400.00
     17    38874.74  130.21  0.30( 0.30) 0.99   51031.8   12010.00
     18    37564.99  136.03  0.30( 0.30) 0.99   51348.3   10210.00
     19    37197.70  138.64  0.30( 0.30) 0.99   51457.3   12000.00
     20    34107.03  161.90  0.30( 0.30) 0.99   52080.4   10100.00
    TOTAL AREA(ACRES) =    52080.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S28.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1712.17   25.43  0.30( 0.29) 0.98    1025.4   50120.00
      2     1673.65   26.63  0.30( 0.29) 0.98    1040.0   50150.00
      3     1553.32   30.32  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =     1063.4

**************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12800.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1712.17   25.43  0.30( 0.29) 0.98    1025.4   50120.00
      2     1673.65   26.63  0.30( 0.29) 0.98    1040.0   50150.00
      3     1553.32   30.32  0.30( 0.29) 0.98    1063.4   50100.00
    TOTAL AREA(ACRES) =      1063.4
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12740.00 TO NODE  12800.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1712.17   25.43    2.096  0.30( 0.29) 0.98    1025.4   50120.00
      2     1673.65   26.63    2.042  0.30( 0.29) 0.98    1040.0   50150.00
      3     1553.32   30.32    1.881  0.30( 0.29) 0.98    1063.4   50100.00
  LONGEST FLOWPATH FROM NODE  50150.00 TO NODE  12800.00 =   11349.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    26855.35   25.76    2.081  0.30( 0.30) 0.99    6195.8   40500.00
      2    28646.07   30.29    1.882  0.30( 0.30) 0.99    7964.8   12710.00
      3    29598.53   34.07    1.785  0.30( 0.30) 0.99    9451.6   31810.00
      4    30423.32   37.64    1.693  0.30( 0.30) 0.99   10916.1   31400.00
      5    32107.71   45.56    1.510  0.30( 0.30) 0.99   14052.6   40100.00
      6    34779.73   54.34    1.366  0.30( 0.30) 0.99   17396.9   11801.00
      7    37569.94   63.95    1.282  0.30( 0.30) 0.99   21692.3   11530.00
      8    39835.55   72.57    1.224  0.30( 0.30) 0.99   26676.1   11910.00
      9    41953.75   79.77    1.176  0.30( 0.30) 0.99   31282.3   11330.00
     10    43008.91   86.15    1.133  0.30( 0.30) 0.99   35712.7   11130.00
     11    42876.44   93.73    1.090  0.30( 0.30) 0.99   39702.9   12330.00
     12    42614.83  100.36    1.060  0.30( 0.30) 0.99   43045.9   12400.00
     13    42071.05  109.00    1.020  0.30( 0.30) 0.99   46413.3   12201.00
     14    41605.04  112.95    1.002  0.30( 0.30) 0.99   47499.6   12111.00
     15    40950.14  118.28    0.978  0.30( 0.30) 0.99   48868.9   12101.10
     16    40418.39  122.28    0.964  0.30( 0.30) 0.99   49719.7   10400.00
     17    38874.74  130.21    0.943  0.30( 0.30) 0.99   51031.8   12010.00
     18    37564.99  136.03    0.928  0.30( 0.30) 0.99   51348.3   10210.00
     19    37197.70  138.64    0.922  0.30( 0.30) 0.99   51457.3   12000.00
     20    34107.03  161.90    0.861  0.30( 0.30) 0.99   52080.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    28445.49   25.43    2.096  0.30( 0.30) 0.99    7141.5   50120.00
      2    28556.84   25.76    2.081  0.30( 0.30) 0.99    7225.3   40500.00
      3    28871.10   26.63    2.042  0.30( 0.30) 0.99    7573.8   50150.00
      4    30200.17   30.29    1.882  0.30( 0.30) 0.99    9028.0   12710.00
      5    30205.39   30.32    1.881  0.30( 0.30) 0.99    9037.5   50100.00
      6    31057.73   34.07    1.785  0.30( 0.30) 0.99   10515.0   31810.00
      7    31793.06   37.64    1.693  0.30( 0.30) 0.99   11979.4   31400.00
      8    33297.43   45.56    1.510  0.30( 0.30) 0.99   15116.0   40100.00
      9    35829.21   54.34    1.366  0.30( 0.30) 0.99   18460.3   11801.00
     10    38536.38   63.95    1.282  0.30( 0.30) 0.99   22755.7   11530.00
     11    40745.45   72.57    1.224  0.30( 0.30) 0.99   27739.5   11910.00
     12    42816.41   79.77    1.176  0.30( 0.30) 0.99   32345.7   11330.00
     13    43829.75   86.15    1.133  0.30( 0.30) 0.99   36776.0   11130.00
     14    43655.36   93.73    1.090  0.30( 0.30) 0.99   40766.3   12330.00
     15    43364.08  100.36    1.060  0.30( 0.30) 0.99   44109.3   12400.00
```



```
     16    42781.65  109.00    1.020  0.30( 0.30) 0.99   47476.7   12201.00
     17    42298.02  112.95    1.002  0.30( 0.30) 0.99   48563.0   12111.00
     18    41619.26  118.28    0.978  0.30( 0.30) 0.99   49932.3   12101.10
     19    41074.02  122.28    0.964  0.30( 0.30) 0.99   50783.1   10400.00
     20    39510.20  130.21    0.943  0.30( 0.30) 0.99   52095.2   12010.00
     21    38185.61  136.03    0.928  0.30( 0.30) 0.99   52411.7   10210.00
     22    37811.67  138.64    0.922  0.30( 0.30) 0.99   52520.7   12000.00
     23    34661.81  161.90    0.861  0.30( 0.30) 0.99   53143.8   10100.00
   TOTAL AREA(ACRES) =     53143.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    43829.75  Tc(MIN.) =   86.148
  EFFECTIVE AREA(ACRES) =  36776.04  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53143.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12800.00 =  111795.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12800.00 TO NODE  12801.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.00  DOWNSTREAM(FEET) =    234.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.96   CHANNEL SLOPE =  0.0054
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.96
  CHANNEL FLOW THRU SUBAREA(CFS) =   43829.75
  FLOW VELOCITY(FEET/SEC.) =  15.70   FLOW DEPTH(FEET) =  10.96
  TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =   87.33
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    28445.49   26.79    2.035  0.30( 0.30) 0.99    7141.5   50120.00
      2    28556.84   27.12    2.020  0.30( 0.30) 0.99    7225.3   40500.00
      3    28871.10   27.98    1.981  0.30( 0.30) 0.99    7573.8   50150.00
      4    30200.17   31.62    1.847  0.30( 0.30) 0.99    9028.0   12710.00
      5    30205.39   31.65    1.847  0.30( 0.30) 0.99    9037.5   50100.00
      6    31057.73   35.39    1.751  0.30( 0.30) 0.99   10515.0   31810.00
      7    31793.06   38.95    1.660  0.30( 0.30) 0.99   11979.4   31400.00
      8    33297.43   46.85    1.481  0.30( 0.30) 0.99   15116.0   40100.00
      9    35829.21   55.60    1.353  0.30( 0.30) 0.99   18460.3   11801.00
     10    38536.38   65.18    1.273  0.30( 0.30) 0.99   22755.7   11530.00
     11    40745.45   73.78    1.216  0.30( 0.30) 0.99   27739.5   11910.00
     12    42816.41   80.96    1.168  0.30( 0.30) 0.99   32345.7   11330.00
     13    43829.75   87.33    1.125  0.30( 0.30) 0.99   36776.0   11130.00
     14    43655.36   94.91    1.085  0.30( 0.30) 0.99   40766.3   12330.00
     15    43364.08  101.54    1.054  0.30( 0.30) 0.99   44109.3   12400.00
     16    42781.65  110.19    1.015  0.30( 0.30) 0.99   47476.7   12201.00
     17    42298.02  114.14    0.997  0.30( 0.30) 0.99   48563.0   12111.00
     18    41619.26  119.48    0.972  0.30( 0.30) 0.99   49932.3   12101.10
     19    41074.02  123.49    0.961  0.30( 0.30) 0.99   50783.1   10400.00
     20    39510.20  131.43    0.940  0.30( 0.30) 0.99   52095.2   12010.00
     21    38185.61  137.27    0.925  0.30( 0.30) 0.99   52411.7   10210.00
     22    37811.67  139.88    0.918  0.30( 0.30) 0.99   52520.7   12000.00
```

```
    23    34661.81  163.17    0.858  0.30( 0.30) 0.99   53143.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   43829.75  Tc(MIN.) =   87.33
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   36776.04

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610502Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       89.50   10.73  0.30( 0.28) 0.94      28.9   50200.00
    TOTAL AREA(ACRES) =       28.9

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12801.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    28445.49   26.79    2.035  0.30( 0.30) 0.99    7141.5   50120.00
      2    28556.84   27.12    2.020  0.30( 0.30) 0.99    7225.3   40500.00
      3    28871.10   27.98    1.981  0.30( 0.30) 0.99    7573.8   50150.00
      4    30200.17   31.62    1.847  0.30( 0.30) 0.99    9028.0   12710.00
      5    30205.39   31.65    1.847  0.30( 0.30) 0.99    9037.5   50100.00
      6    31057.73   35.39    1.751  0.30( 0.30) 0.99   10515.0   31810.00
      7    31793.06   38.95    1.660  0.30( 0.30) 0.99   11979.4   31400.00
      8    33297.43   46.85    1.481  0.30( 0.30) 0.99   15116.0   40100.00
      9    35829.21   55.60    1.353  0.30( 0.30) 0.99   18460.3   11801.00
     10    38536.38   65.18    1.273  0.30( 0.30) 0.99   22755.7   11530.00
     11    40745.45   73.78    1.216  0.30( 0.30) 0.99   27739.5   11910.00
     12    42816.41   80.96    1.168  0.30( 0.30) 0.99   32345.7   11330.00
     13    43829.75   87.33    1.125  0.30( 0.30) 0.99   36776.0   11130.00
     14    43655.36   94.91    1.085  0.30( 0.30) 0.99   40766.3   12330.00
     15    43364.08  101.54    1.054  0.30( 0.30) 0.99   44109.3   12400.00
     16    42781.65  110.19    1.015  0.30( 0.30) 0.99   47476.7   12201.00
     17    42298.02  114.14    0.997  0.30( 0.30) 0.99   48563.0   12111.00
     18    41619.26  119.48    0.972  0.30( 0.30) 0.99   49932.3   12101.10
     19    41074.02  123.49    0.961  0.30( 0.30) 0.99   50783.1   10400.00
     20    39510.20  131.43    0.940  0.30( 0.30) 0.99   52095.2   12010.00
     21    38185.61  137.27    0.925  0.30( 0.30) 0.99   52411.7   10210.00
     22    37811.67  139.88    0.918  0.30( 0.30) 0.99   52520.7   12000.00
     23    34661.81  163.17    0.858  0.30( 0.30) 0.99   53143.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.
```



```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       89.50   10.73    3.728  0.30( 0.28) 0.94      28.9   50200.00
  LONGEST FLOWPATH FROM NODE  50200.00 TO NODE  12801.00 =    1426.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    22588.72   10.73    3.728  0.30( 0.30) 0.99    2890.1   50200.00
      2    28491.03   26.79    2.035  0.30( 0.30) 0.99    7170.4   50120.00
      3    28601.99   27.12    2.020  0.30( 0.30) 0.99    7254.2   40500.00
      4    28915.23   27.98    1.981  0.30( 0.30) 0.99    7602.6   50150.00
      5    30240.85   31.62    1.847  0.30( 0.30) 0.99    9056.9   12710.00
      6    30246.05   31.65    1.847  0.30( 0.30) 0.99    9066.4   50100.00
      7    31095.91   35.39    1.751  0.30( 0.30) 0.99   10543.9   31810.00
      8    31828.87   38.95    1.660  0.30( 0.30) 0.99   12008.3   31400.00
      9    33328.59   46.85    1.481  0.30( 0.30) 0.99   15144.8   40100.00
     10    35857.06   55.60    1.353  0.30( 0.30) 0.99   18489.2   11801.00
     11    38562.15   65.18    1.273  0.30( 0.30) 0.99   22784.6   11530.00
     12    40769.72   73.78    1.216  0.30( 0.30) 0.99   27768.4   11910.00
     13    42839.43   80.96    1.168  0.30( 0.30) 0.99   32374.6   11330.00
     14    43851.66   87.33    1.125  0.30( 0.30) 0.99   36804.9   11130.00
     15    43676.23   94.91    1.085  0.30( 0.30) 0.99   40795.1   12330.00
     16    43384.16  101.54    1.054  0.30( 0.30) 0.99   44138.2   12400.00
     17    42800.71  110.19    1.015  0.30( 0.30) 0.99   47505.6   12201.00
     18    42316.61  114.14    0.997  0.30( 0.30) 0.99   48591.8   12111.00
     19    41637.21  119.48    0.972  0.30( 0.30) 0.99   49961.2   12101.10
     20    41091.68  123.49    0.961  0.30( 0.30) 0.99   50811.9   10400.00
     21    39527.32  131.43    0.940  0.30( 0.30) 0.99   52124.0   12010.00
     22    38202.34  137.27    0.925  0.30( 0.30) 0.99   52440.6   10210.00
     23    37828.22  139.88    0.918  0.30( 0.30) 0.99   52549.5   12000.00
     24    34676.79  163.17    0.858  0.30( 0.30) 0.99   53172.6   10100.00
    TOTAL AREA(ACRES) =     53172.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    43851.66  Tc(MIN.) =   87.328
  EFFECTIVE AREA(ACRES) =  36804.91  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =    53172.6
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12801.00 =  112906.67 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  12801.00 TO NODE  12901.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    234.00  DOWNSTREAM(FEET) =    216.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2009.32   CHANNEL SLOPE =  0.0090
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.51
  CHANNEL FLOW THRU SUBAREA(CFS) =   43851.66
  FLOW VELOCITY(FEET/SEC.) =  18.63   FLOW DEPTH(FEET) =   9.51
  TRAVEL TIME(MIN.) =   1.80   Tc(MIN.) =   89.13
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  12901.00 =  114915.99 FEET.
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22588.72	12.98	3.333	0.30(0.30)	0.99	2890.1	50200.00
2	28491.03	28.86	1.941	0.30(0.30)	0.99	7170.4	50120.00
3	28601.99	29.19	1.926	0.30(0.30)	0.99	7254.2	40500.00
4	28915.23	30.04	1.888	0.30(0.30)	0.99	7602.6	50150.00
5	30240.85	33.66	1.795	0.30(0.30)	0.99	9056.9	12710.00
6	30246.05	33.68	1.795	0.30(0.30)	0.99	9066.4	50100.00
7	31095.91	37.40	1.700	0.30(0.30)	0.99	10543.9	31810.00
8	31828.87	40.95	1.612	0.30(0.30)	0.99	12008.3	31400.00
9	33328.59	48.82	1.437	0.30(0.30)	0.99	15144.8	40100.00
10	35857.06	57.52	1.334	0.30(0.30)	0.99	18489.2	11801.00
11	38562.15	67.06	1.261	0.30(0.30)	0.99	22784.6	11530.00
12	40769.72	75.62	1.203	0.30(0.30)	0.99	27768.4	11910.00
13	42839.43	82.77	1.155	0.30(0.30)	0.99	32374.6	11330.00
14	43851.66	89.13	1.113	0.30(0.30)	0.99	36804.9	11130.00
15	43676.23	96.71	1.076	0.30(0.30)	0.99	40795.1	12330.00
16	43384.16	103.35	1.046	0.30(0.30)	0.99	44138.2	12400.00
17	42800.71	112.00	1.007	0.30(0.30)	0.99	47505.6	12201.00
18	42316.61	115.96	0.988	0.30(0.30)	0.99	48591.8	12111.00
19	41637.21	121.31	0.967	0.30(0.30)	0.99	49961.2	12101.10
20	41091.68	125.32	0.956	0.30(0.30)	0.99	50811.9	10400.00
21	39527.32	133.28	0.935	0.30(0.30)	0.99	52124.0	12010.00
22	38202.34	139.15	0.920	0.30(0.30)	0.99	52440.6	10210.00
23	37828.22	141.77	0.913	0.30(0.30)	0.99	52549.5	12000.00
24	34676.79	165.11	0.853	0.30(0.30)	0.99	53172.6	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 43851.66 Tc(MIN.) = 89.13
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 36804.91

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610312Y.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	562.17	29.63	0.30(0.29)	0.96	385.8	31200.00

TOTAL AREA(ACRES) = 385.8

****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22588.72	12.98	3.333	0.30(0.30)	0.99	2890.1	50200.00
2	28491.03	28.86	1.941	0.30(0.30)	0.99	7170.4	50120.00
3	28601.99	29.19	1.926	0.30(0.30)	0.99	7254.2	40500.00
4	28915.23	30.04	1.888	0.30(0.30)	0.99	7602.6	50150.00
5	30240.85	33.66	1.795	0.30(0.30)	0.99	9056.9	12710.00

6	30246.05	33.68	1.795	0.30(0.30)	0.99	9066.4	50100.00
7	31095.91	37.40	1.700	0.30(0.30)	0.99	10543.9	31810.00
8	31828.87	40.95	1.612	0.30(0.30)	0.99	12008.3	31400.00
9	33328.59	48.82	1.437	0.30(0.30)	0.99	15144.8	40100.00
10	35857.06	57.52	1.334	0.30(0.30)	0.99	18489.2	11801.00
11	38562.15	67.06	1.261	0.30(0.30)	0.99	22784.6	11530.00
12	40769.72	75.62	1.203	0.30(0.30)	0.99	27768.4	11910.00
13	42839.43	82.77	1.155	0.30(0.30)	0.99	32374.6	11330.00
14	43851.66	89.13	1.113	0.30(0.30)	0.99	36804.9	11130.00
15	43676.23	96.71	1.076	0.30(0.30)	0.99	40795.1	12330.00
16	43384.16	103.35	1.046	0.30(0.30)	0.99	44138.2	12400.00
17	42800.71	112.00	1.007	0.30(0.30)	0.99	47505.6	12201.00
18	42316.61	115.96	0.988	0.30(0.30)	0.99	48591.8	12111.00
19	41637.21	121.31	0.967	0.30(0.30)	0.99	49961.2	12101.10
20	41091.68	125.32	0.956	0.30(0.30)	0.99	50811.9	10400.00
21	39527.32	133.28	0.935	0.30(0.30)	0.99	52124.0	12010.00
22	38202.34	139.15	0.920	0.30(0.30)	0.99	52440.6	10210.00
23	37828.22	141.77	0.913	0.30(0.30)	0.99	52549.5	12000.00
24	34676.79	165.11	0.853	0.30(0.30)	0.99	53172.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	562.17	29.63	1.906	0.30(0.29)	0.96	385.8	31200.00

LONGEST FLOWPATH FROM NODE 31200.00 TO NODE 12901.00 = 11169.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23051.94	12.98	3.333	0.30(0.30)	0.99	3059.0	50200.00
2	29050.43	28.86	1.941	0.30(0.30)	0.99	7546.2	50120.00
3	29162.65	29.19	1.926	0.30(0.30)	0.99	7634.3	40500.00
4	29324.67	29.63	1.906	0.30(0.30)	0.99	7818.5	31200.00
5	29471.14	30.04	1.888	0.30(0.30)	0.99	7988.4	50150.00
6	30764.65	33.66	1.795	0.30(0.30)	0.99	9442.7	12710.00
7	30769.65	33.68	1.795	0.30(0.30)	0.99	9452.2	50100.00
8	31586.41	37.40	1.700	0.30(0.30)	0.99	10929.6	31810.00
9	32288.99	40.95	1.612	0.30(0.30)	0.99	12394.1	31400.00
10	33728.06	48.82	1.437	0.30(0.30)	0.99	15530.6	40100.00
11	36220.54	57.52	1.334	0.30(0.30)	0.99	18874.9	11801.00
12	38900.33	67.06	1.261	0.30(0.30)	0.99	23170.3	11530.00
13	41087.98	75.62	1.203	0.30(0.30)	0.99	28154.1	11910.00
14	43141.06	82.77	1.155	0.30(0.30)	0.99	32760.3	11330.00
15	44138.52	89.13	1.113	0.30(0.30)	0.99	37190.7	11130.00
16	43950.42	96.71	1.076	0.30(0.30)	0.99	41180.9	12330.00
17	43647.83	103.35	1.046	0.30(0.30)	0.99	44524.0	12400.00
18	43050.65	112.00	1.007	0.30(0.30)	0.99	47891.3	12201.00
19	42560.29	115.96	0.988	0.30(0.30)	0.99	48977.6	12111.00
20	41873.30	121.31	0.967	0.30(0.30)	0.99	50347.0	12101.10
21	41324.14	125.32	0.956	0.30(0.30)	0.99	51197.7	10400.00
22	39752.59	133.28	0.935	0.30(0.30)	0.99	52509.8	12010.00
23	38422.32	139.15	0.920	0.30(0.30)	0.99	52826.4	10210.00
24	38045.84	141.77	0.913	0.30(0.30)	0.99	52935.3	12000.00
25	34873.35	165.11	0.853	0.30(0.30)	0.99	53558.4	10100.00

TOTAL AREA(ACRES) = 53558.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 44138.52 Tc(MIN.) = 89.125
EFFECTIVE AREA(ACRES) = 37190.69 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53558.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

```
****************************************************************************
```
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 12
```
----------------------------------------------------------------------------
```
>>>>>CLEAR MEMORY BANK # 3 <<<<<
```
============================================================================
```

****
```
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1
```

```
>>>>>DEFINE MEMORY BANK # 3 <<<<<
```
==
PEAK FLOWRATE TABLE FILE NAME: 0610503Y.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	637.49	23.23	0.30(0.30)	0.99	366.1	50300.00

TOTAL AREA(ACRES) = 366.1

```
****************************************************************************
```
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11
```
----------------------------------------------------------------------------
```
>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
```
============================================================================
```

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23051.94	12.98	3.333	0.30(0.30)	0.99	3059.0	50200.00
2	29050.43	28.86	1.941	0.30(0.30)	0.99	7546.2	50120.00
3	29162.65	29.19	1.926	0.30(0.30)	0.99	7634.3	40500.00
4	29324.67	29.63	1.906	0.30(0.30)	0.99	7818.5	31200.00
5	29471.14	30.04	1.888	0.30(0.30)	0.99	7988.4	50150.00
6	30764.65	33.66	1.795	0.30(0.30)	0.99	9442.7	12710.00
7	30769.65	33.68	1.795	0.30(0.30)	0.99	9452.2	50100.00
8	31586.41	37.40	1.700	0.30(0.30)	0.99	10929.6	31810.00
9	32288.99	40.95	1.612	0.30(0.30)	0.99	12394.1	31400.00
10	33728.06	48.82	1.437	0.30(0.30)	0.99	15530.6	40100.00
11	36220.54	57.52	1.334	0.30(0.30)	0.99	18874.9	11801.00
12	38900.33	67.06	1.261	0.30(0.30)	0.99	23170.3	11530.00
13	41087.98	75.62	1.203	0.30(0.30)	0.99	28154.1	11910.00
14	43141.06	82.77	1.155	0.30(0.30)	0.99	32760.3	11330.00
15	44138.52	89.13	1.113	0.30(0.30)	0.99	37190.7	11130.00
16	43950.42	96.71	1.076	0.30(0.30)	0.99	41180.9	12330.00
17	43647.83	103.35	1.046	0.30(0.30)	0.99	44524.0	12400.00
18	43050.65	112.00	1.007	0.30(0.30)	0.99	47891.3	12201.00
19	42560.29	115.96	0.988	0.30(0.30)	0.99	48977.6	12111.00
20	41873.30	121.31	0.967	0.30(0.30)	0.99	50347.0	12101.10
21	41324.14	125.32	0.956	0.30(0.30)	0.99	51197.7	10400.00
22	39752.59	133.28	0.935	0.30(0.30)	0.99	52509.8	12010.00
23	38422.32	139.15	0.920	0.30(0.30)	0.99	52826.4	10210.00
24	38045.84	141.77	0.913	0.30(0.30)	0.99	52935.3	12000.00
25	34873.35	165.11	0.853	0.30(0.30)	0.99	53558.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	637.49	23.23	2.233	0.30(0.30)	0.99	366.1	50300.00

LONGEST FLOWPATH FROM NODE 50300.00 TO NODE 12901.00 = 8614.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23610.42	12.98	3.333	0.30(0.30)	0.99	3263.6	50200.00
2	27559.87	23.23	2.233	0.30(0.30)	0.99	6320.4	50300.00
3	29591.50	28.86	1.941	0.30(0.30)	0.99	7912.3	50120.00
4	29698.84	29.19	1.926	0.30(0.30)	0.99	8000.4	40500.00
5	29854.32	29.63	1.906	0.30(0.30)	0.99	8184.6	31200.00
6	29994.84	30.04	1.888	0.30(0.30)	0.99	8354.5	50150.00
7	31257.90	33.66	1.795	0.30(0.30)	0.99	9808.8	12710.00
8	31262.71	33.68	1.795	0.30(0.30)	0.99	9818.3	50100.00
9	32048.08	37.40	1.700	0.30(0.30)	0.99	11295.8	31810.00
10	32721.84	40.95	1.612	0.30(0.30)	0.99	12760.2	31400.00
11	34103.38	48.82	1.437	0.30(0.30)	0.99	15896.7	40100.00
12	36561.71	57.52	1.334	0.30(0.30)	0.99	19241.0	11801.00
13	39217.50	67.06	1.261	0.30(0.30)	0.99	23536.5	11530.00
14	41386.26	75.62	1.203	0.30(0.30)	0.99	28520.3	11910.00
15	43423.56	82.77	1.155	0.30(0.30)	0.99	33126.4	11330.00
16	44407.00	89.13	1.113	0.30(0.30)	0.99	37556.8	11130.00
17	44206.89	96.71	1.076	0.30(0.30)	0.99	41547.0	12330.00
18	43894.31	103.35	1.046	0.30(0.30)	0.99	44890.1	12400.00
19	43284.12	112.00	1.007	0.30(0.30)	0.99	48257.4	12201.00
20	42787.81	115.96	0.988	0.30(0.30)	0.99	49343.7	12111.00
21	42093.62	121.31	0.967	0.30(0.30)	0.99	50713.1	12101.10
22	41541.03	125.32	0.956	0.30(0.30)	0.99	51563.8	10400.00
23	39962.66	133.28	0.935	0.30(0.30)	0.99	52875.9	12010.00
24	38627.37	139.15	0.920	0.30(0.30)	0.99	53192.5	10210.00
25	38248.64	141.77	0.913	0.30(0.30)	0.99	53301.4	12000.00
26	35056.16	165.11	0.853	0.30(0.30)	0.99	53924.5	10100.00

TOTAL AREA(ACRES) = 53924.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 44407.00 Tc(MIN.) = 89.125
EFFECTIVE AREA(ACRES) = 37556.80 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53924.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

```
****************************************************************************
```
FLOW PROCESS FROM NODE 12901.00 TO NODE 12902.00 IS CODE = 56
```
----------------------------------------------------------------------------
```
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
```
============================================================================
ELEVATION DATA: UPSTREAM(FEET) = 216.00 DOWNSTREAM(FEET) = 215.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 122.04 CHANNEL SLOPE = 0.0082
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.82
CHANNEL FLOW THRU SUBAREA(CFS) = 44407.00
```

FLOW VELOCITY(FEET/SEC.) = 18.16 FLOW DEPTH(FEET) = 9.82
TRAVEL TIME(MIN.) = 0.11 Tc(MIN.) = 89.24
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12902.00 = 115038.03 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23610.42	13.11	3.309	0.30(0.30)	0.99	3263.6	50200.00
2	27559.87	23.36	2.225	0.30(0.30)	0.99	6320.4	50300.00
3	29591.50	28.99	1.935	0.30(0.30)	0.99	7912.3	50120.00
4	29698.84	29.32	1.920	0.30(0.30)	0.99	8000.4	40500.00
5	29854.32	29.75	1.900	0.30(0.30)	0.99	8184.6	31200.00
6	29994.84	30.17	1.885	0.30(0.30)	0.99	8354.5	50150.00
7	31257.90	33.78	1.792	0.30(0.30)	0.99	9808.8	12710.00
8	31262.71	33.80	1.792	0.30(0.30)	0.99	9818.3	50100.00
9	32048.08	37.53	1.696	0.30(0.30)	0.99	11295.8	31810.00
10	32721.84	41.07	1.609	0.30(0.30)	0.99	12760.2	31400.00
11	34103.38	48.94	1.435	0.30(0.30)	0.99	15896.7	40100.00
12	36561.71	57.64	1.332	0.30(0.30)	0.99	19241.0	11801.00
13	39217.50	67.17	1.260	0.30(0.30)	0.99	23536.5	11530.00
14	41386.26	75.74	1.203	0.30(0.30)	0.99	28520.3	11910.00
15	43423.56	82.89	1.155	0.30(0.30)	0.99	33126.4	11330.00
16	44407.00	89.24	1.112	0.30(0.30)	0.99	37556.8	11130.00
17	44206.89	96.82	1.076	0.30(0.30)	0.99	41547.0	12330.00
18	43894.31	103.46	1.046	0.30(0.30)	0.99	44890.1	12400.00
19	43284.12	112.12	1.006	0.30(0.30)	0.99	48257.4	12201.00
20	42787.81	116.07	0.988	0.30(0.30)	0.99	49343.7	12111.00
21	42093.62	121.42	0.966	0.30(0.30)	0.99	50713.1	12101.10
22	41541.03	125.44	0.956	0.30(0.30)	0.99	51563.8	10400.00
23	39962.66	133.40	0.935	0.30(0.30)	0.99	52875.9	12010.00
24	38627.37	139.26	0.920	0.30(0.30)	0.99	53192.5	10210.00
25	38248.64	141.88	0.913	0.30(0.30)	0.99	53301.4	12000.00
26	35056.16	165.23	0.852	0.30(0.30)	0.99	53924.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 44407.00 Tc(MIN.) = 89.24
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37556.80

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12902.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
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****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 215.00 DOWNSTREAM(FEET) = 214.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 895.53 CHANNEL SLOPE = 0.0011
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 17.02
CHANNEL FLOW THRU SUBAREA(CFS) = 44407.00
FLOW VELOCITY(FEET/SEC.) = 9.15 FLOW DEPTH(FEET) = 17.02
TRAVEL TIME(MIN.) = 1.63 Tc(MIN.) = 90.87

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23610.42	15.09	2.967	0.30(0.30)	0.99	3263.6	50200.00
2	27559.87	25.24	2.105	0.30(0.30)	0.99	6320.4	50300.00
3	29591.50	30.84	1.868	0.30(0.30)	0.99	7912.3	50120.00
4	29698.84	31.16	1.859	0.30(0.30)	0.99	8000.4	40500.00
5	29854.32	31.60	1.848	0.30(0.30)	0.99	8184.6	31200.00
6	29994.84	32.01	1.838	0.30(0.30)	0.99	8354.5	50150.00
7	31257.90	35.60	1.746	0.30(0.30)	0.99	9808.8	12710.00
8	31262.71	35.62	1.745	0.30(0.30)	0.99	9818.3	50100.00
9	32048.08	39.33	1.650	0.30(0.30)	0.99	11295.8	31810.00
10	32721.84	42.86	1.570	0.30(0.30)	0.99	12760.2	31400.00
11	34103.38	50.71	1.404	0.30(0.30)	0.99	15896.7	40100.00
12	36561.71	59.37	1.315	0.30(0.30)	0.99	19241.0	11801.00
13	39217.50	68.87	1.249	0.30(0.30)	0.99	23536.5	11530.00
14	41386.26	77.40	1.191	0.30(0.30)	0.99	28520.3	11910.00
15	43423.56	84.53	1.144	0.30(0.30)	0.99	33126.4	11330.00
16	44407.00	90.87	1.103	0.30(0.30)	0.99	37556.8	11130.00
17	44206.89	98.45	1.068	0.30(0.30)	0.99	41547.0	12330.00
18	43894.31	105.10	1.038	0.30(0.30)	0.99	44890.1	12400.00
19	43284.12	113.76	0.998	0.30(0.30)	0.99	48257.4	12201.00
20	42787.81	117.72	0.980	0.30(0.30)	0.99	49343.7	12111.00
21	42093.62	123.08	0.962	0.30(0.30)	0.99	50713.1	12101.10
22	41541.03	127.10	0.952	0.30(0.30)	0.99	51563.8	10400.00
23	39962.66	135.08	0.931	0.30(0.30)	0.99	52875.9	12010.00
24	38627.37	140.96	0.915	0.30(0.30)	0.99	53192.5	10210.00
25	38248.64	143.59	0.909	0.30(0.30)	0.99	53301.4	12000.00
26	35056.16	166.98	0.848	0.30(0.30)	0.99	53924.5	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 44407.00 Tc(MIN.) = 90.87
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37556.80

****
FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
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****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610504Y.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	161.41	16.37	0.30(0.29)	0.97	70.7	50400.00

TOTAL AREA(ACRES) = 70.7

****
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23610.42	15.09	2.967	0.30(0.30)	0.99	3263.6	50200.00
2	27559.87	25.24	2.105	0.30(0.30)	0.99	6320.4	50300.00
3	29591.50	30.84	1.868	0.30(0.30)	0.99	7912.3	50120.00
4	29698.84	31.16	1.859	0.30(0.30)	0.99	8000.4	40500.00
5	29854.32	31.60	1.848	0.30(0.30)	0.99	8184.6	31200.00
6	29994.84	32.01	1.838	0.30(0.30)	0.99	8354.5	50150.00
7	31257.90	35.60	1.746	0.30(0.30)	0.99	9808.8	12710.00
8	31262.71	35.62	1.745	0.30(0.30)	0.99	9818.3	50100.00
9	32048.08	39.33	1.650	0.30(0.30)	0.99	11295.8	31810.00
10	32721.84	42.86	1.570	0.30(0.30)	0.99	12760.2	31400.00
11	34103.38	50.71	1.404	0.30(0.30)	0.99	15896.7	40100.00
12	36561.71	59.37	1.315	0.30(0.30)	0.99	19241.0	11801.00
13	39217.50	68.87	1.249	0.30(0.30)	0.99	23536.5	11530.00
14	41386.26	77.40	1.191	0.30(0.30)	0.99	28520.3	11910.00
15	43423.56	84.53	1.144	0.30(0.30)	0.99	33126.4	11330.00
16	44407.00	90.87	1.103	0.30(0.30)	0.99	37556.8	11130.00
17	44206.89	98.45	1.068	0.30(0.30)	0.99	41547.0	12330.00
18	43894.31	105.10	1.038	0.30(0.30)	0.99	44890.1	12400.00
19	43284.12	113.76	0.998	0.30(0.30)	0.99	48257.4	12201.00
20	42787.81	117.72	0.980	0.30(0.30)	0.99	49343.7	12111.00
21	42093.62	123.08	0.962	0.30(0.30)	0.99	50713.1	12101.10
22	41541.03	127.10	0.952	0.30(0.30)	0.99	51563.8	10400.00
23	39962.66	135.08	0.931	0.30(0.30)	0.99	52875.9	12010.00
24	38627.37	140.96	0.915	0.30(0.30)	0.99	53192.5	10210.00
25	38248.64	143.59	0.909	0.30(0.30)	0.99	53301.4	12000.00
26	35056.16	166.98	0.848	0.30(0.30)	0.99	53924.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	161.41	16.37	2.832	0.30(0.29)	0.97	70.7	50400.00

LONGEST FLOWPATH FROM NODE 50400.00 TO NODE 12903.00 = 3607.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23767.18	15.09	2.967	0.30(0.30)	0.99	3328.7	50200.00
2	24268.94	16.37	2.832	0.30(0.30)	0.99	3719.0	50400.00
3	27675.09	25.24	2.105	0.30(0.30)	0.99	6391.1	50300.00
4	29691.64	30.84	1.868	0.30(0.30)	0.99	7983.0	50120.00
5	29798.45	31.16	1.859	0.30(0.30)	0.99	8071.1	40500.00
6	29953.22	31.60	1.848	0.30(0.30)	0.99	8255.3	31200.00
7	30093.07	32.01	1.838	0.30(0.30)	0.99	8425.2	50150.00
8	31350.29	35.60	1.746	0.30(0.30)	0.99	9879.5	12710.00
9	31355.06	35.62	1.745	0.30(0.30)	0.99	9889.0	50100.00
10	32134.40	39.33	1.650	0.30(0.30)	0.99	11366.4	31810.00
11	32803.03	42.86	1.570	0.30(0.30)	0.99	12830.9	31400.00
12	34174.03	50.71	1.404	0.30(0.30)	0.99	15967.4	40100.00
13	36626.70	59.37	1.315	0.30(0.30)	0.99	19311.7	11801.00
14	39278.29	68.87	1.249	0.30(0.30)	0.99	23607.1	11530.00
15	41443.41	77.40	1.191	0.30(0.30)	0.99	28590.9	11910.00
16	43477.68	84.53	1.144	0.30(0.30)	0.99	33197.1	11330.00

17	44458.54	90.87	1.103	0.30(0.30)	0.99	37627.5	11130.00
18	44256.23	98.45	1.068	0.30(0.30)	0.99	41617.7	12330.00
19	43941.72	105.10	1.038	0.30(0.30)	0.99	44960.8	12400.00
20	43329.01	113.76	0.998	0.30(0.30)	0.99	48328.1	12201.00
21	42831.55	117.72	0.980	0.30(0.30)	0.99	49414.4	12111.00
22	42136.19	123.08	0.962	0.30(0.30)	0.99	50783.8	12101.10
23	41582.93	127.10	0.952	0.30(0.30)	0.99	51634.5	10400.00
24	40003.25	135.08	0.931	0.30(0.30)	0.99	52946.6	12010.00
25	38666.99	140.96	0.915	0.30(0.30)	0.99	53263.2	10210.00
26	38287.82	143.59	0.909	0.30(0.30)	0.99	53372.1	12000.00
27	35091.48	166.98	0.848	0.30(0.30)	0.99	53995.2	10100.00

TOTAL AREA(ACRES) = 53995.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 44458.54 Tc(MIN.) = 90.869
EFFECTIVE AREA(ACRES) = 37627.48 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 53995.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

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FLOW PROCESS FROM NODE 12903.00 TO NODE 12904.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

==========

ELEVATION DATA: UPSTREAM(FEET) = 214.00 DOWNSTREAM(FEET) = 213.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 767.57 CHANNEL SLOPE = 0.0013
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 16.34
CHANNEL FLOW THRU SUBAREA(CFS) = 44458.54
FLOW VELOCITY(FEET/SEC.) = 9.66 FLOW DEPTH(FEET) = 16.34
TRAVEL TIME(MIN.) = 1.32 Tc(MIN.) = 92.19
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23767.18	16.70	2.797	0.30(0.30)	0.99	3328.7	50200.00
2	24268.94	17.97	2.662	0.30(0.30)	0.99	3719.0	50400.00
3	27675.09	26.78	2.035	0.30(0.30)	0.99	6391.1	50300.00
4	29691.64	32.34	1.829	0.30(0.30)	0.99	7983.0	50120.00
5	29798.45	32.66	1.821	0.30(0.30)	0.99	8071.1	40500.00
6	29953.22	33.09	1.810	0.30(0.30)	0.99	8255.3	31200.00
7	30093.07	33.50	1.799	0.30(0.30)	0.99	8425.2	50150.00
8	31350.29	37.07	1.708	0.30(0.30)	0.99	9879.5	12710.00
9	31355.06	37.09	1.707	0.30(0.30)	0.99	9889.0	50100.00
10	32134.40	40.79	1.615	0.30(0.30)	0.99	11366.4	31810.00
11	32803.03	44.31	1.537	0.30(0.30)	0.99	12830.9	31400.00
12	34174.03	52.14	1.389	0.30(0.30)	0.99	15967.4	40100.00
13	36626.70	60.77	1.303	0.30(0.30)	0.99	19311.7	11801.00
14	39278.29	70.24	1.239	0.30(0.30)	0.99	23607.1	11530.00
15	41443.41	78.76	1.182	0.30(0.30)	0.99	28590.9	11910.00
16	43477.68	85.86	1.135	0.30(0.30)	0.99	33197.1	11330.00
17	44458.54	92.19	1.097	0.30(0.30)	0.99	37627.5	11130.00
18	44256.23	99.78	1.062	0.30(0.30)	0.99	41617.7	12330.00
19	43941.72	106.43	1.032	0.30(0.30)	0.99	44960.8	12400.00

20	43329.01	115.10	0.992	0.30(0.30)	0.99	48328.1	12201.00
21	42831.55	119.06	0.974	0.30(0.30)	0.99	49414.4	12111.00
22	42136.19	124.43	0.958	0.30(0.30)	0.99	50783.8	12101.10
23	41582.93	128.45	0.948	0.30(0.30)	0.99	51634.5	10400.00
24	40003.25	136.45	0.927	0.30(0.30)	0.99	52946.6	12010.00
25	38666.99	142.35	0.912	0.30(0.30)	0.99	53263.2	10210.00
26	38287.82	144.98	0.905	0.30(0.30)	0.99	53372.1	12000.00
27	35091.48	168.41	0.844	0.30(0.30)	0.99	53995.2	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 44458.54 Tc(MIN.) = 92.19
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37627.48

****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
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****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610311Y.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	179.31	26.98	0.30(0.29)	0.97	114.8	31100.00

TOTAL AREA(ACRES) = 114.8

****
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23767.18	16.70	2.797	0.30(0.30)	0.99	3328.7	50200.00
2	24268.94	17.97	2.662	0.30(0.30)	0.99	3719.0	50400.00
3	27675.09	26.78	2.035	0.30(0.30)	0.99	6391.1	50300.00
4	29691.64	32.34	1.829	0.30(0.30)	0.99	7983.0	50120.00
5	29798.45	32.66	1.821	0.30(0.30)	0.99	8071.1	40500.00
6	29953.22	33.09	1.810	0.30(0.30)	0.99	8255.3	31200.00
7	30093.07	33.50	1.799	0.30(0.30)	0.99	8425.2	50150.00
8	31350.29	37.07	1.708	0.30(0.30)	0.99	9879.5	12710.00
9	31355.06	37.09	1.707	0.30(0.30)	0.99	9889.0	50100.00
10	32134.40	40.79	1.615	0.30(0.30)	0.99	11366.4	31810.00
11	32803.03	44.31	1.537	0.30(0.30)	0.99	12830.9	31400.00
12	34174.03	52.14	1.389	0.30(0.30)	0.99	15967.4	40100.00
13	36626.70	60.77	1.303	0.30(0.30)	0.99	19311.7	11801.00
14	39278.29	70.24	1.239	0.30(0.30)	0.99	23607.1	11530.00
15	41443.41	78.76	1.182	0.30(0.30)	0.99	28590.9	11910.00
16	43477.68	85.86	1.135	0.30(0.30)	0.99	33197.1	11330.00
17	44458.54	92.19	1.097	0.30(0.30)	0.99	37627.5	11130.00
18	44256.23	99.78	1.062	0.30(0.30)	0.99	41617.7	12330.00

19	43941.72	106.43	1.032	0.30(0.30)	0.99	44960.8	12400.00
20	43329.01	115.10	0.992	0.30(0.30)	0.99	48328.1	12201.00
21	42831.55	119.06	0.974	0.30(0.30)	0.99	49414.4	12111.00
22	42136.19	124.43	0.958	0.30(0.30)	0.99	50783.8	12101.10
23	41582.93	128.45	0.948	0.30(0.30)	0.99	51634.5	10400.00
24	40003.25	136.45	0.927	0.30(0.30)	0.99	52946.6	12010.00
25	38666.99	142.35	0.912	0.30(0.30)	0.99	53263.2	10210.00
26	38287.82	144.98	0.905	0.30(0.30)	0.99	53372.1	12000.00
27	35091.48	168.41	0.844	0.30(0.30)	0.99	53995.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	179.31	26.98	2.026	0.30(0.29)	0.97	114.8	31100.00

LONGEST FLOWPATH FROM NODE 31100.00 TO NODE 12904.00 = 6503.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23927.46	16.70	2.797	0.30(0.30)	0.99	3399.8	50200.00
2	24432.14	17.97	2.662	0.30(0.30)	0.99	3795.5	50400.00
3	27854.00	26.78	2.035	0.30(0.30)	0.99	6505.1	50300.00
4	27926.46	26.98	2.026	0.30(0.30)	0.99	6562.8	31100.00
5	29850.59	32.34	1.829	0.30(0.30)	0.99	8097.8	50120.00
6	29956.55	32.66	1.821	0.30(0.30)	0.99	8185.9	40500.00
7	30110.18	33.09	1.810	0.30(0.30)	0.99	8370.1	31200.00
8	30248.94	33.50	1.799	0.30(0.30)	0.99	8540.0	50150.00
9	31496.72	37.07	1.708	0.30(0.30)	0.99	9994.3	12710.00
10	31501.43	37.09	1.707	0.30(0.30)	0.99	10003.8	50100.00
11	32271.27	40.79	1.615	0.30(0.30)	0.99	11481.3	31810.00
12	32931.82	44.31	1.537	0.30(0.30)	0.99	12945.7	31400.00
13	34287.50	52.14	1.389	0.30(0.30)	0.99	16082.2	40100.00
14	36731.28	60.77	1.303	0.30(0.30)	0.99	19426.5	11801.00
15	39376.32	70.24	1.239	0.30(0.30)	0.99	23721.9	11530.00
16	41535.55	78.76	1.182	0.30(0.30)	0.99	28705.8	11910.00
17	43564.90	85.86	1.135	0.30(0.30)	0.99	33311.9	11330.00
18	44541.86	92.19	1.097	0.30(0.30)	0.99	37742.3	11130.00
19	44335.97	99.78	1.062	0.30(0.30)	0.99	41732.5	12330.00
20	44018.33	106.43	1.032	0.30(0.30)	0.99	45075.6	12400.00
21	43401.53	115.10	0.992	0.30(0.30)	0.99	48442.9	12201.00
22	42902.20	119.06	0.974	0.30(0.30)	0.99	49529.2	12111.00
23	42205.20	124.43	0.958	0.30(0.30)	0.99	50898.6	12101.10
24	41650.87	128.45	0.948	0.30(0.30)	0.99	51749.3	10400.00
25	40069.04	136.45	0.927	0.30(0.30)	0.99	53061.4	12010.00
26	38731.19	142.35	0.912	0.30(0.30)	0.99	53378.0	10210.00
27	38351.32	144.98	0.905	0.30(0.30)	0.99	53486.9	12000.00
28	35148.69	168.41	0.844	0.30(0.30)	0.99	54110.0	10100.00

TOTAL AREA(ACRES) = 54110.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 44541.86 Tc(MIN.) = 92.193
EFFECTIVE AREA(ACRES) = 37742.30 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 54110.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.
==========
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 54110.0 TC(MIN.) = 92.19
EFFECTIVE AREA(ACRES) = 37742.30 AREA-AVERAGED Fm(INCH/HR)= 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.993
PEAK FLOW RATE(CFS) = 44541.86

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23927.46	16.70	2.797	0.30(0.30)	0.99	3399.8	50200.00
2	24432.14	17.97	2.662	0.30(0.30)	0.99	3795.5	50400.00
3	27854.00	26.78	2.035	0.30(0.30)	0.99	6505.1	50300.00
4	27926.46	26.98	2.026	0.30(0.30)	0.99	6562.8	31100.00
5	29850.59	32.34	1.829	0.30(0.30)	0.99	8097.8	50120.00
6	29956.55	32.66	1.821	0.30(0.30)	0.99	8185.9	40500.00
7	30110.18	33.09	1.810	0.30(0.30)	0.99	8370.1	31200.00
8	30248.94	33.50	1.799	0.30(0.30)	0.99	8540.0	50150.00
9	31496.72	37.07	1.708	0.30(0.30)	0.99	9994.3	12710.00
10	31501.43	37.09	1.707	0.30(0.30)	0.99	10003.8	50100.00
11	32271.27	40.79	1.615	0.30(0.30)	0.99	11481.3	31810.00
12	32931.82	44.31	1.537	0.30(0.30)	0.99	12945.7	31400.00
13	34287.50	52.14	1.389	0.30(0.30)	0.99	16082.2	40100.00
14	36731.28	60.77	1.303	0.30(0.30)	0.99	19426.5	11801.00
15	39376.32	70.24	1.239	0.30(0.30)	0.99	23721.9	11530.00
16	41535.55	78.76	1.182	0.30(0.30)	0.99	28705.8	11910.00
17	43564.90	85.86	1.135	0.30(0.30)	0.99	33311.9	11330.00
18	44541.86	92.19	1.097	0.30(0.30)	0.99	37742.3	11130.00
19	44335.97	99.78	1.062	0.30(0.30)	0.99	41732.5	12330.00
20	44018.33	106.43	1.032	0.30(0.30)	0.99	45075.6	12400.00
21	43401.53	115.10	0.992	0.30(0.30)	0.99	48442.9	12201.00
22	42902.20	119.06	0.974	0.30(0.30)	0.99	49529.2	12111.00
23	42205.20	124.43	0.958	0.30(0.30)	0.99	50898.6	12101.10
24	41650.87	128.45	0.948	0.30(0.30)	0.99	51749.3	10400.00
25	40069.04	136.45	0.927	0.30(0.30)	0.99	53061.4	12010.00
26	38731.19	142.35	0.912	0.30(0.30)	0.99	53378.0	10210.00
27	38351.32	144.98	0.905	0.30(0.30)	0.99	53486.9	12000.00
28	35148.69	168.41	0.844	0.30(0.30)	0.99	54110.0	10100.00

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END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S30.DAT
  TIME/DATE OF STUDY: 11:54 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.800
   2)   10.00;  3.258
   3)   15.00;  2.590
   4)   20.00;  2.201
   5)   25.00;  1.940
   6)   30.00;  1.740
   7)   40.00;  1.487
   8)   50.00;  1.310
   9)   60.00;  1.150
  10)   90.00;  0.940
  11)  120.00;  0.798
  12)  180.00;  0.647
  13)  360.00;  0.452
  14) 1440.00;  0.187
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13000.00 TO NODE  13001.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   279.24
  ELEVATION DATA: UPSTREAM(FEET) =   1187.54  DOWNSTREAM(FEET) =   1104.45

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.560
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.702
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.65      0.30     1.000     0    8.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.99
  TOTAL AREA(ACRES) =      0.65   PEAK FLOW RATE(CFS) =      1.99

**************************************************************************
  FLOW PROCESS FROM NODE  13001.00 TO NODE  13002.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1104.45  DOWNSTREAM(FEET) =   1034.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   736.73   CHANNEL SLOPE =  0.0945
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.39
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.224
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       19.74      0.30     0.968     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.968
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.26
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   1.69
  Tc(MIN.) =   10.25
  SUBAREA AREA(ACRES) =    19.74       SUBAREA RUNOFF(CFS) =   52.13
  EFFECTIVE AREA(ACRES) =     20.39     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =       20.4          PEAK FLOW RATE(CFS) =      53.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =   9.20
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13002.00 =    1015.97 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13002.00 TO NODE  13003.00 IS CODE =  56
```

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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1034.82  DOWNSTREAM(FEET) =    986.71
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1305.95   CHANNEL SLOPE =  0.0368
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.922
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       83.90      0.30     0.904     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.62
  AVERAGE FLOW DEPTH(FEET) =   1.28   TRAVEL TIME(MIN.) =   2.26
  Tc(MIN.) =   12.51
  SUBAREA AREA(ACRES) =    83.90       SUBAREA RUNOFF(CFS) =  200.18
  EFFECTIVE AREA(ACRES) =    104.29     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =      104.3         PEAK FLOW RATE(CFS) =     248.47
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.67   FLOW VELOCITY(FEET/SEC.) =  11.17
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13003.00 =    2321.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13003.00 TO NODE  13004.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    986.71  DOWNSTREAM(FEET) =    939.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1318.54   CHANNEL SLOPE =  0.0361
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.673
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       47.44      0.30     0.871     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.871
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     299.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.76
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   1.87
  Tc(MIN.) =   14.38
  SUBAREA AREA(ACRES) =    47.44       SUBAREA RUNOFF(CFS) =  102.95
  EFFECTIVE AREA(ACRES) =    151.73     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =      151.7         PEAK FLOW RATE(CFS) =     328.00
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.96   FLOW VELOCITY(FEET/SEC.) =  12.05
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13004.00 =    3640.46 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    939.06  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1954.61   CHANNEL SLOPE =  0.0397
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.447
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       77.87      0.30     0.856     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.856
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     404.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.25
  AVERAGE FLOW DEPTH(FEET) =   2.14   TRAVEL TIME(MIN.) =   2.46
  Tc(MIN.) =   16.84
  SUBAREA AREA(ACRES) =    77.87       SUBAREA RUNOFF(CFS) =  153.49
  EFFECTIVE AREA(ACRES) =    229.60     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =      229.6         PEAK FLOW RATE(CFS) =     450.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.26   FLOW VELOCITY(FEET/SEC.) =  13.71
  LONGEST FLOWPATH FROM NODE  13000.00 TO NODE  13020.00 =    5595.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13004.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.84
  RAINFALL INTENSITY(INCH/HR) =   2.45
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     229.60
  TOTAL STREAM AREA(ACRES) =     229.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     450.66
```

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****************************************************************************
  FLOW PROCESS FROM NODE  13010.00 TO NODE  13011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   284.64
  ELEVATION DATA: UPSTREAM(FEET) =   1190.91  DOWNSTREAM(FEET) =   1110.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.716
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.654
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BROWSH"                -        0.91      0.30     1.000     0    8.72
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.75
  TOTAL AREA(ACRES) =      0.91   PEAK FLOW RATE(CFS) =      2.75

****************************************************************************
  FLOW PROCESS FROM NODE  13011.00 TO NODE  13012.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1110.50  DOWNSTREAM ELEVATION(FEET) = 1068.16
  STREET LENGTH(FEET) =   581.12   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.53
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   11.21
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.28
  STREET FLOW TRAVEL TIME(MIN.) =   1.54   Tc(MIN.) =   10.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.223
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                 -       10.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   10.46      SUBAREA RUNOFF(CFS) =   27.52
  EFFECTIVE AREA(ACRES) =     11.37    AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
```



```
  TOTAL AREA(ACRES) =       11.4        PEAK FLOW RATE(CFS) =      29.92

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  14.57
  FLOW VELOCITY(FEET/SEC.) =  7.16   DEPTH*VELOCITY(FT*FT/SEC.) =   3.03
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13012.00 =     865.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13012.00 TO NODE  13013.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1068.16  DOWNSTREAM ELEVATION(FEET) =  994.58
  STREET LENGTH(FEET) =  1505.98   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.16
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   22.30
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.57
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.24
  STREET FLOW TRAVEL TIME(MIN.) =   3.32   Tc(MIN.) =   13.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.780
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                 -       35.49      0.30     0.901     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.901
  SUBAREA AREA(ACRES) =   35.49      SUBAREA RUNOFF(CFS) =   80.17
  EFFECTIVE AREA(ACRES) =     46.86    AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.93
  TOTAL AREA(ACRES) =       46.9        PEAK FLOW RATE(CFS) =     105.55

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  26.21
  FLOW VELOCITY(FEET/SEC.) =  8.34   DEPTH*VELOCITY(FT*FT/SEC.) =   5.26
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13013.00 =    2371.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13013.00 TO NODE  13014.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    994.58  DOWNSTREAM(FEET) =    944.96
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1798.86   CHANNEL SLOPE =  0.0276
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  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.55
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.446
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.31      0.30     0.616     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.616
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     180.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.14
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   3.28
  Tc(MIN.) =   16.86
  SUBAREA AREA(ACRES) =    73.31       SUBAREA RUNOFF(CFS) =  149.17
  EFFECTIVE AREA(ACRES) =    120.17     AREA-AVERAGED Fm(INCH/HR) =   0.22
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.74
  TOTAL AREA(ACRES) =      120.2         PEAK FLOW RATE(CFS) =     240.62
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.77   FLOW VELOCITY(FEET/SEC.) =  10.01
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13014.00 =    4170.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    944.96  DOWNSTREAM(FEET) =    861.53
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1519.40   CHANNEL SLOPE =  0.0549
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.72
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.303
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.22      0.30     0.810     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.810
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     315.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.79
  AVERAGE FLOW DEPTH(FEET) =   1.70   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   18.69
  SUBAREA AREA(ACRES) =    80.22       SUBAREA RUNOFF(CFS) =  148.71
  EFFECTIVE AREA(ACRES) =    200.39     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.77
  TOTAL AREA(ACRES) =      200.4         PEAK FLOW RATE(CFS) =     373.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.87   FLOW VELOCITY(FEET/SEC.) =  14.53
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  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13014.00 TO NODE  13020.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.69
  RAINFALL INTENSITY(INCH/HR) =   2.30
  AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.77
  EFFECTIVE STREAM AREA(ACRES) =     200.39
  TOTAL STREAM AREA(ACRES) =     200.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     373.87

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      450.66   16.84    2.447  0.30( 0.27) 0.89     229.6   13000.00
      2      373.87   18.69    2.303  0.30( 0.23) 0.77     200.4   13010.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      810.90   16.84    2.447  0.30( 0.25) 0.83     410.1   13000.00
      2      794.76   18.69    2.303  0.30( 0.25) 0.83     430.0   13010.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     810.90    Tc(MIN.) =    16.84
  EFFECTIVE AREA(ACRES) =     410.14   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =      430.0
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13020.00 =    5690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13020.00 TO NODE  13021.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    861.53  DOWNSTREAM(FEET) =    843.84
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1274.71   CHANNEL SLOPE =  0.0139
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.249
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       80.78      0.30     0.818     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.818
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     883.74
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.34
 AVERAGE FLOW DEPTH(FEET) =   1.90   TRAVEL TIME(MIN.) =   2.55
 Tc(MIN.) =   19.39
 SUBAREA AREA(ACRES) =    80.78       SUBAREA RUNOFF(CFS) =  145.64
 EFFECTIVE AREA(ACRES) =    490.92     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =      510.8         PEAK FLOW RATE(CFS) =     883.37
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.90

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.90   FLOW VELOCITY(FEET/SEC.) =   8.33
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13021.00 =    6964.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      883.37   19.39    2.249  0.30( 0.25) 0.83     490.9   13000.00
     2      867.41   21.26    2.135  0.30( 0.25) 0.83     510.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     883.37  Tc(MIN.) =   19.39
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     490.92

****************************************************************************
 FLOW PROCESS FROM NODE  13021.00 TO NODE  13022.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    843.84  DOWNSTREAM(FEET) =    842.14
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1448.62   CHANNEL SLOPE =  0.0012
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.15
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.911
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      124.44      0.30     0.803     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.803
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     977.00
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.81
 AVERAGE FLOW DEPTH(FEET) =   4.11   TRAVEL TIME(MIN.) =   6.33
 Tc(MIN.) =   25.72
 SUBAREA AREA(ACRES) =   124.44       SUBAREA RUNOFF(CFS) =  187.08
 EFFECTIVE AREA(ACRES) =    615.36     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =      635.2         PEAK FLOW RATE(CFS) =     921.42
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.98

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  3.98   FLOW VELOCITY(FEET/SEC.) =   3.74
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13022.00 =    8413.33 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      921.42   25.72    1.911  0.30( 0.25) 0.83     615.4   13000.00
     2      907.73   27.63    1.835  0.30( 0.25) 0.82     635.2   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     921.42  Tc(MIN.) =   25.72
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =     615.36

****************************************************************************
 FLOW PROCESS FROM NODE  13022.00 TO NODE  13023.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    842.14  DOWNSTREAM(FEET) =    806.85
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1432.95   CHANNEL SLOPE =  0.0246
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.89
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.825
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      324.46      0.30     0.786     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.786
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1153.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.03
 AVERAGE FLOW DEPTH(FEET) =   1.88   TRAVEL TIME(MIN.) =   2.17
 Tc(MIN.) =   27.88
 SUBAREA AREA(ACRES) =   324.46       SUBAREA RUNOFF(CFS) =  463.99
 EFFECTIVE AREA(ACRES) =    939.82     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =      959.7         PEAK FLOW RATE(CFS) =    1337.45
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.05

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.05   FLOW VELOCITY(FEET/SEC.) =  11.62
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13023.00 =    9846.28 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1337.45   27.88    1.825  0.30( 0.24) 0.81     939.8   13000.00
     2     1299.23   29.81    1.747  0.30( 0.24) 0.81     959.7   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1337.45  Tc(MIN.) =   27.88
 AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =     939.82

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 FLOW PROCESS FROM NODE  13023.00 TO NODE  13024.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    806.85  DOWNSTREAM(FEET) =    767.07
 CHANNEL LENGTH THRU SUBAREA(FEET) =   940.17   CHANNEL SLOPE =  0.0423
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.94
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.782
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      367.12      0.30     0.795     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.795
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1592.48
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.75
 AVERAGE FLOW DEPTH(FEET) =   1.94   TRAVEL TIME(MIN.) =   1.06
 Tc(MIN.) =   28.95
 SUBAREA AREA(ACRES) =   367.12       SUBAREA RUNOFF(CFS) =  510.06
 EFFECTIVE AREA(ACRES) =   1306.94     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     1326.8         PEAK FLOW RATE(CFS) =    1811.56
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.09

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.09   FLOW VELOCITY(FEET/SEC.) =  15.42
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13024.00 =   10786.45 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1811.56   28.95    1.782  0.30( 0.24) 0.81    1306.9   13000.00
     2     1762.04   30.89    1.717  0.30( 0.24) 0.81    1326.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1811.56  Tc(MIN.) =   28.95
 AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1306.94

********************************************************************************
 FLOW PROCESS FROM NODE  13024.00 TO NODE  13025.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    767.07  DOWNSTREAM(FEET) =    697.38
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3026.62   CHANNEL SLOPE =  0.0230
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.67
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.669
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
 USER-DEFINED               -      315.24      0.30     0.867     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2011.50
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.10
 AVERAGE FLOW DEPTH(FEET) =   2.65   TRAVEL TIME(MIN.) =   3.85
 Tc(MIN.) =   32.80
 SUBAREA AREA(ACRES) =   315.24       SUBAREA RUNOFF(CFS) =  399.81
 EFFECTIVE AREA(ACRES) =   1622.18     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
 TOTAL AREA(ACRES) =     1642.0         PEAK FLOW RATE(CFS) =    2078.52
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.70

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.70   FLOW VELOCITY(FEET/SEC.) =  13.26
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13025.00 =   13813.07 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     2078.52   32.80    1.669  0.30( 0.25) 0.82    1622.2   13000.00
     2     2030.15   34.78    1.619  0.30( 0.25) 0.82    1642.0   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2078.52  Tc(MIN.) =   32.80
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    1622.18

********************************************************************************
 FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE =  56
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    697.38  DOWNSTREAM(FEET) =    662.66
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2362.69   CHANNEL SLOPE =  0.0147
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.27
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.585
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      374.11      0.30     0.748     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.748
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2307.62
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.83
 AVERAGE FLOW DEPTH(FEET) =   3.26   TRAVEL TIME(MIN.) =   3.33
 Tc(MIN.) =   36.13
 SUBAREA AREA(ACRES) =   374.11       SUBAREA RUNOFF(CFS) =  458.14
 EFFECTIVE AREA(ACRES) =   1996.29     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     2016.1         PEAK FLOW RATE(CFS) =    2413.71
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.35
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.35   FLOW VELOCITY(FEET/SEC.) =  11.99
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13026.00 =   16175.76 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2413.71   36.13    1.585  0.30( 0.24) 0.81    1996.3   13000.00
      2     2345.64   38.14    1.534  0.30( 0.24) 0.81    2016.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2413.71  Tc(MIN.) =   36.13
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    1996.29
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     2016.1  TC(MIN.) =     36.13
  EFFECTIVE AREA(ACRES) =   1996.29  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.805
  PEAK FLOW RATE(CFS)   =    2413.71

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2413.71   36.13    1.585  0.30( 0.24) 0.81    1996.3   13000.00
      2     2345.64   38.14    1.534  0.30( 0.24) 0.81    2016.1   13010.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S31.DAT
  TIME/DATE OF STUDY: 11:54 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.800
   2)   10.00;  3.258
   3)   15.00;  2.590
   4)   20.00;  2.201
   5)   25.00;  1.940
   6)   30.00;  1.740
   7)   40.00;  1.487
   8)   50.00;  1.310
   9)   60.00;  1.150
  10)   90.00;  0.940
  11)  120.00;  0.798
  12)  180.00;  0.647
  13)  360.00;  0.452
  14) 1440.00;  0.187
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13100.00 TO NODE  13101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   282.58
  ELEVATION DATA: UPSTREAM(FEET) =   1069.66  DOWNSTREAM(FEET) =    969.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.312
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.779
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.94      0.30     1.000     0    8.31
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.94
  TOTAL AREA(ACRES) =      0.94   PEAK FLOW RATE(CFS) =      2.94

**************************************************************************
  FLOW PROCESS FROM NODE  13101.00 TO NODE  13102.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    969.92  DOWNSTREAM(FEET) =    807.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.89   CHANNEL SLOPE =  0.2444
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.174
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.67      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.79
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   2.32
  Tc(MIN.) =   10.63
  SUBAREA AREA(ACRES) =     7.67       SUBAREA RUNOFF(CFS) =   19.84
  EFFECTIVE AREA(ACRES) =      8.61     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.6          PEAK FLOW RATE(CFS) =      22.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.36   FLOW VELOCITY(FEET/SEC.) =   5.85
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13102.00 =     948.47 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13102.00 TO NODE  13103.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    807.20  DOWNSTREAM(FEET) =    769.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   691.01   CHANNEL SLOPE =  0.0539
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.841
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       20.65      0.30     0.999     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.62
  AVERAGE FLOW DEPTH(FEET) =   0.85   TRAVEL TIME(MIN.) =   2.49
  Tc(MIN.) =   13.12
  SUBAREA AREA(ACRES) =    20.65       SUBAREA RUNOFF(CFS) =   47.23
  EFFECTIVE AREA(ACRES) =     29.26     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       29.3         PEAK FLOW RATE(CFS) =      66.93
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.06   FLOW VELOCITY(FEET/SEC.) =   5.23
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13103.00 =    1639.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   769.94  DOWNSTREAM(FEET) =   693.88
  FLOW LENGTH(FEET) =  1563.10   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  17.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.54
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      66.93
  PIPE TRAVEL TIME(MIN.) =   1.33    Tc(MIN.) =   14.45
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13104.00 =    3202.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13103.00 TO NODE  13104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.663
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       28.00      0.30     0.750     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.750
  SUBAREA AREA(ACRES) =   28.00      SUBAREA RUNOFF(CFS) =   61.44
  EFFECTIVE AREA(ACRES) =     57.26   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =       57.3       PEAK FLOW RATE(CFS) =     123.67

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   693.88  DOWNSTREAM(FEET) =   645.69
  FLOW LENGTH(FEET) =  1068.98   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.57
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     123.67
  PIPE TRAVEL TIME(MIN.) =   0.83    Tc(MIN.) =   15.28
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13105.00 =    4271.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13104.00 TO NODE  13105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.568
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.28      0.30     0.867     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.867
  SUBAREA AREA(ACRES) =   35.28      SUBAREA RUNOFF(CFS) =   73.29
  EFFECTIVE AREA(ACRES) =     92.54   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =       92.5       PEAK FLOW RATE(CFS) =     192.08

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.69  DOWNSTREAM(FEET) =   608.48
  FLOW LENGTH(FEET) =  1127.55   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.41
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     192.08
  PIPE TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =   16.16
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  81
```

```
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   16.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.500
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       37.68      0.30     0.889     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.889
  SUBAREA AREA(ACRES) =   37.68      SUBAREA RUNOFF(CFS) =   75.74
  EFFECTIVE AREA(ACRES) =    130.22   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =      130.2       PEAK FLOW RATE(CFS) =     262.13

******************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  10
------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 15.1
------------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S30.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2413.71   36.13  0.30( 0.24) 0.81    1996.3   13000.00
      2     2345.64   38.14  0.30( 0.24) 0.81    2016.1   13010.00
    TOTAL AREA(ACRES) =     2016.1

******************************************************************************
  FLOW PROCESS FROM NODE  13025.00 TO NODE  13026.00 IS CODE = 14.0
------------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2413.71   36.13  0.30( 0.24) 0.81    1996.3   13000.00
      2     2345.64   38.14  0.30( 0.24) 0.81    2016.1   13010.00
    TOTAL AREA(ACRES) =      2016.1

******************************************************************************
  FLOW PROCESS FROM NODE  13026.00 TO NODE  13106.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    662.66  DOWNSTREAM(FEET) =    608.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3098.88   CHANNEL SLOPE =  0.0175
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
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  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.484
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       75.28      0.30     0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2456.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.80
  AVERAGE FLOW DEPTH(FEET) =   3.22   TRAVEL TIME(MIN.) =   4.03
  Tc(MIN.) =   40.16
  SUBAREA AREA(ACRES) =    75.28       SUBAREA RUNOFF(CFS) =   85.21
  EFFECTIVE AREA(ACRES) =   2071.57     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     2091.4         PEAK FLOW RATE(CFS) =    2413.71
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.19   FLOW VELOCITY(FEET/SEC.) =  12.72
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2413.71   40.16    1.484  0.30( 0.24) 0.80    2071.6   13000.00
      2     2345.64   42.22    1.448  0.30( 0.24) 0.80    2091.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2413.71  Tc(MIN.) =   40.16
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    2071.57

******************************************************************************
  FLOW PROCESS FROM NODE  13105.00 TO NODE  13106.00 IS CODE =  11
------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2413.71   40.16    1.484  0.30( 0.24) 0.80    2071.6   13000.00
      2     2345.64   42.22    1.448  0.30( 0.24) 0.80    2091.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      262.13   16.16    2.500  0.30( 0.26) 0.88     130.2   13100.00
  LONGEST FLOWPATH FROM NODE  13100.00 TO NODE  13106.00 =    5399.11 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2026.72   16.16    2.500  0.30( 0.24) 0.81     963.7   13100.00
```

```
      2     2556.79   40.16    1.484  0.30( 0.24) 0.81    2201.8   13000.00
      3     2484.46   42.22    1.448  0.30( 0.24) 0.81    2221.6   13010.00
    TOTAL AREA(ACRES) =      2221.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2556.79  Tc(MIN.) =   40.160
  EFFECTIVE AREA(ACRES) =   2201.79  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     2221.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13106.00 =   19274.64 FEET.

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  FLOW PROCESS FROM NODE  13106.00 TO NODE  13107.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    608.48  DOWNSTREAM(FEET) =    584.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1650.20   CHANNEL SLOPE =  0.0147
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.55
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.445
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      190.45      0.30     0.755     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.755
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2661.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.38
  AVERAGE FLOW DEPTH(FEET) =   3.54   TRAVEL TIME(MIN.) =   2.22
  Tc(MIN.) =   42.38
  SUBAREA AREA(ACRES) =   190.45       SUBAREA RUNOFF(CFS) =  208.84
  EFFECTIVE AREA(ACRES) =   2392.24     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     2412.1         PEAK FLOW RATE(CFS) =    2591.73
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.49   FLOW VELOCITY(FEET/SEC.) =  12.27
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13107.00 =   20924.84 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2155.16   18.52    2.316  0.30( 0.24) 0.80    1154.1   13100.00
      2     2591.73   42.38    1.445  0.30( 0.24) 0.80    2392.2   13000.00
      3     2533.72   44.46    1.408  0.30( 0.24) 0.80    2412.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2591.73  Tc(MIN.) =   42.38
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.80  EFFECTIVE AREA(ACRES) =    2392.24

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  FLOW PROCESS FROM NODE  13107.00 TO NODE  13108.00 IS CODE =  56
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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.29  DOWNSTREAM(FEET) =    563.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1061.67   CHANNEL SLOPE =  0.0193
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.34
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.422
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      314.12      0.30     0.939     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.939
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2752.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.74
  AVERAGE FLOW DEPTH(FEET) =   3.34   TRAVEL TIME(MIN.) =   1.29
  Tc(MIN.) =   43.67
  SUBAREA AREA(ACRES) =   314.12       SUBAREA RUNOFF(CFS) =  322.40
  EFFECTIVE AREA(ACRES) =   2706.36     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     2726.2         PEAK FLOW RATE(CFS) =    2865.05
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.42   FLOW VELOCITY(FEET/SEC.) =  13.93
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13108.00 =   21986.51 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2592.15   19.87    2.211  0.30( 0.25) 0.83    1468.2   13100.00
      2     2865.05   43.67    1.422  0.30( 0.25) 0.82    2706.4   13000.00
      3     2795.85   45.75    1.385  0.30( 0.25) 0.82    2726.2   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2865.05  Tc(MIN.) =   43.67
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2706.36

****************************************************************************
  FLOW PROCESS FROM NODE  13108.00 TO NODE  13109.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    563.78  DOWNSTREAM(FEET) =    541.61
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1657.28   CHANNEL SLOPE =  0.0134
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.383
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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  USER-DEFINED               -      203.63      0.30     0.785     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.785
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2970.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.45
  AVERAGE FLOW DEPTH(FEET) =   3.87   TRAVEL TIME(MIN.) =   2.22
  Tc(MIN.) =   45.89
  SUBAREA AREA(ACRES) =   203.63       SUBAREA RUNOFF(CFS) =  210.27
  EFFECTIVE AREA(ACRES) =   2909.99     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     2929.8          PEAK FLOW RATE(CFS) =    2979.64
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.88   FLOW VELOCITY(FEET/SEC.) =  12.46
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13109.00 =   23643.79 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2770.50   22.14    2.089  0.30( 0.25) 0.83    1671.9   13100.00
      2     2979.64   45.89    1.383  0.30( 0.25) 0.82    2910.0   13000.00
      3     2902.18   47.99    1.346  0.30( 0.24) 0.82    2929.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2979.64  Tc(MIN.) =   45.89
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    2909.99

****************************************************************************
  FLOW PROCESS FROM NODE  13109.00 TO NODE  13110.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    541.61  DOWNSTREAM(FEET) =    509.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2016.96   CHANNEL SLOPE =  0.0157
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.338
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      283.06      0.30     0.791     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.791
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3119.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.35
  AVERAGE FLOW DEPTH(FEET) =   3.80   TRAVEL TIME(MIN.) =   2.52
  Tc(MIN.) =   48.41
  SUBAREA AREA(ACRES) =   283.06       SUBAREA RUNOFF(CFS) =  280.48
  EFFECTIVE AREA(ACRES) =   3193.05     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3212.9          PEAK FLOW RATE(CFS) =    3143.42
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
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  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.82   FLOW VELOCITY(FEET/SEC.) =  13.39
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13110.00 =   25660.75 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3007.91   24.69    1.956  0.30( 0.25) 0.82    1954.9   13100.00
      2     3143.42   48.41    1.338  0.30( 0.24) 0.81    3193.0   13000.00
      3     3057.10   50.53    1.302  0.30( 0.24) 0.81    3212.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3143.42  Tc(MIN.) =   48.41
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3193.05

****************************************************************************
  FLOW PROCESS FROM NODE  13110.00 TO NODE  13111.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    509.94  DOWNSTREAM(FEET) =    461.07
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3058.95   CHANNEL SLOPE =  0.0160
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.276
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      248.05      0.30     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3259.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.63
  AVERAGE FLOW DEPTH(FEET) =   3.88   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   52.15
  SUBAREA AREA(ACRES) =   248.05       SUBAREA RUNOFF(CFS) =  232.35
  EFFECTIVE AREA(ACRES) =   3441.10     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3460.9          PEAK FLOW RATE(CFS) =    3195.97
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.84   FLOW VELOCITY(FEET/SEC.) =  13.53
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13111.00 =   28719.70 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3085.80   28.46    1.802  0.30( 0.25) 0.82    2203.0   13100.00
      2     3195.97   52.15    1.276  0.30( 0.24) 0.81    3441.1   13000.00
      3     3107.04   54.31    1.241  0.30( 0.24) 0.81    3460.9   13010.00
  NEW PEAK FLOW DATA ARE:
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  PEAK FLOW RATE(CFS) =    3195.97  Tc(MIN.) =   52.15
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3441.10

****************************************************************************
  FLOW PROCESS FROM NODE  13111.00 TO NODE  13112.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    461.07  DOWNSTREAM(FEET) =    452.77
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1781.78   CHANNEL SLOPE =  0.0047
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.223
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      179.91      0.30     0.694     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.694
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3278.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.96
  AVERAGE FLOW DEPTH(FEET) =   5.50   TRAVEL TIME(MIN.) =   3.32
  Tc(MIN.) =   55.46
  SUBAREA AREA(ACRES) =   179.91       SUBAREA RUNOFF(CFS) =  164.26
  EFFECTIVE AREA(ACRES) =   3621.01     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3640.9         PEAK FLOW RATE(CFS) =    3195.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.42   FLOW VELOCITY(FEET/SEC.) =   8.90
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13112.00 =   30501.48 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3114.18   31.80    1.694  0.30( 0.24) 0.81    2382.9   13100.00
      2     3195.97   55.46    1.223  0.30( 0.24) 0.81    3621.0   13000.00
      3     3107.04   57.65    1.188  0.30( 0.24) 0.81    3640.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3195.97  Tc(MIN.) =   55.46
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3621.01

****************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    452.77  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1625.01   CHANNEL SLOPE =  0.0155
```



```
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.92
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.191
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      155.96      0.30     0.836     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.836
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3261.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.51
  AVERAGE FLOW DEPTH(FEET) =   3.91   TRAVEL TIME(MIN.) =   2.00
  Tc(MIN.) =   57.47
  SUBAREA AREA(ACRES) =   155.96       SUBAREA RUNOFF(CFS) =  131.91
  EFFECTIVE AREA(ACRES) =   3776.97     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     3796.8         PEAK FLOW RATE(CFS) =    3223.29
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.89   FLOW VELOCITY(FEET/SEC.) =  13.45
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3200.30   33.81    1.643  0.30( 0.24) 0.81    2538.8   13100.00
      2     3223.29   57.47    1.191  0.30( 0.24) 0.81    3777.0   13000.00
      3     3119.89   59.67    1.155  0.30( 0.24) 0.81    3796.8   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3223.29  Tc(MIN.) =   57.47
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81  EFFECTIVE AREA(ACRES) =    3776.97
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     3796.8  TC(MIN.) =     57.47
  EFFECTIVE AREA(ACRES) =   3776.97  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.808
  PEAK FLOW RATE(CFS)   =    3223.29

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3200.30   33.81    1.643  0.30( 0.24) 0.81    2538.8   13100.00
      2     3223.29   57.47    1.191  0.30( 0.24) 0.81    3777.0   13000.00
      3     3119.89   59.67    1.155  0.30( 0.24) 0.81    3796.8   13010.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2010 Advanced Engineering Software (aes)
              Ver. 17.0  Release Date: 07/01/2010  License ID 1527

                          Analysis prepared by:




--------------------------------------------------------------------------
  FILE NAME: S32.DAT
  TIME/DATE OF STUDY: 11:54 04/03/2013
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.800
   2)   10.00;  3.258
   3)   15.00;  2.590
   4)   20.00;  2.201
   5)   25.00;  1.940
   6)   30.00;  1.740
   7)   40.00;  1.487
   8)   50.00;  1.310
   9)   60.00;  1.150
  10)   90.00;  0.940
  11)  120.00;  0.798
  12)  180.00;  0.647
  13)  360.00;  0.452
  14) 1440.00;  0.187
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13200.00 TO NODE  13201.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   298.57
  ELEVATION DATA: UPSTREAM(FEET) =   1069.04  DOWNSTREAM(FEET) =   1005.76

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.410
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.440
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        0.67      0.30     1.000     0    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.89
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      1.89

**************************************************************************
  FLOW PROCESS FROM NODE  13201.00 TO NODE  13202.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1005.76  DOWNSTREAM(FEET) =    896.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   747.55   CHANNEL SLOPE =  0.1455
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.891
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.74
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   3.33
  Tc(MIN.) =   12.74
  SUBAREA AREA(ACRES) =     7.41       SUBAREA RUNOFF(CFS) =   17.28
  EFFECTIVE AREA(ACRES) =      8.08     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.1          PEAK FLOW RATE(CFS) =      18.84
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   4.65
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13202.00 =    1046.12 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  31
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   896.98  DOWNSTREAM(FEET) =   840.27
  FLOW LENGTH(FEET) =  1789.59   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  10.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.82
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.84
  PIPE TRAVEL TIME(MIN.) =   2.52    Tc(MIN.) =   15.27
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13203.00 =    2835.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13202.00 TO NODE  13203.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   15.27
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.569
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.89      0.30     0.731     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.731
  SUBAREA AREA(ACRES) =   38.89      SUBAREA RUNOFF(CFS) =   82.25
  EFFECTIVE AREA(ACRES) =     46.97   AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.78
  TOTAL AREA(ACRES) =       47.0       PEAK FLOW RATE(CFS) =      98.76

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   840.27  DOWNSTREAM(FEET) =   782.97
  FLOW LENGTH(FEET) =   992.54   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  21.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.89
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      98.76
  PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =   15.99
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13204.00 =    3828.25 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13203.00 TO NODE  13204.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   15.99
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.513
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       83.09      0.30     0.645     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.645
  SUBAREA AREA(ACRES) =   83.09      SUBAREA RUNOFF(CFS) =  173.46
  EFFECTIVE AREA(ACRES) =    130.06   AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      130.1       PEAK FLOW RATE(CFS) =     269.84

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   782.97  DOWNSTREAM(FEET) =   692.52
  FLOW LENGTH(FEET) =  2046.57   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  37.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  25.93
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     269.84
  PIPE TRAVEL TIME(MIN.) =   1.32    Tc(MIN.) =   17.30
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13205.00 =    5874.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13204.00 TO NODE  13205.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   17.30
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.411
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       88.51      0.30     0.679     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.679
  SUBAREA AREA(ACRES) =   88.51      SUBAREA RUNOFF(CFS) =  175.81
  EFFECTIVE AREA(ACRES) =    218.57   AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      218.6       PEAK FLOW RATE(CFS) =     433.67

****************************************************************************
  FLOW PROCESS FROM NODE  13205.00 TO NODE  13206.00 IS CODE =  56
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    692.52  DOWNSTREAM(FEET) =    605.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2704.69   CHANNEL SLOPE =  0.0323
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.129
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      163.73      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     571.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.08
  AVERAGE FLOW DEPTH(FEET) =   3.16   TRAVEL TIME(MIN.) =   4.07
  Tc(MIN.) =   21.37
  SUBAREA AREA(ACRES) =   163.73       SUBAREA RUNOFF(CFS) =  275.85
  EFFECTIVE AREA(ACRES) =    382.30     AREA-AVERAGED Fm(INCH/HR) =   0.23
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.76
  TOTAL AREA(ACRES) =      382.3         PEAK FLOW RATE(CFS) =     654.17
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.39   FLOW VELOCITY(FEET/SEC.) =  11.50
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13206.00 =    8579.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13206.00 TO NODE  13207.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.24  DOWNSTREAM(FEET) =    555.41
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2479.15   CHANNEL SLOPE =  0.0201
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.18
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.921
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      143.41      0.30     0.888     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.888
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     761.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.08
  AVERAGE FLOW DEPTH(FEET) =   4.13   TRAVEL TIME(MIN.) =   4.10
  Tc(MIN.) =   25.47
  SUBAREA AREA(ACRES) =   143.41       SUBAREA RUNOFF(CFS) =  213.59
  EFFECTIVE AREA(ACRES) =    525.71     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =      525.7         PEAK FLOW RATE(CFS) =     796.13
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.22   FLOW VELOCITY(FEET/SEC.) =  10.22
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13207.00 =   11058.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    555.41  DOWNSTREAM(FEET) =    505.65
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1734.55   CHANNEL SLOPE =  0.0287
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.09
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.824
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      123.56      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     883.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.96
  AVERAGE FLOW DEPTH(FEET) =   4.07   TRAVEL TIME(MIN.) =   2.42
  Tc(MIN.) =   27.89
  SUBAREA AREA(ACRES) =   123.56       SUBAREA RUNOFF(CFS) =  174.27
  EFFECTIVE AREA(ACRES) =    649.27     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =      649.3         PEAK FLOW RATE(CFS) =     924.65
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.17   FLOW VELOCITY(FEET/SEC.) =  12.10
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13207.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.89
  RAINFALL INTENSITY(INCH/HR) =   1.82
  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.81
  EFFECTIVE STREAM AREA(ACRES) =     649.27
  TOTAL STREAM AREA(ACRES) =     649.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     924.65

****************************************************************************
  FLOW PROCESS FROM NODE  13210.00 TO NODE  13211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   314.51
  ELEVATION DATA: UPSTREAM(FEET) =    949.80  DOWNSTREAM(FEET) =    828.64

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.525
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.713
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  NATURAL FAIR COVER
  "OPEN BRUSH"                -       1.96      0.30     1.000     0    8.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      6.02
  TOTAL AREA(ACRES) =      1.96   PEAK FLOW RATE(CFS) =      6.02

****************************************************************************
  FLOW PROCESS FROM NODE  13211.00 TO NODE  13212.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    828.64  DOWNSTREAM(FEET) =    767.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   652.49   CHANNEL SLOPE =  0.0930
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.111
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.95      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.22
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   2.58
  Tc(MIN.) =   11.10
  SUBAREA AREA(ACRES) =    11.95       SUBAREA RUNOFF(CFS) =   30.23
  EFFECTIVE AREA(ACRES) =     13.91     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       13.9         PEAK FLOW RATE(CFS) =      35.19
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   5.04
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13212.00 =     967.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13212.00 TO NODE  13213.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    767.94  DOWNSTREAM(FEET) =    706.43
  CHANNEL LENGTH THRU SUBAREA(FEET) =   967.91   CHANNEL SLOPE =  0.0635
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.717
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.07      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.48
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =   2.94
  Tc(MIN.) =   14.05
  SUBAREA AREA(ACRES) =    27.07       SUBAREA RUNOFF(CFS) =   58.89
  EFFECTIVE AREA(ACRES) =     40.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.0         PEAK FLOW RATE(CFS) =      89.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   6.07
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13213.00 =    1934.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13213.00 TO NODE  13214.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    706.43  DOWNSTREAM(FEET) =    659.31
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.11   CHANNEL SLOPE =  0.0497
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.456
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.09      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     106.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.91
  AVERAGE FLOW DEPTH(FEET) =   1.41   TRAVEL TIME(MIN.) =   2.67
  Tc(MIN.) =   16.72
  SUBAREA AREA(ACRES) =    18.09       SUBAREA RUNOFF(CFS) =   35.10
  EFFECTIVE AREA(ACRES) =     59.07     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       59.1         PEAK FLOW RATE(CFS) =     114.63
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.47   FLOW VELOCITY(FEET/SEC.) =   6.04
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13214.00 =    2883.02 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13214.00 TO NODE  13215.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    659.31  DOWNSTREAM(FEET) =    628.91
```

```
 CHANNEL LENGTH THRU SUBAREA(FEET) =   970.24   CHANNEL SLOPE =  0.0313
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.242
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       71.42      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     177.11
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.87
 AVERAGE FLOW DEPTH(FEET) =   2.12   TRAVEL TIME(MIN.) =   2.75
 Tc(MIN.) =   19.47
 SUBAREA AREA(ACRES) =    71.42       SUBAREA RUNOFF(CFS) =  124.82
 EFFECTIVE AREA(ACRES) =    130.49     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      130.5         PEAK FLOW RATE(CFS) =     228.06
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.43

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.43   FLOW VELOCITY(FEET/SEC.) =   6.32
 LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13215.00 =    3853.26 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13215.00 TO NODE  13216.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    628.91  DOWNSTREAM(FEET) =    598.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =   922.63   CHANNEL SLOPE =  0.0331
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.57
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.108
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       36.33      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     257.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.68
 AVERAGE FLOW DEPTH(FEET) =   2.55   TRAVEL TIME(MIN.) =   2.30
 Tc(MIN.) =   21.78
 SUBAREA AREA(ACRES) =    36.33       SUBAREA RUNOFF(CFS) =   59.13
 EFFECTIVE AREA(ACRES) =    166.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      166.8         PEAK FLOW RATE(CFS) =     271.50
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.63

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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```
 DEPTH(FEET) =  2.63   FLOW VELOCITY(FEET/SEC.) =   6.77
 LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13216.00 =    4775.89 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13216.00 TO NODE  13217.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    598.39  DOWNSTREAM(FEET) =    568.48
 CHANNEL LENGTH THRU SUBAREA(FEET) =   636.40   CHANNEL SLOPE =  0.0470
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.55
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.038
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       42.51      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     304.76
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.93
 AVERAGE FLOW DEPTH(FEET) =   2.55   TRAVEL TIME(MIN.) =   1.34
 Tc(MIN.) =   23.11
 SUBAREA AREA(ACRES) =    42.51       SUBAREA RUNOFF(CFS) =   66.51
 EFFECTIVE AREA(ACRES) =    209.33     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      209.3         PEAK FLOW RATE(CFS) =     327.54
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.64

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.64   FLOW VELOCITY(FEET/SEC.) =   8.10
 LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13217.00 =    5412.29 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    568.48  DOWNSTREAM(FEET) =    505.65
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1896.50   CHANNEL SLOPE =  0.0331
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.846
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       73.24      0.30     0.951     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.951
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     378.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.44
 AVERAGE FLOW DEPTH(FEET) =   3.13   TRAVEL TIME(MIN.) =   4.25
```

```
  Tc(MIN.) =   27.36
  SUBAREA AREA(ACRES) =    73.24       SUBAREA RUNOFF(CFS) =  102.85
  EFFECTIVE AREA(ACRES) =    282.57     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =      282.6         PEAK FLOW RATE(CFS) =     394.05
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.19   FLOW VELOCITY(FEET/SEC.) =   7.53
  LONGEST FLOWPATH FROM NODE  13210.00 TO NODE  13220.00 =    7308.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13217.00 TO NODE  13220.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.36
  RAINFALL INTENSITY(INCH/HR) =   1.85
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99
  EFFECTIVE STREAM AREA(ACRES) =     282.57
  TOTAL STREAM AREA(ACRES) =     282.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     394.05

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      924.65   27.89    1.824  0.30( 0.24) 0.81     649.3   13200.00
      2      394.05   27.36    1.846  0.30( 0.30) 0.99     282.6   13210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1313.30   27.36    1.846  0.30( 0.26) 0.86     919.5   13210.00
      2     1313.33   27.89    1.824  0.30( 0.26) 0.86     931.8   13200.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1313.33    Tc(MIN.) =    27.89
  EFFECTIVE AREA(ACRES) =     931.84   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      931.8
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13220.00 =   12793.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13220.00 TO NODE  13221.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    505.65  DOWNSTREAM(FEET) =    478.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1949.14   CHANNEL SLOPE =  0.0137
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.729
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      108.50      0.30     0.637     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.637
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1388.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.70
  AVERAGE FLOW DEPTH(FEET) =   5.31   TRAVEL TIME(MIN.) =   2.56
  Tc(MIN.) =   30.45
  SUBAREA AREA(ACRES) =   108.50       SUBAREA RUNOFF(CFS) =  150.15
  EFFECTIVE AREA(ACRES) =   1040.34     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     1040.3         PEAK FLOW RATE(CFS) =    1383.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.29   FLOW VELOCITY(FEET/SEC.) =  12.70
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13221.00 =   14742.35 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1380.23   29.92    1.743  0.30( 0.25) 0.84    1028.0   13210.00
      2     1383.16   30.45    1.729  0.30( 0.25) 0.84    1040.3   13200.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1383.16  Tc(MIN.) =   30.45
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =    1040.34

****************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    478.94  DOWNSTREAM(FEET) =    427.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2078.70   CHANNEL SLOPE =  0.0247
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.674
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       87.26      0.30     0.699     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.699
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1440.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.94
```

```
 AVERAGE FLOW DEPTH(FEET) =   4.67   TRAVEL TIME(MIN.) =   2.17
 Tc(MIN.) =   32.62
 SUBAREA AREA(ACRES) =    87.26       SUBAREA RUNOFF(CFS) =  114.98
 EFFECTIVE AREA(ACRES) =   1127.60     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
 TOTAL AREA(ACRES) =     1127.6         PEAK FLOW RATE(CFS) =    1446.65
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.68

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.68   FLOW VELOCITY(FEET/SEC.) =  15.96
 LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1444.26   32.09    1.687  0.30( 0.25) 0.83    1115.3   13210.00
     2     1446.65   32.62    1.674  0.30( 0.25) 0.83    1127.6   13200.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1446.65  Tc(MIN.) =   32.62
 AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.83  EFFECTIVE AREA(ACRES) =    1127.60
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     1127.6  TC(MIN.) =     32.62
 EFFECTIVE AREA(ACRES) =   1127.60  AREA-AVERAGED Fm(INCH/HR)=  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.828
 PEAK FLOW RATE(CFS)   =    1446.65

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1444.26   32.09    1.687  0.30( 0.25) 0.83    1115.3   13210.00
     2     1446.65   32.62    1.674  0.30( 0.25) 0.83    1127.6   13200.00
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S33.DAT
  TIME/DATE OF STUDY: 08:14 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.872
   2)   10.00;  3.787
   3)   15.00;  2.932
   4)   20.00;  2.418
   5)   25.00;  2.095
   6)   30.00;  1.872
   7)   40.00;  1.616
   8)   50.00;  1.400
   9)   60.00;  1.290
  10)   90.00;  1.087
  11)  120.00;  0.950
  12)  180.00;  0.794
  13)  360.00;  0.588
  14) 1200.00;  0.256
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S31.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     3200.30   33.81  0.30( 0.24) 0.81    2538.8   13100.00
      2     3223.29   57.47  0.30( 0.24) 0.81    3777.0   13000.00
      3     3119.89   59.67  0.30( 0.24) 0.81    3796.8   13010.00
    TOTAL AREA(ACRES) =     3796.8

**************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S32.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1444.26   32.09  0.30( 0.25) 0.83    1115.3   13210.00
      2     1446.65   32.62  0.30( 0.25) 0.83    1127.6   13200.00
    TOTAL AREA(ACRES) =     1127.6

**************************************************************************
  FLOW PROCESS FROM NODE  13221.00 TO NODE  13222.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1444.26   32.09  0.30( 0.25) 0.83    1115.3   13210.00
      2     1446.65   32.62  0.30( 0.25) 0.83    1127.6   13200.00
    TOTAL AREA(ACRES) =      1127.6

**************************************************************************
  FLOW PROCESS FROM NODE  13112.00 TO NODE  13222.00 IS CODE =  11
--------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1444.26   32.09    1.819  0.30( 0.25) 0.83    1115.3   13210.00
      2     1446.65   32.62    1.805  0.30( 0.25) 0.83    1127.6   13200.00
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3200.30   33.81    1.774  0.30( 0.24) 0.81    2538.8   13100.00
      2     3223.29   57.47    1.318  0.30( 0.24) 0.81    3777.0   13000.00
```

```
     3     3119.89   59.67    1.293  0.30( 0.24) 0.81    3796.8   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4568.86   32.09    1.819  0.30( 0.24) 0.82    3524.7   13210.00
      2     4595.53   32.62    1.805  0.30( 0.24) 0.82    3576.8   13200.00
      3     4618.56   33.81    1.774  0.30( 0.24) 0.82    3666.4   13100.00
      4     4217.03   57.47    1.318  0.30( 0.24) 0.81    4904.6   13000.00
      5     4091.14   59.67    1.293  0.30( 0.24) 0.81    4924.4   13010.00
    TOTAL AREA(ACRES) =      4924.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4618.56  Tc(MIN.) =   33.814
  EFFECTIVE AREA(ACRES) =   3666.44  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4924.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13222.00 =   32126.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13223.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    416.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   864.00   CHANNEL SLOPE =  0.0129
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.89
  CHANNEL FLOW THRU SUBAREA(CFS) =    4618.56
  FLOW VELOCITY(FEET/SEC.) =  11.60   FLOW DEPTH(FEET) =   5.89
  TRAVEL TIME(MIN.) =   1.24   Tc(MIN.) =   35.06
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4891.80   33.34    1.787  0.30( 0.24) 0.82    3524.7   13210.00
      2     4920.81   33.86    1.773  0.30( 0.24) 0.82    3576.8   13200.00
      3     4943.60   35.06    1.743  0.30( 0.24) 0.82    3666.4   13100.00
      4     4678.80   58.74    1.304  0.30( 0.24) 0.81    4904.6   13000.00
      5     4608.15   60.96    1.283  0.30( 0.24) 0.81    4924.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    4943.60  Tc(MIN.) =   35.06
  AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    3666.44

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE = 15.1
----------------------------------------------------------------------------
```



```
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610301Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       82.11   12.18  0.30( 0.30) 1.00      29.3   30100.00
      2       71.26   14.79  0.30( 0.30) 1.00      29.7   30110.00
    TOTAL AREA(ACRES) =       29.7

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13223.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4891.80   33.34    1.787  0.30( 0.24) 0.82    3524.7   13210.00
      2     4920.81   33.86    1.773  0.30( 0.24) 0.82    3576.8   13200.00
      3     4943.60   35.06    1.743  0.30( 0.24) 0.82    3666.4   13100.00
      4     4678.80   58.74    1.304  0.30( 0.24) 0.81    4904.6   13000.00
      5     4608.15   60.96    1.283  0.30( 0.24) 0.81    4924.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       82.11   12.18    3.415  0.30( 0.30) 1.00      29.3   30100.00
      2       71.26   14.79    2.968  0.30( 0.30) 1.00      29.7   30110.00
  LONGEST FLOWPATH FROM NODE  30110.00 TO NODE  13223.00 =    2058.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3755.35   12.18    3.415  0.30( 0.25) 0.82    1316.6   30100.00
      2     3903.82   14.79    2.968  0.30( 0.25) 0.82    1593.2   30110.00
      3     4931.51   33.34    1.787  0.30( 0.25) 0.82    3554.3   13210.00
      4     4960.15   33.86    1.773  0.30( 0.25) 0.82    3606.5   13200.00
      5     4982.13   35.06    1.743  0.30( 0.24) 0.82    3696.1   13100.00
      6     4705.60   58.74    1.304  0.30( 0.24) 0.81    4934.2   13000.00
      7     4634.41   60.96    1.283  0.30( 0.24) 0.81    4954.1   13010.00
    TOTAL AREA(ACRES) =      4954.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4982.13  Tc(MIN.) =   35.056
  EFFECTIVE AREA(ACRES) =   3696.11  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     4954.1
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13223.00 =   32990.49 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13223.00 TO NODE  13224.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    416.40  DOWNSTREAM(FEET) =    410.60
 CHANNEL LENGTH THRU SUBAREA(FEET) =   408.51   CHANNEL SLOPE =  0.0142
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.97
 CHANNEL FLOW THRU SUBAREA(CFS) =    4982.13
 FLOW VELOCITY(FEET/SEC.) =  12.29   FLOW DEPTH(FEET) =   5.97
 TRAVEL TIME(MIN.) =   0.55   Tc(MIN.) =   35.61
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3755.35   12.78    3.312  0.30( 0.25) 0.82    1316.6   30100.00
     2     3903.82   15.39    2.892  0.30( 0.25) 0.82    1593.2   30110.00
     3     4931.51   33.89    1.772  0.30( 0.25) 0.82    3554.3   13210.00
     4     4960.15   34.42    1.759  0.30( 0.25) 0.82    3606.5   13200.00
     5     4982.13   35.61    1.729  0.30( 0.24) 0.82    3696.1   13100.00
     6     4705.60   59.31    1.297  0.30( 0.24) 0.81    4934.2   13000.00
     7     4634.41   61.53    1.280  0.30( 0.24) 0.81    4954.1   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    4982.13  Tc(MIN.) =   35.61
 AREA-AVERAGED Fm(INCH/HR) =  0.24  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.82  EFFECTIVE AREA(ACRES) =    3696.11

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610302Y.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
     1       36.78   10.32  0.30( 0.30) 1.00      11.9   30210.00
     2       36.55   10.65  0.30( 0.30) 1.00      12.0   30200.00
   TOTAL AREA(ACRES) =       12.0

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13224.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3755.35   12.78    3.312  0.30( 0.25) 0.82    1316.6   30100.00
     2     3903.82   15.39    2.892  0.30( 0.25) 0.82    1593.2   30110.00
     3     4931.51   33.89    1.772  0.30( 0.25) 0.82    3554.3   13210.00
     4     4960.15   34.42    1.759  0.30( 0.25) 0.82    3606.5   13200.00
     5     4982.13   35.61    1.729  0.30( 0.24) 0.82    3696.1   13100.00
```



```
     6     4705.60   59.31    1.297  0.30( 0.24) 0.81    4934.2   13000.00
     7     4634.41   61.53    1.280  0.30( 0.24) 0.81    4954.1   13010.00
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       36.78   10.32    3.732  0.30( 0.30) 1.00      11.9   30210.00
     2       36.55   10.65    3.676  0.30( 0.30) 1.00      12.0   30200.00
 LONGEST FLOWPATH FROM NODE  30200.00 TO NODE  13224.00 =    1209.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3486.29   10.32    3.732  0.30( 0.25) 0.82    1075.5   30210.00
     2     3537.81   10.65    3.676  0.30( 0.25) 0.82    1109.1   30200.00
     3     3787.96   12.78    3.312  0.30( 0.25) 0.82    1328.6   30100.00
     4     3931.88   15.39    2.892  0.30( 0.25) 0.82    1605.2   30110.00
     5     4947.44   33.89    1.772  0.30( 0.25) 0.82    3566.4   13210.00
     6     4975.95   34.42    1.759  0.30( 0.25) 0.82    3618.5   13200.00
     7     4997.59   35.61    1.729  0.30( 0.25) 0.82    3708.1   13100.00
     8     4716.40   59.31    1.297  0.30( 0.24) 0.81    4946.3   13000.00
     9     4645.02   61.53    1.280  0.30( 0.24) 0.81    4966.1   13010.00
   TOTAL AREA(ACRES) =      4966.1

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     4997.59  Tc(MIN.) =   35.611
 EFFECTIVE AREA(ACRES) =   3708.14  AREA-AVERAGED Fm(INCH/HR) =  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
 TOTAL AREA(ACRES) =     4966.1
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13224.00 =   33399.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13224.00 TO NODE  13301.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    410.60  DOWNSTREAM(FEET) =    382.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1260.70   CHANNEL SLOPE =  0.0227
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.28
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.691
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       61.66      0.30      0.998     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5036.22
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.50
 AVERAGE FLOW DEPTH(FEET) =   5.28   TRAVEL TIME(MIN.) =   1.45
 Tc(MIN.) =   37.06
 SUBAREA AREA(ACRES) =    61.66       SUBAREA RUNOFF(CFS) =   77.25
 EFFECTIVE AREA(ACRES) =   3769.80     AREA-AVERAGED Fm(INCH/HR) =   0.25
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
 TOTAL AREA(ACRES) =     5027.8         PEAK FLOW RATE(CFS) =    4997.59
```

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.25 FLOW VELOCITY(FEET/SEC.) = 14.46
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3486.29	11.94	3.455	0.30(0.25)	0.83	1137.2	30210.00
2	3537.81	12.26	3.401	0.30(0.25)	0.83	1170.7	30200.00
3	3787.96	14.36	3.042	0.30(0.25)	0.83	1390.3	30100.00
4	3931.88	16.94	2.732	0.30(0.25)	0.83	1666.9	30110.00
5	4947.44	35.35	1.735	0.30(0.25)	0.82	3628.0	13210.00
6	4975.95	35.87	1.722	0.30(0.25)	0.82	3680.1	13200.00
7	4997.59	37.06	1.691	0.30(0.25)	0.82	3769.8	13100.00
8	4716.40	60.79	1.285	0.30(0.24)	0.82	5007.9	13000.00
9	4645.02	63.01	1.269	0.30(0.24)	0.82	5027.8	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 4997.59 Tc(MIN.) = 37.06
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 3769.80

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610303Y.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	317.84	19.93	0.30(0.30)	1.00	166.2	30300.00

TOTAL AREA(ACRES) = 166.2

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3486.29	11.94	3.455	0.30(0.25)	0.83	1137.2	30210.00
2	3537.81	12.26	3.401	0.30(0.25)	0.83	1170.7	30200.00
3	3787.96	14.36	3.042	0.30(0.25)	0.83	1390.3	30100.00
4	3931.88	16.94	2.732	0.30(0.25)	0.83	1666.9	30110.00
5	4947.44	35.35	1.735	0.30(0.25)	0.82	3628.0	13210.00
6	4975.95	35.87	1.722	0.30(0.25)	0.82	3680.1	13200.00
7	4997.59	37.06	1.691	0.30(0.25)	0.82	3769.8	13100.00
8	4716.40	60.79	1.285	0.30(0.24)	0.82	5007.9	13000.00
9	4645.02	63.01	1.269	0.30(0.24)	0.82	5027.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	317.84	19.93	2.425	0.30(0.30)	1.00	166.2	30300.00

LONGEST FLOWPATH FROM NODE 30300.00 TO NODE 13301.00 = 6391.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3769.00	11.94	3.455	0.30(0.25)	0.84	1236.8	30210.00
2	3823.03	12.26	3.401	0.30(0.25)	0.84	1272.9	30200.00
3	4083.34	14.36	3.042	0.30(0.25)	0.84	1510.0	30100.00
4	4241.11	16.94	2.732	0.30(0.25)	0.84	1808.2	30110.00
5	4414.73	19.93	2.425	0.30(0.25)	0.84	2151.8	30300.00
6	5162.14	35.35	1.735	0.30(0.25)	0.83	3794.2	13210.00
7	5188.64	35.87	1.722	0.30(0.25)	0.83	3846.4	13200.00
8	5205.73	37.06	1.691	0.30(0.25)	0.83	3936.0	13100.00
9	4863.68	60.79	1.285	0.30(0.25)	0.82	5174.1	13000.00
10	4790.04	63.01	1.269	0.30(0.25)	0.82	5194.0	13010.00

TOTAL AREA(ACRES) = 5194.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5205.73 Tc(MIN.) = 37.060
EFFECTIVE AREA(ACRES) = 3936.02 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5194.0
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 382.00 DOWNSTREAM(FEET) = 375.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1141.09 CHANNEL SLOPE = 0.0061
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.69
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.639
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.42	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5211.41
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.28
AVERAGE FLOW DEPTH(FEET) = 7.69 TRAVEL TIME(MIN.) = 2.05
Tc(MIN.) = 39.11
SUBAREA AREA(ACRES) = 9.42 SUBAREA RUNOFF(CFS) = 11.35
EFFECTIVE AREA(ACRES) = 3945.44 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5203.4 PEAK FLOW RATE(CFS) = 5205.73
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 7.68 FLOW VELOCITY(FEET/SEC.) = 9.28
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3769.00	14.20	3.070	0.30(0.25)	0.85	1246.2	30210.00
2	3823.03	14.50	3.017	0.30(0.25)	0.85	1282.4	30200.00
3	4083.34	16.56	2.772	0.30(0.25)	0.84	1519.4	30100.00
4	4241.11	19.12	2.508	0.30(0.25)	0.84	1817.6	30110.00
5	4414.73	22.09	2.283	0.30(0.25)	0.84	2161.2	30300.00
6	5162.14	37.40	1.683	0.30(0.25)	0.83	3803.7	13210.00
7	5188.64	37.92	1.669	0.30(0.25)	0.83	3855.8	13200.00
8	5205.73	39.11	1.639	0.30(0.25)	0.83	3945.4	13100.00
9	4863.68	62.88	1.270	0.30(0.25)	0.82	5183.6	13000.00
10	4790.04	65.11	1.255	0.30(0.25)	0.82	5203.4	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 5205.73 Tc(MIN.) = 39.11
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 3945.44

****
FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610214Y.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	390.02	23.32	0.30(0.30)	1.00	227.7	21400.00

TOTAL AREA(ACRES) = 227.7

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3769.00	14.20	3.070	0.30(0.25)	0.85	1246.2	30210.00
2	3823.03	14.50	3.017	0.30(0.25)	0.85	1282.4	30200.00
3	4083.34	16.56	2.772	0.30(0.25)	0.84	1519.4	30100.00
4	4241.11	19.12	2.508	0.30(0.25)	0.84	1817.6	30110.00
5	4414.73	22.09	2.283	0.30(0.25)	0.84	2161.2	30300.00
6	5162.14	37.40	1.683	0.30(0.25)	0.83	3803.7	13210.00
7	5188.64	37.92	1.669	0.30(0.25)	0.83	3855.8	13200.00
8	5205.73	39.11	1.639	0.30(0.25)	0.83	3945.4	13100.00

9	4863.68	62.88	1.270	0.30(0.25)	0.82	5183.6	13000.00
10	4790.04	65.11	1.255	0.30(0.25)	0.82	5203.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	390.02	23.32	2.204	0.30(0.30)	1.00	227.7	21400.00

LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 13302.00 = 6708.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4114.36	14.20	3.070	0.30(0.26)	0.86	1384.7	30210.00
2	4169.17	14.50	3.017	0.30(0.26)	0.86	1423.9	30200.00
3	4442.87	16.56	2.772	0.30(0.26)	0.86	1681.0	30100.00
4	4612.07	19.12	2.508	0.30(0.26)	0.86	2004.2	30110.00
5	4799.56	22.09	2.283	0.30(0.26)	0.85	2376.8	30300.00
6	4865.12	23.32	2.204	0.30(0.26)	0.85	2521.5	21400.00
7	5445.45	37.40	1.683	0.30(0.25)	0.84	4031.3	13210.00
8	5469.23	37.92	1.669	0.30(0.25)	0.84	4083.4	13200.00
9	5480.10	39.11	1.639	0.30(0.25)	0.84	4173.1	13100.00
10	5062.54	62.88	1.270	0.30(0.25)	0.83	5411.2	13000.00
11	4985.81	65.11	1.255	0.30(0.25)	0.83	5431.1	13010.00

TOTAL AREA(ACRES) = 5431.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5480.10 Tc(MIN.) = 39.110
EFFECTIVE AREA(ACRES) = 4173.09 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 5431.1
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13303.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 375.00 DOWNSTREAM(FEET) = 355.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2193.96 CHANNEL SLOPE = 0.0091
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.10
CHANNEL FLOW THRU SUBAREA(CFS) = 5480.10
FLOW VELOCITY(FEET/SEC.) = 10.83 FLOW DEPTH(FEET) = 7.10
TRAVEL TIME(MIN.) = 3.38 Tc(MIN.) = 42.49
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4114.36	17.88	2.636	0.30(0.26)	0.86	1384.7	30210.00
2	4169.17	18.17	2.606	0.30(0.26)	0.86	1423.9	30200.00
3	4442.87	20.16	2.408	0.30(0.26)	0.86	1681.0	30100.00
4	4612.07	22.68	2.245	0.30(0.26)	0.86	2004.2	30110.00
5	4799.56	25.60	2.069	0.30(0.26)	0.85	2376.8	30300.00
6	4865.12	26.82	2.014	0.30(0.26)	0.85	2521.5	21400.00

```
      7     5445.45   40.79    1.599  0.30( 0.25) 0.84    4031.3   13210.00
      8     5469.23   41.30    1.588  0.30( 0.25) 0.84    4083.4   13200.00
      9     5480.10   42.49    1.562  0.30( 0.25) 0.84    4173.1   13100.00
     10     5062.54   66.34    1.247  0.30( 0.25) 0.83    5411.2   13000.00
     11     4985.81   68.59    1.232  0.30( 0.25) 0.83    5431.1   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    5480.10  Tc(MIN.) =   42.49
  AREA-AVERAGED Fm(INCH/HR) =  0.25  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.84  EFFECTIVE AREA(ACRES) =    4173.09

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610213Y.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      230.59   15.23  0.30( 0.30) 1.00      98.2   21300.00
    TOTAL AREA(ACRES) =       98.2

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4114.36   17.88    2.636  0.30( 0.26) 0.86    1384.7   30210.00
      2     4169.17   18.17    2.606  0.30( 0.26) 0.86    1423.9   30200.00
      3     4442.87   20.16    2.408  0.30( 0.26) 0.86    1681.0   30100.00
      4     4612.07   22.68    2.245  0.30( 0.26) 0.86    2004.2   30110.00
      5     4799.56   25.60    2.069  0.30( 0.26) 0.85    2376.8   30300.00
      6     4865.12   26.82    2.014  0.30( 0.26) 0.85    2521.5   21400.00
      7     5445.45   40.79    1.599  0.30( 0.25) 0.84    4031.3   13210.00
      8     5469.23   41.30    1.588  0.30( 0.25) 0.84    4083.4   13200.00
      9     5480.10   42.49    1.562  0.30( 0.25) 0.84    4173.1   13100.00
     10     5062.54   66.34    1.247  0.30( 0.25) 0.83    5411.2   13000.00
     11     4985.81   68.59    1.232  0.30( 0.25) 0.83    5431.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      230.59   15.23    2.909  0.30( 0.30) 1.00      98.2   21300.00
  LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  13303.00 =    2988.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4136.31   15.23    2.909  0.30( 0.26) 0.87    1277.7   21300.00
      2     4320.88   17.88    2.636  0.30( 0.26) 0.87    1483.0   30210.00
      3     4373.02   18.17    2.606  0.30( 0.26) 0.87    1522.1   30200.00
      4     4629.21   20.16    2.408  0.30( 0.26) 0.87    1779.2   30100.00
      5     4784.01   22.68    2.245  0.30( 0.26) 0.86    2102.5   30110.00
      6     4955.88   25.60    2.069  0.30( 0.26) 0.86    2475.0   30300.00
      7     5016.61   26.82    2.014  0.30( 0.26) 0.86    2619.7   21400.00
      8     5560.28   40.79    1.599  0.30( 0.25) 0.84    4129.5   13210.00
      9     5583.08   41.30    1.588  0.30( 0.25) 0.84    4181.7   13200.00
     10     5591.68   42.49    1.562  0.30( 0.25) 0.84    4271.3   13100.00
     11     5146.25   66.34    1.247  0.30( 0.25) 0.83    5509.4   13000.00
     12     5068.18   68.59    1.232  0.30( 0.25) 0.83    5529.3   13010.00
    TOTAL AREA(ACRES) =      5529.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5591.68  Tc(MIN.) =   42.486
  EFFECTIVE AREA(ACRES) =   4271.32  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5529.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13304.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    355.00  DOWNSTREAM(FEET) =    350.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   925.40   CHANNEL SLOPE =  0.0054
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.27
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.525
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       13.84      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5599.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.06
  AVERAGE FLOW DEPTH(FEET) =   8.27   TRAVEL TIME(MIN.) =   1.70
  Tc(MIN.) =   44.19
  SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =   15.26
  EFFECTIVE AREA(ACRES) =   4285.16     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     5543.1          PEAK FLOW RATE(CFS) =    5591.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   8.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  8.26   FLOW VELOCITY(FEET/SEC.) =   9.06
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.15 FEET.

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4136.31	17.08	2.718	0.30(0.26)	0.87	1291.5	21300.00
2	4320.88	19.71	2.448	0.30(0.26)	0.87	1496.8	30210.00
3	4373.02	20.00	2.418	0.30(0.26)	0.87	1536.0	30200.00
4	4629.21	21.95	2.292	0.30(0.26)	0.87	1793.0	30100.00
5	4784.01	24.46	2.130	0.30(0.26)	0.86	2116.3	30110.00
6	4955.88	27.36	1.990	0.30(0.26)	0.86	2488.8	30300.00
7	5016.61	28.58	1.935	0.30(0.26)	0.86	2633.6	21400.00
8	5560.28	42.49	1.562	0.30(0.25)	0.84	4143.4	13210.00
9	5583.08	43.00	1.551	0.30(0.25)	0.84	4195.5	13200.00
10	5591.68	44.19	1.525	0.30(0.25)	0.84	4285.2	13100.00
11	5146.25	68.08	1.235	0.30(0.25)	0.83	5523.3	13000.00
12	5068.18	70.34	1.220	0.30(0.25)	0.83	5543.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 5591.68 Tc(MIN.) = 44.19
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 4285.16

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==========

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610304Y.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	345.08	17.98	0.30(0.30)	1.00	164.9	30410.00
2	320.50	22.62	0.30(0.30)	1.00	182.7	30400.00

TOTAL AREA(ACRES) = 182.7

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4136.31	17.08	2.718	0.30(0.26)	0.87	1291.5	21300.00
2	4320.88	19.71	2.448	0.30(0.26)	0.87	1496.8	30210.00
3	4373.02	20.00	2.418	0.30(0.26)	0.87	1536.0	30200.00
4	4629.21	21.95	2.292	0.30(0.26)	0.87	1793.0	30100.00
5	4784.01	24.46	2.130	0.30(0.26)	0.86	2116.3	30110.00
6	4955.88	27.36	1.990	0.30(0.26)	0.86	2488.8	30300.00
7	5016.61	28.58	1.935	0.30(0.26)	0.86	2633.6	21400.00
8	5560.28	42.49	1.562	0.30(0.25)	0.84	4143.4	13210.00
9	5583.08	43.00	1.551	0.30(0.25)	0.84	4195.5	13200.00
10	5591.68	44.19	1.525	0.30(0.25)	0.84	4285.2	13100.00
11	5146.25	68.08	1.235	0.30(0.25)	0.83	5523.3	13000.00

12	5068.18	70.34	1.220	0.30(0.25)	0.83	5543.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	345.08	17.98	2.625	0.30(0.30)	1.00	164.9	30410.00
2	320.50	22.62	2.249	0.30(0.30)	1.00	182.7	30400.00

LONGEST FLOWPATH FROM NODE 30400.00 TO NODE 13304.00 = 5899.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4477.17	17.08	2.718	0.30(0.27)	0.89	1448.2	21300.00
2	4544.44	17.98	2.625	0.30(0.27)	0.89	1526.5	30410.00
3	4656.79	19.71	2.448	0.30(0.27)	0.88	1668.3	30210.00
4	4707.41	20.00	2.418	0.30(0.27)	0.88	1708.6	30200.00
5	4953.22	21.95	2.292	0.30(0.26)	0.88	1973.2	30100.00
6	4990.62	22.62	2.249	0.30(0.26)	0.88	2061.2	30400.00
7	5084.93	24.46	2.130	0.30(0.26)	0.87	2299.0	30110.00
8	5233.74	27.36	1.990	0.30(0.26)	0.87	2671.5	30300.00
9	5285.52	28.58	1.935	0.30(0.26)	0.87	2816.3	21400.00
10	5767.82	42.49	1.562	0.30(0.25)	0.85	4326.1	13210.00
11	5788.80	43.00	1.551	0.30(0.25)	0.85	4378.2	13200.00
12	5793.18	44.19	1.525	0.30(0.25)	0.85	4467.9	13100.00
13	5300.04	68.08	1.235	0.30(0.25)	0.84	5706.0	13000.00
14	5219.47	70.34	1.220	0.30(0.25)	0.84	5725.8	13010.00

TOTAL AREA(ACRES) = 5725.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 5793.18 Tc(MIN.) = 44.189
EFFECTIVE AREA(ACRES) = 4467.86 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 5725.8
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13305.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 350.00 DOWNSTREAM(FEET) = 315.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.27 CHANNEL SLOPE = 0.0118
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.83
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.437
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5807.19
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.06
AVERAGE FLOW DEPTH(FEET) = 6.83 TRAVEL TIME(MIN.) = 4.10
Tc(MIN.) = 48.29

SUBAREA AREA(ACRES) = 27.39 SUBAREA RUNOFF(CFS) = 28.02
EFFECTIVE AREA(ACRES) = 4495.25 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 5753.2 PEAK FLOW RATE(CFS) = 5793.18
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.82 FLOW VELOCITY(FEET/SEC.) = 12.05
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4477.17	21.51	2.320	0.30(0.27)	0.89	1475.6	21300.00
2	4544.44	22.39	2.264	0.30(0.27)	0.89	1553.9	30410.00
3	4656.79	24.09	2.154	0.30(0.27)	0.89	1695.7	30210.00
4	4707.41	24.36	2.137	0.30(0.27)	0.89	1736.0	30200.00
5	4953.22	26.25	2.040	0.30(0.26)	0.88	2000.6	30100.00
6	4990.62	26.90	2.010	0.30(0.26)	0.88	2088.6	30400.00
7	5084.93	28.72	1.929	0.30(0.26)	0.88	2326.4	30110.00
8	5233.74	31.59	1.831	0.30(0.26)	0.87	2698.9	30300.00
9	5285.52	32.79	1.801	0.30(0.26)	0.87	2843.7	21400.00
10	5767.82	46.60	1.473	0.30(0.26)	0.85	4353.5	13210.00
11	5788.80	47.10	1.462	0.30(0.25)	0.85	4405.6	13200.00
12	5793.18	48.29	1.437	0.30(0.25)	0.85	4495.3	13100.00
13	5300.04	72.29	1.207	0.30(0.25)	0.84	5733.4	13000.00
14	5219.47	74.57	1.191	0.30(0.25)	0.84	5753.2	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 5793.18 Tc(MIN.) = 48.29
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.85 EFFECTIVE AREA(ACRES) = 4495.25

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610305Y.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	980.82	21.64	0.30(0.30)	1.00	541.6	30520.00
2	978.86	23.00	0.30(0.30)	1.00	565.1	30540.00
3	953.22	24.33	0.30(0.30)	1.00	576.1	30510.00
4	923.92	25.76	0.30(0.30)	1.00	582.8	30500.00

TOTAL AREA(ACRES) = 582.8

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4477.17	21.51	2.320	0.30(0.27)	0.89	1475.6	21300.00
2	4544.44	22.39	2.264	0.30(0.27)	0.89	1553.9	30410.00
3	4656.79	24.09	2.154	0.30(0.27)	0.89	1695.7	30210.00
4	4707.41	24.36	2.137	0.30(0.27)	0.89	1736.0	30200.00
5	4953.22	26.25	2.040	0.30(0.26)	0.88	2000.6	30100.00
6	4990.62	26.90	2.010	0.30(0.26)	0.88	2088.6	30400.00
7	5084.93	28.72	1.929	0.30(0.26)	0.88	2326.4	30110.00
8	5233.74	31.59	1.831	0.30(0.26)	0.87	2698.9	30300.00
9	5285.52	32.79	1.801	0.30(0.26)	0.87	2843.7	21400.00
10	5767.82	46.60	1.473	0.30(0.26)	0.85	4353.5	13210.00
11	5788.80	47.10	1.462	0.30(0.25)	0.85	4405.6	13200.00
12	5793.18	48.29	1.437	0.30(0.25)	0.85	4495.3	13100.00
13	5300.04	72.29	1.207	0.30(0.25)	0.84	5733.4	13000.00
14	5219.47	74.57	1.191	0.30(0.25)	0.84	5753.2	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	980.82	21.64	2.312	0.30(0.30)	1.00	541.6	30520.00
2	978.86	23.00	2.225	0.30(0.30)	1.00	565.1	30540.00
3	953.22	24.33	2.139	0.30(0.30)	1.00	576.1	30510.00
4	923.92	25.76	2.061	0.30(0.30)	1.00	582.8	30500.00

LONGEST FLOWPATH FROM NODE 30500.00 TO NODE 13305.00 = 9458.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5456.28	21.51	2.320	0.30(0.28)	0.92	2014.1	21300.00
2	5467.38	21.64	2.312	0.30(0.28)	0.92	2028.1	30520.00
3	5524.18	22.39	2.264	0.30(0.28)	0.92	2108.6	30410.00
4	5563.43	23.00	2.225	0.30(0.28)	0.92	2169.7	30540.00
5	5614.68	24.09	2.154	0.30(0.27)	0.92	2269.8	30210.00
6	5654.95	24.33	2.139	0.30(0.27)	0.91	2307.6	30510.00
7	5660.00	24.36	2.137	0.30(0.27)	0.91	2312.2	30200.00
8	5813.52	25.76	2.061	0.30(0.27)	0.91	2515.0	30500.00
9	5865.70	26.25	2.040	0.30(0.27)	0.91	2583.4	30100.00
10	5887.75	26.90	2.010	0.30(0.27)	0.91	2671.4	30400.00
11	5939.48	28.72	1.929	0.30(0.27)	0.90	2909.2	30110.00
12	6037.05	31.59	1.831	0.30(0.27)	0.89	3281.8	30300.00
13	6072.62	32.79	1.801	0.30(0.27)	0.89	3426.5	21400.00
14	6383.25	46.60	1.473	0.30(0.26)	0.87	4936.3	13210.00
15	6398.49	47.10	1.462	0.30(0.26)	0.87	4988.4	13200.00
16	6389.38	48.29	1.437	0.30(0.26)	0.87	5078.1	13100.00
17	5775.74	72.29	1.207	0.30(0.26)	0.85	6316.2	13000.00
18	5687.09	74.57	1.191	0.30(0.26)	0.85	6336.1	13010.00

TOTAL AREA(ACRES) = 6336.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 6398.49 Tc(MIN.) = 47.102
EFFECTIVE AREA(ACRES) = 4988.44 AREA-AVERAGED Fm(INCH/HR) = 0.26

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90
TOTAL AREA(ACRES) = 6336.1
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.20 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 315.00 DOWNSTREAM(FEET) = 284.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1317.91 CHANNEL SLOPE = 0.0235
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 5.96
CHANNEL FLOW THRU SUBAREA(CFS) = 6398.49
FLOW VELOCITY(FEET/SEC.) = 15.80 FLOW DEPTH(FEET) = 5.96
TRAVEL TIME(MIN.) = 1.39 Tc(MIN.) = 48.49
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5456.28	22.98	2.226	0.30(0.28)	0.92	2014.1	21300.00
2	5467.38	23.09	2.218	0.30(0.28)	0.92	2028.1	30520.00
3	5524.18	23.85	2.170	0.30(0.28)	0.92	2108.6	30410.00
4	5563.43	24.45	2.131	0.30(0.28)	0.92	2169.7	30540.00
5	5614.68	25.53	2.071	0.30(0.27)	0.92	2269.8	30210.00
6	5654.95	25.77	2.061	0.30(0.27)	0.91	2307.6	30510.00
7	5660.00	25.80	2.059	0.30(0.27)	0.91	2312.2	30200.00
8	5813.52	27.19	1.998	0.30(0.27)	0.91	2515.0	30500.00
9	5865.70	27.68	1.976	0.30(0.27)	0.91	2583.4	30100.00
10	5887.75	28.33	1.947	0.30(0.27)	0.91	2671.4	30400.00
11	5939.48	30.14	1.868	0.30(0.27)	0.90	2909.2	30110.00
12	6037.05	33.00	1.795	0.30(0.27)	0.89	3281.8	30300.00
13	6072.62	34.21	1.764	0.30(0.27)	0.89	3426.5	21400.00
14	6383.25	47.99	1.443	0.30(0.26)	0.87	4936.3	13210.00
15	6398.49	48.49	1.432	0.30(0.26)	0.87	4988.4	13200.00
16	6389.38	49.68	1.406	0.30(0.26)	0.87	5078.1	13100.00
17	5775.74	73.72	1.197	0.30(0.26)	0.85	6316.2	13000.00
18	5687.09	76.01	1.182	0.30(0.26)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 6398.49 Tc(MIN.) = 48.49
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 4988.44

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==
PEAK FLOWRATE TABLE FILE NAME: 0610306Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	84.17	18.06	0.30(0.30)	1.00	40.4	30600.00

TOTAL AREA(ACRES) = 40.4

****
FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5456.28	22.98	2.226	0.30(0.28)	0.92	2014.1	21300.00
2	5467.38	23.09	2.218	0.30(0.28)	0.92	2028.1	30520.00
3	5524.18	23.85	2.170	0.30(0.28)	0.92	2108.6	30410.00
4	5563.43	24.45	2.131	0.30(0.28)	0.92	2169.7	30540.00
5	5614.68	25.53	2.071	0.30(0.27)	0.92	2269.8	30210.00
6	5654.95	25.77	2.061	0.30(0.27)	0.91	2307.6	30510.00
7	5660.00	25.80	2.059	0.30(0.27)	0.91	2312.2	30200.00
8	5813.52	27.19	1.998	0.30(0.27)	0.91	2515.0	30500.00
9	5865.70	27.68	1.976	0.30(0.27)	0.91	2583.4	30100.00
10	5887.75	28.33	1.947	0.30(0.27)	0.91	2671.4	30400.00
11	5939.48	30.14	1.868	0.30(0.27)	0.90	2909.2	30110.00
12	6037.05	33.00	1.795	0.30(0.27)	0.89	3281.8	30300.00
13	6072.62	34.21	1.764	0.30(0.27)	0.89	3426.5	21400.00
14	6383.25	47.99	1.443	0.30(0.26)	0.87	4936.3	13210.00
15	6398.49	48.49	1.432	0.30(0.26)	0.87	4988.4	13200.00
16	6389.38	49.68	1.406	0.30(0.26)	0.87	5078.1	13100.00
17	5775.74	73.72	1.197	0.30(0.26)	0.85	6316.2	13000.00
18	5687.09	76.01	1.182	0.30(0.26)	0.85	6336.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	84.17	18.06	2.618	0.30(0.30)	1.00	40.4	30600.00

LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 = 2948.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5233.75	18.06	2.618	0.30(0.28)	0.92	1623.2	30600.00
2	5526.22	22.98	2.226	0.30(0.28)	0.92	2054.4	21300.00
3	5537.03	23.09	2.218	0.30(0.28)	0.92	2068.4	30520.00
4	5592.08	23.85	2.170	0.30(0.28)	0.92	2148.9	30410.00
5	5629.92	24.45	2.131	0.30(0.28)	0.92	2210.1	30540.00
6	5679.01	25.53	2.071	0.30(0.27)	0.92	2310.2	30210.00
7	5718.89	25.77	2.061	0.30(0.27)	0.92	2347.9	30510.00
8	5723.89	25.80	2.059	0.30(0.27)	0.92	2352.6	30200.00
9	5875.16	27.19	1.998	0.30(0.27)	0.91	2555.3	30500.00
10	5926.55	27.68	1.976	0.30(0.27)	0.91	2623.8	30100.00
11	5947.55	28.33	1.947	0.30(0.27)	0.91	2711.8	30400.00
12	5996.44	30.14	1.868	0.30(0.27)	0.90	2949.6	30110.00
13	6091.35	33.00	1.795	0.30(0.27)	0.90	3322.1	30300.00
14	6125.80	34.21	1.764	0.30(0.27)	0.89	3466.9	21400.00

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    15     6424.76   47.99    1.443  0.30( 0.26) 0.87    4976.7   13210.00
    16     6439.60   48.49    1.432  0.30( 0.26) 0.87    5028.8   13200.00
    17     6429.56   49.68    1.406  0.30( 0.26) 0.87    5118.4   13100.00
    18     5808.32   73.72    1.197  0.30( 0.26) 0.86    6356.6   13000.00
    19     5719.11   76.01    1.182  0.30( 0.26) 0.85    6376.4   13010.00
   TOTAL AREA(ACRES) =      6376.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     6439.60  Tc(MIN.) =   48.492
  EFFECTIVE AREA(ACRES) =   5028.79  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =     6376.4
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.20 =   43204.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.20 TO NODE  13305.40 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    284.00  DOWNSTREAM(FEET) =    274.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   826.37   CHANNEL SLOPE =  0.0121
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.17
  CHANNEL FLOW THRU SUBAREA(CFS) =    6439.60
  FLOW VELOCITY(FEET/SEC.) =  12.55   FLOW DEPTH(FEET) =   7.17
  TRAVEL TIME(MIN.) =   1.10   Tc(MIN.) =   49.59
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5233.75   19.22    2.498  0.30( 0.28) 0.92    1623.2   30600.00
      2     5526.22   24.12    2.152  0.30( 0.28) 0.92    2054.4   21300.00
      3     5537.03   24.24    2.144  0.30( 0.28) 0.92    2068.4   30520.00
      4     5592.08   24.99    2.096  0.30( 0.28) 0.92    2148.9   30410.00
      5     5629.92   25.59    2.069  0.30( 0.28) 0.92    2210.1   30540.00
      6     5679.01   26.67    2.021  0.30( 0.27) 0.92    2310.2   30210.00
      7     5718.89   26.91    2.010  0.30( 0.27) 0.92    2347.9   30510.00
      8     5723.89   26.94    2.009  0.30( 0.27) 0.92    2352.6   30200.00
      9     5875.16   28.32    1.947  0.30( 0.27) 0.91    2555.3   30500.00
     10     5926.55   28.80    1.926  0.30( 0.27) 0.91    2623.8   30100.00
     11     5947.55   29.45    1.897  0.30( 0.27) 0.91    2711.8   30400.00
     12     5996.44   31.26    1.840  0.30( 0.27) 0.90    2949.6   30110.00
     13     6091.35   34.12    1.767  0.30( 0.27) 0.90    3322.1   30300.00
     14     6125.80   35.32    1.736  0.30( 0.27) 0.89    3466.9   21400.00
     15     6424.76   49.09    1.419  0.30( 0.26) 0.87    4976.7   13210.00
     16     6439.60   49.59    1.408  0.30( 0.26) 0.87    5028.8   13200.00
     17     6429.56   50.78    1.391  0.30( 0.26) 0.87    5118.4   13100.00
     18     5808.32   74.85    1.190  0.30( 0.26) 0.86    6356.6   13000.00
     19     5719.11   77.15    1.174  0.30( 0.26) 0.85    6376.4   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    6439.60  Tc(MIN.) =   49.59
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    5028.79

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  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610307Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      210.43   17.39  0.30( 0.30) 1.00      98.0   30700.00
    TOTAL AREA(ACRES) =       98.0

****************************************************************************
  FLOW PROCESS FROM NODE  13305.40 TO NODE  13305.40 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5233.75   19.22    2.498  0.30( 0.28) 0.92    1623.2   30600.00
      2     5526.22   24.12    2.152  0.30( 0.28) 0.92    2054.4   21300.00
      3     5537.03   24.24    2.144  0.30( 0.28) 0.92    2068.4   30520.00
      4     5592.08   24.99    2.096  0.30( 0.28) 0.92    2148.9   30410.00
      5     5629.92   25.59    2.069  0.30( 0.28) 0.92    2210.1   30540.00
      6     5679.01   26.67    2.021  0.30( 0.27) 0.92    2310.2   30210.00
      7     5718.89   26.91    2.010  0.30( 0.27) 0.92    2347.9   30510.00
      8     5723.89   26.94    2.009  0.30( 0.27) 0.92    2352.6   30200.00
      9     5875.16   28.32    1.947  0.30( 0.27) 0.91    2555.3   30500.00
     10     5926.55   28.80    1.926  0.30( 0.27) 0.91    2623.8   30100.00
     11     5947.55   29.45    1.897  0.30( 0.27) 0.91    2711.8   30400.00
     12     5996.44   31.26    1.840  0.30( 0.27) 0.90    2949.6   30110.00
     13     6091.35   34.12    1.767  0.30( 0.27) 0.90    3322.1   30300.00
     14     6125.80   35.32    1.736  0.30( 0.27) 0.89    3466.9   21400.00
     15     6424.76   49.09    1.419  0.30( 0.26) 0.87    4976.7   13210.00
     16     6439.60   49.59    1.408  0.30( 0.26) 0.87    5028.8   13200.00
     17     6429.56   50.78    1.391  0.30( 0.26) 0.87    5118.4   13100.00
     18     5808.32   74.85    1.190  0.30( 0.26) 0.86    6356.6   13000.00
     19     5719.11   77.15    1.174  0.30( 0.26) 0.85    6376.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.40 =   44030.70 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      210.43   17.39    2.686  0.30( 0.30) 1.00      98.0   30700.00
  LONGEST FLOWPATH FROM NODE  30700.00 TO NODE  13305.40 =    5192.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5346.76   17.39    2.686  0.30( 0.28) 0.93    1566.6   30700.00
      2     5427.59   19.22    2.498  0.30( 0.28) 0.93    1721.2   30600.00
```

3	5689.54	24.12	2.152	0.30(0.28)	0.92	2152.4	21300.00
4	5699.68	24.24	2.144	0.30(0.28)	0.92	2166.4	30520.00
5	5750.47	24.99	2.096	0.30(0.28)	0.92	2246.9	30410.00
6	5785.94	25.59	2.069	0.30(0.28)	0.92	2308.1	30540.00
7	5830.76	26.67	2.021	0.30(0.28)	0.92	2408.2	30210.00
8	5869.71	26.91	2.010	0.30(0.28)	0.92	2445.9	30510.00
9	5874.59	26.94	2.009	0.30(0.28)	0.92	2450.6	30200.00
10	6020.43	28.32	1.947	0.30(0.27)	0.91	2653.3	30500.00
11	6069.92	28.80	1.926	0.30(0.27)	0.91	2721.8	30100.00
12	6088.36	29.45	1.897	0.30(0.27)	0.91	2809.8	30400.00
13	6132.23	31.26	1.840	0.30(0.27)	0.91	3047.6	30110.00
14	6220.70	34.12	1.767	0.30(0.27)	0.90	3420.1	30300.00
15	6252.45	35.32	1.736	0.30(0.27)	0.90	3564.9	21400.00
16	6523.48	49.09	1.419	0.30(0.26)	0.87	5074.7	13210.00
17	6537.36	49.59	1.408	0.30(0.26)	0.87	5126.8	13200.00
18	6525.78	50.78	1.391	0.30(0.26)	0.87	5216.4	13100.00
19	5886.78	74.85	1.190	0.30(0.26)	0.86	6454.6	13000.00
20	5796.21	77.15	1.174	0.30(0.26)	0.86	6474.4	13010.00

TOTAL AREA(ACRES) = 6474.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 6537.36 Tc(MIN.) = 49.589
EFFECTIVE AREA(ACRES) = 5126.79 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87
TOTAL AREA(ACRES) = 6474.4
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.60 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 274.00 DOWNSTREAM(FEET) = 258.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 733.85 CHANNEL SLOPE = 0.0218
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.16
CHANNEL FLOW THRU SUBAREA(CFS) = 6537.36
FLOW VELOCITY(FEET/SEC.) = 15.49 FLOW DEPTH(FEET) = 6.16
TRAVEL TIME(MIN.) = 0.79 Tc(MIN.) = 50.38
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5346.76	18.23	2.600	0.30(0.28)	0.93	1566.6	30700.00
2	5427.59	20.06	2.414	0.30(0.28)	0.93	1721.2	30600.00
3	5689.54	24.95	2.099	0.30(0.28)	0.92	2152.4	21300.00
4	5699.68	25.07	2.092	0.30(0.28)	0.92	2166.4	30520.00
5	5750.47	25.81	2.059	0.30(0.28)	0.92	2246.9	30410.00
6	5785.94	26.41	2.032	0.30(0.28)	0.92	2308.1	30540.00
7	5830.76	27.49	1.984	0.30(0.28)	0.92	2408.2	30210.00
8	5869.71	27.73	1.974	0.30(0.28)	0.92	2445.9	30510.00
9	5874.59	27.76	1.972	0.30(0.28)	0.92	2450.6	30200.00
10	6020.43	29.13	1.911	0.30(0.27)	0.91	2653.3	30500.00
11	6069.92	29.61	1.890	0.30(0.27)	0.91	2721.8	30100.00
12	6088.36	30.26	1.865	0.30(0.27)	0.91	2809.8	30400.00

13	6132.23	32.07	1.819	0.30(0.27)	0.91	3047.6	30110.00
14	6220.70	34.92	1.746	0.30(0.27)	0.90	3420.1	30300.00
15	6252.45	36.12	1.715	0.30(0.27)	0.90	3564.9	21400.00
16	6523.48	49.88	1.402	0.30(0.26)	0.87	5074.7	13210.00
17	6537.36	50.38	1.395	0.30(0.26)	0.87	5126.8	13200.00
18	6525.78	51.57	1.382	0.30(0.26)	0.87	5216.4	13100.00
19	5886.78	75.67	1.184	0.30(0.26)	0.86	6454.6	13000.00
20	5796.21	77.97	1.169	0.30(0.26)	0.86	6474.4	13010.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 6537.36 Tc(MIN.) = 50.38
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 5126.79

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610308Y.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	141.62	16.99	0.30(0.30)	1.00	64.8	30800.00

TOTAL AREA(ACRES) = 64.8

****
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5346.76	18.23	2.600	0.30(0.28)	0.93	1566.6	30700.00
2	5427.59	20.06	2.414	0.30(0.28)	0.93	1721.2	30600.00
3	5689.54	24.95	2.099	0.30(0.28)	0.92	2152.4	21300.00
4	5699.68	25.07	2.092	0.30(0.28)	0.92	2166.4	30520.00
5	5750.47	25.81	2.059	0.30(0.28)	0.92	2246.9	30410.00
6	5785.94	26.41	2.032	0.30(0.28)	0.92	2308.1	30540.00
7	5830.76	27.49	1.984	0.30(0.28)	0.92	2408.2	30210.00
8	5869.71	27.73	1.974	0.30(0.28)	0.92	2445.9	30510.00
9	5874.59	27.76	1.972	0.30(0.28)	0.92	2450.6	30200.00
10	6020.43	29.13	1.911	0.30(0.27)	0.91	2653.3	30500.00
11	6069.92	29.61	1.890	0.30(0.27)	0.91	2721.8	30100.00
12	6088.36	30.26	1.865	0.30(0.27)	0.91	2809.8	30400.00
13	6132.23	32.07	1.819	0.30(0.27)	0.91	3047.6	30110.00
14	6220.70	34.92	1.746	0.30(0.27)	0.90	3420.1	30300.00
15	6252.45	36.12	1.715	0.30(0.27)	0.90	3564.9	21400.00
16	6523.48	49.88	1.402	0.30(0.26)	0.87	5074.7	13210.00
17	6537.36	50.38	1.395	0.30(0.26)	0.87	5126.8	13200.00
18	6525.78	51.57	1.382	0.30(0.26)	0.87	5216.4	13100.00

```
    19     5886.78   75.67    1.184  0.30( 0.26) 0.86    6454.6   13000.00
    20     5796.21   77.97    1.169  0.30( 0.26) 0.86    6474.4   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      141.62   16.99    2.728  0.30( 0.30) 1.00      64.8   30800.00
  LONGEST FLOWPATH FROM NODE  30800.00 TO NODE  13305.60 =    4165.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5397.77   16.99    2.728  0.30( 0.28) 0.93    1524.5   30800.00
      2     5480.92   18.23    2.600  0.30( 0.28) 0.93    1631.5   30700.00
      3     5550.93   20.06    2.414  0.30( 0.28) 0.93    1786.0   30600.00
      4     5794.47   24.95    2.099  0.30( 0.28) 0.93    2217.3   21300.00
      5     5804.24   25.07    2.092  0.30( 0.28) 0.93    2231.3   30520.00
      6     5853.09   25.81    2.059  0.30( 0.28) 0.93    2311.7   30410.00
      7     5887.00   26.41    2.032  0.30( 0.28) 0.92    2372.9   30540.00
      8     5929.00   27.49    1.984  0.30( 0.28) 0.92    2473.0   30210.00
      9     5967.34   27.73    1.974  0.30( 0.28) 0.92    2510.8   30510.00
     10     5972.15   27.76    1.972  0.30( 0.28) 0.92    2515.4   30200.00
     11     6114.41   29.13    1.911  0.30( 0.27) 0.92    2718.2   30500.00
     12     6162.65   29.61    1.890  0.30( 0.27) 0.91    2786.6   30100.00
     13     6179.68   30.26    1.865  0.30( 0.27) 0.91    2874.6   30400.00
     14     6220.86   32.07    1.819  0.30( 0.27) 0.91    3112.4   30110.00
     15     6305.07   34.92    1.746  0.30( 0.27) 0.90    3484.9   30300.00
     16     6335.02   36.12    1.715  0.30( 0.27) 0.90    3629.7   21400.00
     17     6587.78   49.88    1.402  0.30( 0.26) 0.87    5139.5   13210.00
     18     6601.27   50.38    1.395  0.30( 0.26) 0.87    5191.6   13200.00
     19     6588.93   51.57    1.382  0.30( 0.26) 0.87    5281.3   13100.00
     20     5938.36   75.67    1.184  0.30( 0.26) 0.86    6519.4   13000.00
     21     5846.88   77.97    1.169  0.30( 0.26) 0.86    6539.3   13010.00
    TOTAL AREA(ACRES) =      6539.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     6601.27  Tc(MIN.) =   50.379
  EFFECTIVE AREA(ACRES) =   5191.62  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.87
  TOTAL AREA(ACRES) =     6539.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.60 =   44764.55 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.60 TO NODE  13305.80 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    258.00  DOWNSTREAM(FEET) =    254.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   947.16   CHANNEL SLOPE =  0.0042
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.62
  CHANNEL FLOW THRU SUBAREA(CFS) =    6601.27
  FLOW VELOCITY(FEET/SEC.) =   8.70   FLOW DEPTH(FEET) =   9.62
  TRAVEL TIME(MIN.) =   1.81   Tc(MIN.) =   52.19
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.80 =   45711.71 FEET.
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5397.77   18.91    2.530  0.30( 0.28) 0.93    1524.5   30800.00
      2     5480.92   20.15    2.409  0.30( 0.28) 0.93    1631.5   30700.00
      3     5550.93   21.97    2.291  0.30( 0.28) 0.93    1786.0   30600.00
      4     5794.47   26.83    2.014  0.30( 0.28) 0.93    2217.3   21300.00
      5     5804.24   26.95    2.008  0.30( 0.28) 0.93    2231.3   30520.00
      6     5853.09   27.69    1.975  0.30( 0.28) 0.93    2311.7   30410.00
      7     5887.00   28.28    1.949  0.30( 0.28) 0.92    2372.9   30540.00
      8     5929.00   29.36    1.901  0.30( 0.28) 0.92    2473.0   30210.00
      9     5967.34   29.59    1.890  0.30( 0.28) 0.92    2510.8   30510.00
     10     5972.15   29.62    1.889  0.30( 0.28) 0.92    2515.4   30200.00
     11     6114.41   30.98    1.847  0.30( 0.27) 0.92    2718.2   30500.00
     12     6162.65   31.46    1.835  0.30( 0.27) 0.91    2786.6   30100.00
     13     6179.68   32.11    1.818  0.30( 0.27) 0.91    2874.6   30400.00
     14     6220.86   33.91    1.772  0.30( 0.27) 0.91    3112.4   30110.00
     15     6305.07   36.76    1.699  0.30( 0.27) 0.90    3484.9   30300.00
     16     6335.02   37.96    1.668  0.30( 0.27) 0.90    3629.7   21400.00
     17     6587.78   51.69    1.381  0.30( 0.26) 0.87    5139.5   13210.00
     18     6601.27   52.19    1.375  0.30( 0.26) 0.87    5191.6   13200.00
     19     6588.93   53.38    1.362  0.30( 0.26) 0.87    5281.3   13100.00
     20     5938.36   77.54    1.171  0.30( 0.26) 0.86    6519.4   13000.00
     21     5846.88   79.84    1.156  0.30( 0.26) 0.86    6539.3   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    6601.27  Tc(MIN.) =   52.19
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.87  EFFECTIVE AREA(ACRES) =    5191.62

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610309Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      145.65   16.70  0.30( 0.30) 1.00      65.9   30900.00
      2      145.49   16.74  0.30( 0.30) 1.00      65.9   30910.00
    TOTAL AREA(ACRES) =       65.9

****************************************************************************
  FLOW PROCESS FROM NODE  13305.80 TO NODE  13305.80 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	5397.77	18.91	2.530	0.30(0.28)	0.93	1524.5	30800.00
2	5480.92	20.15	2.409	0.30(0.28)	0.93	1631.5	30700.00
3	5550.93	21.97	2.291	0.30(0.28)	0.93	1786.0	30600.00
4	5794.47	26.83	2.014	0.30(0.28)	0.93	2217.3	21300.00
5	5804.24	26.95	2.008	0.30(0.28)	0.93	2231.3	30520.00
6	5853.09	27.69	1.975	0.30(0.28)	0.93	2311.7	30410.00
7	5887.00	28.28	1.949	0.30(0.28)	0.92	2372.9	30540.00
8	5929.00	29.36	1.901	0.30(0.28)	0.92	2473.0	30210.00
9	5967.34	29.59	1.890	0.30(0.28)	0.92	2510.8	30510.00
10	5972.15	29.62	1.889	0.30(0.28)	0.92	2515.4	30200.00
11	6114.41	30.98	1.847	0.30(0.27)	0.92	2718.2	30500.00
12	6162.65	31.46	1.835	0.30(0.27)	0.91	2786.6	30100.00
13	6179.68	32.11	1.818	0.30(0.27)	0.91	2874.6	30400.00
14	6220.86	33.91	1.772	0.30(0.27)	0.91	3112.4	30110.00
15	6305.07	36.76	1.699	0.30(0.27)	0.90	3484.9	30300.00
16	6335.02	37.96	1.668	0.30(0.27)	0.90	3629.7	21400.00
17	6587.78	51.69	1.381	0.30(0.26)	0.87	5139.5	13210.00
18	6601.27	52.19	1.375	0.30(0.26)	0.87	5191.6	13200.00
19	6588.93	53.38	1.362	0.30(0.26)	0.87	5281.3	13100.00
20	5938.36	77.54	1.171	0.30(0.26)	0.86	6519.4	13000.00
21	5846.88	79.84	1.156	0.30(0.26)	0.86	6539.3	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	145.65	16.70	2.757	0.30(0.30)	1.00	65.9	30900.00
2	145.49	16.74	2.753	0.30(0.30)	1.00	65.9	30910.00

LONGEST FLOWPATH FROM NODE 30900.00 TO NODE 13305.80 = 3403.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5393.48	16.70	2.757	0.30(0.28)	0.93	1412.3	30900.00
2	5397.52	16.74	2.753	0.30(0.28)	0.93	1415.8	30910.00
3	5530.06	18.91	2.530	0.30(0.28)	0.93	1590.4	30800.00
4	5605.99	20.15	2.409	0.30(0.28)	0.93	1697.4	30700.00
5	5669.04	21.97	2.291	0.30(0.28)	0.93	1852.0	30600.00
6	5896.11	26.83	2.014	0.30(0.28)	0.93	2283.2	21300.00
7	5905.57	26.95	2.008	0.30(0.28)	0.93	2297.2	30520.00
8	5952.46	27.69	1.975	0.30(0.28)	0.93	2377.6	30410.00
9	5984.80	28.28	1.949	0.30(0.28)	0.93	2438.8	30540.00
10	6023.95	29.36	1.901	0.30(0.28)	0.92	2538.9	30210.00
11	6061.67	29.59	1.890	0.30(0.28)	0.92	2576.7	30510.00
12	6066.40	29.62	1.889	0.30(0.28)	0.92	2581.3	30200.00
13	6206.18	30.98	1.847	0.30(0.28)	0.92	2784.1	30500.00
14	6253.69	31.46	1.835	0.30(0.27)	0.92	2852.5	30100.00
15	6269.74	32.11	1.818	0.30(0.27)	0.91	2940.5	30400.00
16	6308.17	33.91	1.772	0.30(0.27)	0.91	3178.3	30110.00
17	6388.07	36.76	1.699	0.30(0.27)	0.90	3550.8	30300.00
18	6416.20	37.96	1.668	0.30(0.27)	0.90	3695.6	21400.00
19	6651.90	51.69	1.381	0.30(0.26)	0.88	5205.4	13210.00
20	6665.06	52.19	1.375	0.30(0.26)	0.87	5257.5	13200.00
21	6651.95	53.38	1.362	0.30(0.26)	0.87	5347.2	13100.00
22	5990.05	77.54	1.171	0.30(0.26)	0.86	6585.3	13000.00
23	5897.65	79.84	1.156	0.30(0.26)	0.86	6605.2	13010.00

TOTAL AREA(ACRES) = 6605.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 6665.06 Tc(MIN.) = 52.192
EFFECTIVE AREA(ACRES) = 5257.54 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90
TOTAL AREA(ACRES) = 6605.2
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

****
FLOW PROCESS FROM NODE 13305.80 TO NODE 13306.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 254.00 DOWNSTREAM(FEET) = 245.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 583.12 CHANNEL SLOPE = 0.0146
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.98
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.368
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.77	0.30	0.998	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6698.12
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.56
AVERAGE FLOW DEPTH(FEET) = 6.97 TRAVEL TIME(MIN.) = 0.72
Tc(MIN.) = 52.91
SUBAREA AREA(ACRES) = 68.77 SUBAREA RUNOFF(CFS) = 66.12
EFFECTIVE AREA(ACRES) = 5326.31 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88
TOTAL AREA(ACRES) = 6673.9 PEAK FLOW RATE(CFS) = 6665.06
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.95 FLOW VELOCITY(FEET/SEC.) = 13.53
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13306.00 = 46294.83 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5393.48	17.46	2.679	0.30(0.28)	0.94	1481.0	30900.00
2	5397.52	17.51	2.674	0.30(0.28)	0.94	1484.6	30910.00
3	5530.06	19.67	2.452	0.30(0.28)	0.93	1659.2	30800.00
4	5605.99	20.90	2.360	0.30(0.28)	0.93	1766.2	30700.00
5	5669.04	22.72	2.243	0.30(0.28)	0.93	1920.7	30600.00
6	5896.11	27.57	1.980	0.30(0.28)	0.93	2352.0	21300.00
7	5905.57	27.69	1.975	0.30(0.28)	0.93	2365.9	30520.00
8	5952.46	28.43	1.942	0.30(0.28)	0.93	2446.4	30410.00
9	5984.80	29.02	1.916	0.30(0.28)	0.93	2507.6	30540.00
10	6023.95	30.10	1.870	0.30(0.28)	0.93	2607.7	30210.00
11	6061.67	30.33	1.864	0.30(0.28)	0.93	2645.4	30510.00
12	6066.40	30.36	1.863	0.30(0.28)	0.93	2650.1	30200.00
13	6206.18	31.71	1.828	0.30(0.28)	0.92	2852.8	30500.00

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     14     6253.69   32.19    1.816  0.30( 0.28) 0.92    2921.3   30100.00
     15     6269.74   32.84    1.800  0.30( 0.27) 0.92    3009.3   30400.00
     16     6308.17   34.64    1.753  0.30( 0.27) 0.91    3247.1   30110.00
     17     6388.07   37.48    1.681  0.30( 0.27) 0.90    3619.6   30300.00
     18     6416.20   38.68    1.650  0.30( 0.27) 0.90    3764.4   21400.00
     19     6651.90   52.41    1.373  0.30( 0.26) 0.88    5274.2   13210.00
     20     6665.06   52.91    1.368  0.30( 0.26) 0.88    5326.3   13200.00
     21     6651.95   54.10    1.355  0.30( 0.26) 0.87    5416.0   13100.00
     22     5990.05   78.28    1.166  0.30( 0.26) 0.86    6654.1   13000.00
     23     5897.65   80.59    1.151  0.30( 0.26) 0.86    6673.9   13010.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    6665.06  Tc(MIN.) =   52.91
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5326.31

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13307.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    245.50  DOWNSTREAM(FEET) =    220.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1543.21   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.72
  CHANNEL FLOW THRU SUBAREA(CFS) =    6665.06
  FLOW VELOCITY(FEET/SEC.) =  14.14   FLOW DEPTH(FEET) =   6.72
  TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   54.73
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5393.48   19.40    2.480  0.30( 0.28) 0.94    1481.0   30900.00
      2     5397.52   19.45    2.475  0.30( 0.28) 0.94    1484.6   30910.00
      3     5530.06   21.59    2.315  0.30( 0.28) 0.93    1659.2   30800.00
      4     5605.99   22.82    2.236  0.30( 0.28) 0.93    1766.2   30700.00
      5     5669.04   24.63    2.119  0.30( 0.28) 0.93    1920.7   30600.00
      6     5896.11   29.46    1.896  0.30( 0.28) 0.93    2352.0   21300.00
      7     5905.57   29.58    1.891  0.30( 0.28) 0.93    2365.9   30520.00
      8     5952.46   30.31    1.864  0.30( 0.28) 0.93    2446.4   30410.00
      9     5984.80   30.90    1.849  0.30( 0.28) 0.93    2507.6   30540.00
     10     6023.95   31.97    1.822  0.30( 0.28) 0.93    2607.7   30210.00
     11     6061.67   32.20    1.816  0.30( 0.28) 0.93    2645.4   30510.00
     12     6066.40   32.23    1.815  0.30( 0.28) 0.93    2650.1   30200.00
     13     6206.18   33.57    1.781  0.30( 0.28) 0.92    2852.8   30500.00
     14     6253.69   34.04    1.769  0.30( 0.28) 0.92    2921.3   30100.00
     15     6269.74   34.69    1.752  0.30( 0.27) 0.92    3009.3   30400.00
     16     6308.17   36.49    1.706  0.30( 0.27) 0.91    3247.1   30110.00
     17     6388.07   39.33    1.633  0.30( 0.27) 0.90    3619.6   30300.00
     18     6416.20   40.52    1.605  0.30( 0.27) 0.90    3764.4   21400.00
     19     6651.90   54.23    1.353  0.30( 0.26) 0.88    5274.2   13210.00
     20     6665.06   54.73    1.348  0.30( 0.26) 0.88    5326.3   13200.00
     21     6651.95   55.92    1.335  0.30( 0.26) 0.87    5416.0   13100.00
     22     5990.05   80.16    1.154  0.30( 0.26) 0.86    6654.1   13000.00
     23     5897.65   82.47    1.138  0.30( 0.26) 0.86    6673.9   13010.00
  NEW PEAK FLOW DATA ARE:
```



```
  PEAK FLOW RATE(CFS) =    6665.06  Tc(MIN.) =   54.73
  AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5326.31

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610310Y.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      182.13   20.79  0.30( 0.30) 1.00      97.9   31000.00
    TOTAL AREA(ACRES) =       97.9

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5393.48   19.40    2.480  0.30( 0.28) 0.94    1481.0   30900.00
      2     5397.52   19.45    2.475  0.30( 0.28) 0.94    1484.6   30910.00
      3     5530.06   21.59    2.315  0.30( 0.28) 0.93    1659.2   30800.00
      4     5605.99   22.82    2.236  0.30( 0.28) 0.93    1766.2   30700.00
      5     5669.04   24.63    2.119  0.30( 0.28) 0.93    1920.7   30600.00
      6     5896.11   29.46    1.896  0.30( 0.28) 0.93    2352.0   21300.00
      7     5905.57   29.58    1.891  0.30( 0.28) 0.93    2365.9   30520.00
      8     5952.46   30.31    1.864  0.30( 0.28) 0.93    2446.4   30410.00
      9     5984.80   30.90    1.849  0.30( 0.28) 0.93    2507.6   30540.00
     10     6023.95   31.97    1.822  0.30( 0.28) 0.93    2607.7   30210.00
     11     6061.67   32.20    1.816  0.30( 0.28) 0.93    2645.4   30510.00
     12     6066.40   32.23    1.815  0.30( 0.28) 0.93    2650.1   30200.00
     13     6206.18   33.57    1.781  0.30( 0.28) 0.92    2852.8   30500.00
     14     6253.69   34.04    1.769  0.30( 0.28) 0.92    2921.3   30100.00
     15     6269.74   34.69    1.752  0.30( 0.27) 0.92    3009.3   30400.00
     16     6308.17   36.49    1.706  0.30( 0.27) 0.91    3247.1   30110.00
     17     6388.07   39.33    1.633  0.30( 0.27) 0.90    3619.6   30300.00
     18     6416.20   40.52    1.605  0.30( 0.27) 0.90    3764.4   21400.00
     19     6651.90   54.23    1.353  0.30( 0.26) 0.88    5274.2   13210.00
     20     6665.06   54.73    1.348  0.30( 0.26) 0.88    5326.3   13200.00
     21     6651.95   55.92    1.335  0.30( 0.26) 0.87    5416.0   13100.00
     22     5990.05   80.16    1.154  0.30( 0.26) 0.86    6654.1   13000.00
     23     5897.65   82.47    1.138  0.30( 0.26) 0.86    6673.9   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      182.13   20.79    2.367  0.30( 0.30) 1.00      97.9   31000.00
LONGEST FLOWPATH FROM NODE  31000.00 TO NODE  13307.00 =    5162.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     5572.69   19.40    2.480  0.30( 0.28) 0.94    1572.4   30900.00
    2     5576.75   19.45    2.475  0.30( 0.28) 0.94    1576.1   30910.00
    3     5662.99   20.79    2.367  0.30( 0.28) 0.94    1692.2   31000.00
    4     5707.66   21.59    2.315  0.30( 0.28) 0.94    1757.0   30800.00
    5     5776.61   22.82    2.236  0.30( 0.28) 0.94    1864.0   30700.00
    6     5829.36   24.63    2.119  0.30( 0.28) 0.94    2018.6   30600.00
    7     6036.78   29.46    1.896  0.30( 0.28) 0.93    2449.8   21300.00
    8     6045.78   29.58    1.891  0.30( 0.28) 0.93    2463.8   30520.00
    9     6090.31   30.31    1.864  0.30( 0.28) 0.93    2544.3   30410.00
   10     6121.32   30.90    1.849  0.30( 0.28) 0.93    2605.4   30540.00
   11     6158.05   31.97    1.822  0.30( 0.28) 0.93    2705.6   30210.00
   12     6195.26   32.20    1.816  0.30( 0.28) 0.93    2743.3   30510.00
   13     6199.92   32.23    1.815  0.30( 0.28) 0.93    2748.0   30200.00
   14     6336.67   33.57    1.781  0.30( 0.28) 0.92    2950.7   30500.00
   15     6383.13   34.04    1.769  0.30( 0.28) 0.92    3019.2   30100.00
   16     6397.72   34.69    1.752  0.30( 0.28) 0.92    3107.2   30400.00
   17     6432.09   36.49    1.706  0.30( 0.27) 0.91    3345.0   30110.00
   18     6505.60   39.33    1.633  0.30( 0.27) 0.91    3717.5   30300.00
   19     6531.22   40.52    1.605  0.30( 0.27) 0.90    3862.3   21400.00
   20     6744.75   54.23    1.353  0.30( 0.26) 0.88    5372.1   13210.00
   21     6757.42   54.73    1.348  0.30( 0.26) 0.88    5424.2   13200.00
   22     6743.15   55.92    1.335  0.30( 0.26) 0.88    5513.8   13100.00
   23     6065.33   80.16    1.154  0.30( 0.26) 0.86    6752.0   13000.00
   24     5971.55   82.47    1.138  0.30( 0.26) 0.86    6771.8   13010.00
  TOTAL AREA(ACRES) =      6771.8

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     6757.42  Tc(MIN.) =   54.728
 EFFECTIVE AREA(ACRES) =   5424.19  AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.88
 TOTAL AREA(ACRES) =     6771.8
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.04 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    220.00  DOWNSTREAM(FEET) =    212.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   925.62   CHANNEL SLOPE =  0.0086
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   8.06
 CHANNEL FLOW THRU SUBAREA(CFS) =    6757.42
 FLOW VELOCITY(FEET/SEC.) =  11.30   FLOW DEPTH(FEET) =   8.06
 TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =   56.09
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     5572.69   20.85    2.363  0.30( 0.28) 0.94    1572.4   30900.00
    2     5576.75   20.89    2.361  0.30( 0.28) 0.94    1576.1   30910.00
    3     5662.99   22.23    2.274  0.30( 0.28) 0.94    1692.2   31000.00
    4     5707.66   23.02    2.223  0.30( 0.28) 0.94    1757.0   30800.00
    5     5776.61   24.25    2.144  0.30( 0.28) 0.94    1864.0   30700.00
    6     5829.36   26.05    2.048  0.30( 0.28) 0.94    2018.6   30600.00
    7     6036.78   30.87    1.850  0.30( 0.28) 0.93    2449.8   21300.00
    8     6045.78   30.99    1.847  0.30( 0.28) 0.93    2463.8   30520.00
    9     6090.31   31.72    1.828  0.30( 0.28) 0.93    2544.3   30410.00
   10     6121.32   32.31    1.813  0.30( 0.28) 0.93    2605.4   30540.00
   11     6158.05   33.38    1.786  0.30( 0.28) 0.93    2705.6   30210.00
   12     6195.26   33.60    1.780  0.30( 0.28) 0.93    2743.3   30510.00
   13     6199.92   33.63    1.779  0.30( 0.28) 0.93    2748.0   30200.00
   14     6336.67   34.96    1.745  0.30( 0.28) 0.92    2950.7   30500.00
   15     6383.13   35.43    1.733  0.30( 0.28) 0.92    3019.2   30100.00
   16     6397.72   36.07    1.717  0.30( 0.28) 0.92    3107.2   30400.00
   17     6432.09   37.88    1.671  0.30( 0.27) 0.91    3345.0   30110.00
   18     6505.60   40.71    1.601  0.30( 0.27) 0.91    3717.5   30300.00
   19     6531.22   41.90    1.575  0.30( 0.27) 0.90    3862.3   21400.00
   20     6744.75   55.59    1.338  0.30( 0.26) 0.88    5372.1   13210.00
   21     6757.42   56.09    1.333  0.30( 0.26) 0.88    5424.2   13200.00
   22     6743.15   57.29    1.320  0.30( 0.26) 0.88    5513.8   13100.00
   23     6065.33   81.57    1.144  0.30( 0.26) 0.86    6752.0   13000.00
   24     5971.55   83.89    1.129  0.30( 0.26) 0.86    6771.8   13010.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    6757.42  Tc(MIN.) =   56.09
 AREA-AVERAGED Fm(INCH/HR) =  0.26  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.88  EFFECTIVE AREA(ACRES) =    5424.19

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610212Y.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      461.14   33.02  0.30( 0.30) 1.00     342.8   21200.00
   TOTAL AREA(ACRES) =      342.8

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     5572.69   20.85    2.363  0.30( 0.28) 0.94    1572.4   30900.00
```

```
     2     5576.75   20.89    2.361  0.30( 0.28) 0.94    1576.1   30910.00
     3     5662.99   22.23    2.274  0.30( 0.28) 0.94    1692.2   31000.00
     4     5707.66   23.02    2.223  0.30( 0.28) 0.94    1757.0   30800.00
     5     5776.61   24.25    2.144  0.30( 0.28) 0.94    1864.0   30700.00
     6     5829.36   26.05    2.048  0.30( 0.28) 0.94    2018.6   30600.00
     7     6036.78   30.87    1.850  0.30( 0.28) 0.93    2449.8   21300.00
     8     6045.78   30.99    1.847  0.30( 0.28) 0.93    2463.8   30520.00
     9     6090.31   31.72    1.828  0.30( 0.28) 0.93    2544.3   30410.00
    10     6121.32   32.31    1.813  0.30( 0.28) 0.93    2605.4   30540.00
    11     6158.05   33.38    1.786  0.30( 0.28) 0.93    2705.6   30210.00
    12     6195.26   33.60    1.780  0.30( 0.28) 0.93    2743.3   30510.00
    13     6199.92   33.63    1.779  0.30( 0.28) 0.93    2748.0   30200.00
    14     6336.67   34.96    1.745  0.30( 0.28) 0.92    2950.7   30500.00
    15     6383.13   35.43    1.733  0.30( 0.28) 0.92    3019.2   30100.00
    16     6397.72   36.07    1.717  0.30( 0.28) 0.92    3107.2   30400.00
    17     6432.09   37.88    1.671  0.30( 0.27) 0.91    3345.0   30110.00
    18     6505.60   40.71    1.601  0.30( 0.27) 0.91    3717.5   30300.00
    19     6531.22   41.90    1.575  0.30( 0.27) 0.90    3862.3   21400.00
    20     6744.75   55.59    1.338  0.30( 0.26) 0.88    5372.1   13210.00
    21     6757.42   56.09    1.333  0.30( 0.26) 0.88    5424.2   13200.00
    22     6743.15   57.29    1.320  0.30( 0.26) 0.88    5513.8   13100.00
    23     6065.33   81.57    1.144  0.30( 0.26) 0.86    6752.0   13000.00
    24     5971.55   83.89    1.129  0.30( 0.26) 0.86    6771.8   13010.00
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      461.14   33.02    1.795  0.30( 0.30) 1.00     342.8   21200.00
LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  13308.00 =   11049.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     5974.58   20.85    2.363  0.30( 0.28) 0.95    1788.8   30900.00
    2     5978.93   20.89    2.361  0.30( 0.28) 0.95    1793.0   30910.00
    3     6073.00   22.23    2.274  0.30( 0.28) 0.95    1923.0   31000.00
    4     6121.29   23.02    2.223  0.30( 0.28) 0.95    1996.1   30800.00
    5     6194.32   24.25    2.144  0.30( 0.28) 0.94    2115.8   30700.00
    6     6254.91   26.05    2.048  0.30( 0.28) 0.94    2289.1   30600.00
    7     6483.78   30.87    1.850  0.30( 0.28) 0.94    2770.3   21300.00
    8     6493.60   30.99    1.847  0.30( 0.28) 0.94    2785.5   30520.00
    9     6543.15   31.72    1.828  0.30( 0.28) 0.94    2873.6   30410.00
   10     6578.01   32.31    1.813  0.30( 0.28) 0.94    2940.8   30540.00
   11     6606.86   33.02    1.795  0.30( 0.28) 0.94    3014.8   21200.00
   12     6616.35   33.38    1.786  0.30( 0.28) 0.94    3048.3   30210.00
   13     6651.79   33.60    1.780  0.30( 0.28) 0.94    3086.1   30510.00
   14     6656.23   33.63    1.779  0.30( 0.28) 0.94    3090.8   30200.00
   15     6782.46   34.96    1.745  0.30( 0.28) 0.93    3293.5   30500.00
   16     6825.22   35.43    1.733  0.30( 0.28) 0.93    3362.0   30100.00
   17     6834.74   36.07    1.717  0.30( 0.28) 0.93    3450.0   30400.00
   18     6854.88   37.88    1.671  0.30( 0.28) 0.92    3687.8   30110.00
   19     6906.91   40.71    1.601  0.30( 0.27) 0.91    4060.3   30300.00
   20     6924.56   41.90    1.575  0.30( 0.27) 0.91    4205.0   21400.00
   21     7065.01   55.59    1.338  0.30( 0.27) 0.89    5714.9   13210.00
   22     7076.00   56.09    1.333  0.30( 0.27) 0.89    5767.0   13200.00
   23     7057.69   57.29    1.320  0.30( 0.27) 0.88    5856.6   13100.00
   24     6325.77   81.57    1.144  0.30( 0.26) 0.87    7094.8   13000.00
```



```
     25     6227.16   83.89    1.129  0.30( 0.26) 0.87    7114.6   13010.00
    TOTAL AREA(ACRES) =      7114.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     7076.00  Tc(MIN.) =   56.093
  EFFECTIVE AREA(ACRES) =   5766.97  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.89
  TOTAL AREA(ACRES) =     7114.6
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S29.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    24432.14   17.97  0.30( 0.30) 0.99    3795.5   50400.00
      2    27926.46   26.98  0.30( 0.30) 0.99    6562.8   31100.00
      3    31501.43   37.09  0.30( 0.30) 0.99   10003.8   50100.00
      4    32271.27   40.79  0.30( 0.30) 0.99   11481.3   31810.00
      5    32931.82   44.31  0.30( 0.30) 0.99   12945.7   31400.00
      6    34287.50   52.14  0.30( 0.30) 0.99   16082.2   40100.00
      7    36731.28   60.77  0.30( 0.30) 0.99   19426.5   11801.00
      8    39376.32   70.24  0.30( 0.30) 0.99   23721.9   11530.00
      9    41535.55   78.76  0.30( 0.30) 0.99   28705.8   11910.00
     10    43564.90   85.86  0.30( 0.30) 0.99   33311.9   11330.00
     11    44541.86   92.19  0.30( 0.30) 0.99   37742.3   11130.00
     12    44335.97   99.78  0.30( 0.30) 0.99   41732.5   12330.00
     13    44018.33  106.43  0.30( 0.30) 0.99   45075.6   12400.00
     14    43401.53  115.10  0.30( 0.30) 0.99   48442.9   12201.00
     15    42902.20  119.06  0.30( 0.30) 0.99   49529.2   12111.00
     16    42205.20  124.43  0.30( 0.30) 0.99   50898.6   12101.10
     17    41650.87  128.45  0.30( 0.30) 0.99   51749.3   10400.00
     18    40069.04  136.45  0.30( 0.30) 0.99   53061.4   12010.00
     19    38731.19  142.35  0.30( 0.30) 0.99   53378.0   10210.00
     20    35148.69  168.41  0.30( 0.30) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =    54110.0
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  12904.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    24432.14   17.97  0.30( 0.30) 0.99    3795.5   50400.00
      2    27926.46   26.98  0.30( 0.30) 0.99    6562.8   31100.00
      3    31501.43   37.09  0.30( 0.30) 0.99   10003.8   50100.00
      4    32271.27   40.79  0.30( 0.30) 0.99   11481.3   31810.00
      5    32931.82   44.31  0.30( 0.30) 0.99   12945.7   31400.00
      6    34287.50   52.14  0.30( 0.30) 0.99   16082.2   40100.00
      7    36731.28   60.77  0.30( 0.30) 0.99   19426.5   11801.00
      8    39376.32   70.24  0.30( 0.30) 0.99   23721.9   11530.00
      9    41535.55   78.76  0.30( 0.30) 0.99   28705.8   11910.00
     10    43564.90   85.86  0.30( 0.30) 0.99   33311.9   11330.00
     11    44541.86   92.19  0.30( 0.30) 0.99   37742.3   11130.00
     12    44335.97   99.78  0.30( 0.30) 0.99   41732.5   12330.00
     13    44018.33  106.43  0.30( 0.30) 0.99   45075.6   12400.00
     14    43401.53  115.10  0.30( 0.30) 0.99   48442.9   12201.00
     15    42902.20  119.06  0.30( 0.30) 0.99   49529.2   12111.00
     16    42205.20  124.43  0.30( 0.30) 0.99   50898.6   12101.10
     17    41650.87  128.45  0.30( 0.30) 0.99   51749.3   10400.00
     18    40069.04  136.45  0.30( 0.30) 0.99   53061.4   12010.00
     19    38731.19  142.35  0.30( 0.30) 0.99   53378.0   10210.00
     20    35148.69  168.41  0.30( 0.30) 0.99   54110.0   10100.00
    TOTAL AREA(ACRES) =     54110.0

****************************************************************************
  FLOW PROCESS FROM NODE  12904.00 TO NODE  13308.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    213.00  DOWNSTREAM(FEET) =    212.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1389.52   CHANNEL SLOPE =  0.0007
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  19.18
  CHANNEL FLOW THRU SUBAREA(CFS) =   44541.86
  FLOW VELOCITY(FEET/SEC.) =   7.85   FLOW DEPTH(FEET) =  19.18
  TRAVEL TIME(MIN.) =   2.95   Tc(MIN.) =   95.14
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24432.14   21.51    2.321  0.30( 0.30) 0.99    3795.5   50400.00
      2    27926.46   30.37    1.863  0.30( 0.30) 0.99    6562.8   31100.00
      3    31501.43   40.37    1.608  0.30( 0.30) 0.99   10003.8   50100.00
      4    32271.27   44.04    1.529  0.30( 0.30) 0.99   11481.3   31810.00
      5    32931.82   47.54    1.453  0.30( 0.30) 0.99   12945.7   31400.00
      6    34287.50   55.33    1.341  0.30( 0.30) 0.99   16082.2   40100.00
      7    36731.28   63.90    1.264  0.30( 0.30) 0.99   19426.5   11801.00
```



```
      8    39376.32   73.30    1.200  0.30( 0.30) 0.99   23721.9   11530.00
      9    41535.55   81.77    1.143  0.30( 0.30) 0.99   28705.8   11910.00
     10    43564.90   88.83    1.095  0.30( 0.30) 0.99   33311.9   11330.00
     11    44541.86   95.14    1.064  0.30( 0.30) 0.99   37742.3   11130.00
     12    44335.97  102.73    1.029  0.30( 0.30) 0.99   41732.5   12330.00
     13    44018.33  109.39    0.999  0.30( 0.30) 0.99   45075.6   12400.00
     14    43401.53  118.07    0.959  0.30( 0.30) 0.99   48442.9   12201.00
     15    42902.20  122.04    0.945  0.30( 0.30) 0.99   49529.2   12111.00
     16    42205.20  127.43    0.931  0.30( 0.30) 0.99   50898.6   12101.10
     17    41650.87  131.46    0.921  0.30( 0.30) 0.99   51749.3   10400.00
     18    40069.04  139.50    0.900  0.30( 0.30) 0.99   53061.4   12010.00
     19    38731.19  145.42    0.884  0.30( 0.30) 0.99   53378.0   10210.00
     20    35148.69  171.57    0.816  0.30( 0.30) 0.99   54110.0   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   44541.86  Tc(MIN.) =   95.14
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =   37742.30

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13308.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    24432.14   21.51    2.321  0.30( 0.30) 0.99    3795.5   50400.00
      2    27926.46   30.37    1.863  0.30( 0.30) 0.99    6562.8   31100.00
      3    31501.43   40.37    1.608  0.30( 0.30) 0.99   10003.8   50100.00
      4    32271.27   44.04    1.529  0.30( 0.30) 0.99   11481.3   31810.00
      5    32931.82   47.54    1.453  0.30( 0.30) 0.99   12945.7   31400.00
      6    34287.50   55.33    1.341  0.30( 0.30) 0.99   16082.2   40100.00
      7    36731.28   63.90    1.264  0.30( 0.30) 0.99   19426.5   11801.00
      8    39376.32   73.30    1.200  0.30( 0.30) 0.99   23721.9   11530.00
      9    41535.55   81.77    1.143  0.30( 0.30) 0.99   28705.8   11910.00
     10    43564.90   88.83    1.095  0.30( 0.30) 0.99   33311.9   11330.00
     11    44541.86   95.14    1.064  0.30( 0.30) 0.99   37742.3   11130.00
     12    44335.97  102.73    1.029  0.30( 0.30) 0.99   41732.5   12330.00
     13    44018.33  109.39    0.999  0.30( 0.30) 0.99   45075.6   12400.00
     14    43401.53  118.07    0.959  0.30( 0.30) 0.99   48442.9   12201.00
     15    42902.20  122.04    0.945  0.30( 0.30) 0.99   49529.2   12111.00
     16    42205.20  127.43    0.931  0.30( 0.30) 0.99   50898.6   12101.10
     17    41650.87  131.46    0.921  0.30( 0.30) 0.99   51749.3   10400.00
     18    40069.04  139.50    0.900  0.30( 0.30) 0.99   53061.4   12010.00
     19    38731.19  145.42    0.884  0.30( 0.30) 0.99   53378.0   10210.00
     20    35148.69  171.57    0.816  0.30( 0.30) 0.99   54110.0   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13308.00 =  118090.66 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     5974.58   20.85    2.363  0.30( 0.28) 0.95    1788.8   30900.00
      2     5978.93   20.89    2.361  0.30( 0.28) 0.95    1793.0   30910.00
      3     6073.00   22.23    2.274  0.30( 0.28) 0.95    1923.0   31000.00
      4     6121.29   23.02    2.223  0.30( 0.28) 0.95    1996.1   30800.00
      5     6194.32   24.25    2.144  0.30( 0.28) 0.94    2115.8   30700.00
      6     6254.91   26.05    2.048  0.30( 0.28) 0.94    2289.1   30600.00
```

7	6483.78	30.87	1.850	0.30(0.28)	0.94	2770.3	21300.00
8	6493.60	30.99	1.847	0.30(0.28)	0.94	2785.5	30520.00
9	6543.15	31.72	1.828	0.30(0.28)	0.94	2873.6	30410.00
10	6578.01	32.31	1.813	0.30(0.28)	0.94	2940.8	30540.00
11	6606.86	33.02	1.795	0.30(0.28)	0.94	3014.8	21200.00
12	6616.35	33.38	1.786	0.30(0.28)	0.94	3048.3	30210.00
13	6651.79	33.60	1.780	0.30(0.28)	0.94	3086.1	30510.00
14	6656.23	33.63	1.779	0.30(0.28)	0.94	3090.8	30200.00
15	6782.46	34.96	1.745	0.30(0.28)	0.93	3293.5	30500.00
16	6825.22	35.43	1.733	0.30(0.28)	0.93	3362.0	30100.00
17	6834.74	36.07	1.717	0.30(0.28)	0.93	3450.0	30400.00
18	6854.88	37.88	1.671	0.30(0.28)	0.92	3687.8	30110.00
19	6906.91	40.71	1.601	0.30(0.27)	0.91	4060.3	30300.00
20	6924.56	41.90	1.575	0.30(0.27)	0.91	4205.0	21400.00
21	7065.01	55.59	1.338	0.30(0.27)	0.89	5714.9	13210.00
22	7076.00	56.09	1.333	0.30(0.27)	0.89	5767.0	13200.00
23	7057.69	57.29	1.320	0.30(0.27)	0.88	5856.6	13100.00
24	6325.77	81.57	1.144	0.30(0.26)	0.87	7094.8	13000.00
25	6227.16	83.89	1.129	0.30(0.26)	0.87	7114.6	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30155.23	20.85	2.363	0.30(0.29)	0.97	5467.7	30900.00
2	30176.65	20.89	2.361	0.30(0.29)	0.97	5479.4	30910.00
3	30454.36	21.51	2.321	0.30(0.29)	0.97	5648.3	50400.00
4	30790.98	22.23	2.274	0.30(0.29)	0.97	5944.9	31000.00
5	31151.96	23.02	2.223	0.30(0.29)	0.97	6265.6	30800.00
6	31707.18	24.25	2.144	0.30(0.29)	0.97	6767.1	30700.00
7	32479.48	26.05	2.048	0.30(0.29)	0.97	7504.1	30600.00
8	34386.43	30.37	1.863	0.30(0.29)	0.97	9283.1	31100.00
9	34589.55	30.87	1.850	0.30(0.29)	0.97	9505.7	21300.00
10	34641.07	30.99	1.847	0.30(0.29)	0.97	9561.1	30520.00
11	34951.56	31.72	1.828	0.30(0.29)	0.97	9900.3	30410.00
12	35196.87	32.31	1.813	0.30(0.29)	0.97	10170.1	30540.00
13	35480.34	33.02	1.795	0.30(0.29)	0.97	10489.1	21200.00
14	35618.38	33.38	1.786	0.30(0.29)	0.97	10646.4	30210.00
15	35733.95	33.60	1.780	0.30(0.29)	0.97	10761.3	30510.00
16	35748.44	33.63	1.779	0.30(0.29)	0.97	10775.6	30200.00
17	36351.45	34.96	1.745	0.30(0.29)	0.97	11437.3	30500.00
18	36561.69	35.43	1.733	0.30(0.29)	0.97	11666.9	30100.00
19	36801.27	36.07	1.717	0.30(0.29)	0.97	11976.4	30400.00
20	37465.95	37.88	1.671	0.30(0.29)	0.97	12834.6	30110.00
21	38402.09	40.37	1.608	0.30(0.29)	0.97	14019.3	50100.00
22	38479.62	40.71	1.601	0.30(0.29)	0.97	14200.9	30300.00
23	38747.30	41.90	1.575	0.30(0.29)	0.97	14825.5	21400.00
24	39217.78	44.04	1.529	0.30(0.29)	0.97	15922.3	31810.00
25	39914.26	47.54	1.453	0.30(0.29)	0.97	17772.9	31400.00
26	41349.82	55.33	1.341	0.30(0.29)	0.96	21768.0	40100.00
27	41427.66	55.59	1.338	0.30(0.29)	0.96	21899.9	13210.00
28	41580.90	56.09	1.333	0.30(0.29)	0.96	22146.7	13200.00
29	41903.26	57.29	1.320	0.30(0.29)	0.96	22702.6	13100.00
30	43589.74	63.90	1.264	0.30(0.29)	0.96	25620.2	11801.00
31	45951.16	73.30	1.200	0.30(0.29)	0.97	30395.4	11530.00
32	47809.46	81.57	1.144	0.30(0.29)	0.97	35680.8	13000.00
33	47852.69	81.77	1.143	0.30(0.29)	0.97	35802.2	11910.00
34	48371.71	83.89	1.129	0.30(0.29)	0.97	37202.7	13010.00

35	49552.50	88.83	1.095	0.30(0.29)	0.97	40426.5	11330.00
36	50304.49	95.14	1.064	0.30(0.29)	0.97	44856.9	11130.00
37	49850.15	102.73	1.029	0.30(0.29)	0.97	48847.1	12330.00
38	49314.72	109.39	0.999	0.30(0.29)	0.98	52190.2	12400.00
39	48413.73	118.07	0.959	0.30(0.29)	0.98	55557.5	12201.00
40	47813.02	122.04	0.945	0.30(0.29)	0.98	56643.8	12111.00
41	47015.43	127.43	0.931	0.30(0.29)	0.98	58013.2	12101.10
42	46385.73	131.46	0.921	0.30(0.29)	0.98	58863.9	10400.00
43	44653.75	139.50	0.900	0.30(0.29)	0.98	60176.0	12010.00
44	43205.19	145.42	0.884	0.30(0.29)	0.98	60492.6	10210.00
45	39134.10	171.57	0.816	0.30(0.29)	0.98	61224.6	10100.00

TOTAL AREA(ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 50304.49 Tc(MIN.) = 95.145
EFFECTIVE AREA(ACRES) = 44856.91 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 61224.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 61224.6 TC(MIN.) = 95.14
EFFECTIVE AREA(ACRES) = 44856.91 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.973
PEAK FLOW RATE(CFS) = 50304.49

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30155.23	20.85	2.363	0.30(0.29)	0.97	5467.7	30900.00
2	30176.65	20.89	2.361	0.30(0.29)	0.97	5479.4	30910.00
3	30454.36	21.51	2.321	0.30(0.29)	0.97	5648.3	50400.00
4	30790.98	22.23	2.274	0.30(0.29)	0.97	5944.9	31000.00
5	31151.96	23.02	2.223	0.30(0.29)	0.97	6265.6	30800.00
6	31707.18	24.25	2.144	0.30(0.29)	0.97	6767.1	30700.00
7	32479.48	26.05	2.048	0.30(0.29)	0.97	7504.1	30600.00
8	34386.43	30.37	1.863	0.30(0.29)	0.97	9283.1	31100.00
9	34589.55	30.87	1.850	0.30(0.29)	0.97	9505.7	21300.00
10	34641.07	30.99	1.847	0.30(0.29)	0.97	9561.1	30520.00
11	34951.56	31.72	1.828	0.30(0.29)	0.97	9900.3	30410.00
12	35196.87	32.31	1.813	0.30(0.29)	0.97	10170.1	30540.00
13	35480.34	33.02	1.795	0.30(0.29)	0.97	10489.1	21200.00
14	35618.38	33.38	1.786	0.30(0.29)	0.97	10646.4	30210.00
15	35733.95	33.60	1.780	0.30(0.29)	0.97	10761.3	30510.00
16	35748.44	33.63	1.779	0.30(0.29)	0.97	10775.6	30200.00
17	36351.45	34.96	1.745	0.30(0.29)	0.97	11437.3	30500.00
18	36561.69	35.43	1.733	0.30(0.29)	0.97	11666.9	30100.00
19	36801.27	36.07	1.717	0.30(0.29)	0.97	11976.4	30400.00
20	37465.95	37.88	1.671	0.30(0.29)	0.97	12834.6	30110.00
21	38402.09	40.37	1.608	0.30(0.29)	0.97	14019.3	50100.00
22	38479.62	40.71	1.601	0.30(0.29)	0.97	14200.9	30300.00
23	38747.30	41.90	1.575	0.30(0.29)	0.97	14825.5	21400.00
24	39217.78	44.04	1.529	0.30(0.29)	0.97	15922.3	31810.00
25	39914.26	47.54	1.453	0.30(0.29)	0.97	17772.9	31400.00
26	41349.82	55.33	1.341	0.30(0.29)	0.96	21768.0	40100.00
27	41427.66	55.59	1.338	0.30(0.29)	0.96	21899.9	13210.00
28	41580.90	56.09	1.333	0.30(0.29)	0.96	22146.7	13200.00
29	41903.26	57.29	1.320	0.30(0.29)	0.96	22702.6	13100.00

30	43589.74	63.90	1.264	0.30(0.29)	0.96	25620.2	11801.00
31	45951.16	73.30	1.200	0.30(0.29)	0.97	30395.4	11530.00
32	47809.46	81.57	1.144	0.30(0.29)	0.97	35680.8	13000.00
33	47852.69	81.77	1.143	0.30(0.29)	0.97	35802.2	11910.00
34	48371.71	83.89	1.129	0.30(0.29)	0.97	37202.7	13010.00
35	49552.50	88.83	1.095	0.30(0.29)	0.97	40426.5	11330.00
36	50304.49	95.14	1.064	0.30(0.29)	0.97	44856.9	11130.00
37	49850.15	102.73	1.029	0.30(0.29)	0.97	48847.1	12330.00
38	49314.72	109.39	0.999	0.30(0.29)	0.98	52190.2	12400.00
39	48413.73	118.07	0.959	0.30(0.29)	0.98	55557.5	12201.00
40	47813.02	122.04	0.945	0.30(0.29)	0.98	56643.8	12111.00
41	47015.43	127.43	0.931	0.30(0.29)	0.98	58013.2	12101.10
42	46385.73	131.46	0.921	0.30(0.29)	0.98	58863.9	10400.00
43	44653.75	139.50	0.900	0.30(0.29)	0.98	60176.0	12010.00
44	43205.19	145.42	0.884	0.30(0.29)	0.98	60492.6	10210.00
45	39134.10	171.57	0.816	0.30(0.29)	0.98	61224.6	10100.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S34.DAT
  TIME/DATE OF STUDY: 08:15 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.851
   2)   10.00;  3.777
   3)   15.00;  2.925
   4)   20.00;  2.414
   5)   25.00;  2.092
   6)   30.00;  1.869
   7)   40.00;  1.614
   8)   50.00;  1.398
   9)   60.00;  1.287
  10)   90.00;  1.084
  11)  120.00;  0.947
  12)  180.00;  0.791
  13)  360.00;  0.585
  14) 1200.00;  0.255
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S33.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    32479.48   26.05  0.30( 0.29) 0.97    7504.1   30600.00
      2    35748.44   33.63  0.30( 0.29) 0.97   10775.6   30200.00
      3    37465.95   37.88  0.30( 0.29) 0.97   12834.6   30110.00
      4    39217.78   44.04  0.30( 0.29) 0.97   15922.3   31810.00
      5    39914.26   47.54  0.30( 0.29) 0.97   17772.9   31400.00
      6    41903.26   57.29  0.30( 0.29) 0.96   22702.6   13100.00
      7    43589.74   63.90  0.30( 0.29) 0.96   25620.2   11801.00
      8    45951.16   73.30  0.30( 0.29) 0.97   30395.4   11530.00
      9    48371.71   83.89  0.30( 0.29) 0.97   37202.7   13010.00
     10    49552.50   88.83  0.30( 0.29) 0.97   40426.5   11330.00
     11    50304.49   95.14  0.30( 0.29) 0.97   44856.9   11130.00
     12    49850.15  102.73  0.30( 0.29) 0.97   48847.1   12330.00
     13    49314.72  109.39  0.30( 0.29) 0.98   52190.2   12400.00
     14    48413.73  118.07  0.30( 0.29) 0.98   55557.5   12201.00
     15    47813.02  122.04  0.30( 0.29) 0.98   56643.8   12111.00
     16    47015.43  127.43  0.30( 0.29) 0.98   58013.2   12101.10
     17    46385.73  131.46  0.30( 0.29) 0.98   58863.9   10400.00
     18    44653.75  139.50  0.30( 0.29) 0.98   60176.0   12010.00
     19    43205.19  145.42  0.30( 0.29) 0.98   60492.6   10210.00
     20    39134.10  171.57  0.30( 0.29) 0.98   61224.6   10100.00
   TOTAL AREA(ACRES) =    61224.6

**************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    32479.48   26.05  0.30( 0.29) 0.97    7504.1   30600.00
      2    35748.44   33.63  0.30( 0.29) 0.97   10775.6   30200.00
      3    37465.95   37.88  0.30( 0.29) 0.97   12834.6   30110.00
      4    39217.78   44.04  0.30( 0.29) 0.97   15922.3   31810.00
      5    39914.26   47.54  0.30( 0.29) 0.97   17772.9   31400.00
      6    41903.26   57.29  0.30( 0.29) 0.96   22702.6   13100.00
      7    43589.74   63.90  0.30( 0.29) 0.96   25620.2   11801.00
      8    45951.16   73.30  0.30( 0.29) 0.97   30395.4   11530.00
      9    48371.71   83.89  0.30( 0.29) 0.97   37202.7   13010.00
     10    49552.50   88.83  0.30( 0.29) 0.97   40426.5   11330.00
     11    50304.49   95.14  0.30( 0.29) 0.97   44856.9   11130.00
     12    49850.15  102.73  0.30( 0.29) 0.97   48847.1   12330.00
     13    49314.72  109.39  0.30( 0.29) 0.98   52190.2   12400.00
     14    48413.73  118.07  0.30( 0.29) 0.98   55557.5   12201.00
     15    47813.02  122.04  0.30( 0.29) 0.98   56643.8   12111.00
     16    47015.43  127.43  0.30( 0.29) 0.98   58013.2   12101.10
     17    46385.73  131.46  0.30( 0.29) 0.98   58863.9   10400.00
     18    44653.75  139.50  0.30( 0.29) 0.98   60176.0   12010.00
```

```
    19    43205.19  145.42  0.30( 0.29) 0.98   60492.6   10210.00
    20    39134.10  171.57  0.30( 0.29) 0.98   61224.6   10100.00
   TOTAL AREA(ACRES) =     61224.6

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13402.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    212.00  DOWNSTREAM(FEET) =    209.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   623.02   CHANNEL SLOPE =  0.0048
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.22
  CHANNEL FLOW THRU SUBAREA(CFS) =   50304.49
  FLOW VELOCITY(FEET/SEC.) =  15.77   FLOW DEPTH(FEET) =  12.22
  TRAVEL TIME(MIN.) =   0.66   Tc(MIN.) =   95.80
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    32479.48   26.81    2.011  0.30( 0.29) 0.97    7504.1   30600.00
      2    35748.44   34.36    1.758  0.30( 0.29) 0.97   10775.6   30200.00
      3    37465.95   38.60    1.650  0.30( 0.29) 0.97   12834.6   30110.00
      4    39217.78   44.75    1.511  0.30( 0.29) 0.97   15922.3   31810.00
      5    39914.26   48.25    1.436  0.30( 0.29) 0.97   17772.9   31400.00
      6    41903.26   57.98    1.309  0.30( 0.29) 0.96   22702.6   13100.00
      7    43589.74   64.58    1.256  0.30( 0.29) 0.96   25620.2   11801.00
      8    45951.16   73.98    1.192  0.30( 0.29) 0.97   30395.4   11530.00
      9    48371.71   84.56    1.121  0.30( 0.29) 0.97   37202.7   13010.00
     10    49552.50   89.49    1.087  0.30( 0.29) 0.97   40426.5   11330.00
     11    50304.49   95.80    1.057  0.30( 0.29) 0.97   44856.9   11130.00
     12    49850.15  103.39    1.023  0.30( 0.29) 0.97   48847.1   12330.00
     13    49314.72  110.05    0.992  0.30( 0.29) 0.98   52190.2   12400.00
     14    48413.73  118.74    0.953  0.30( 0.29) 0.98   55557.5   12201.00
     15    47813.02  122.71    0.940  0.30( 0.29) 0.98   56643.8   12111.00
     16    47015.43  128.10    0.926  0.30( 0.29) 0.98   58013.2   12101.10
     17    46385.73  132.14    0.915  0.30( 0.29) 0.98   58863.9   10400.00
     18    44653.75  140.18    0.895  0.30( 0.29) 0.98   60176.0   12010.00
     19    43205.19  146.11    0.879  0.30( 0.29) 0.98   60492.6   10210.00
     20    39134.10  172.29    0.811  0.30( 0.29) 0.98   61224.6   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   50304.49  Tc(MIN.) =   95.80
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   44856.91

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610505Y.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      299.75   19.45  0.30( 0.30) 0.99     153.2   50500.00
```



```
   TOTAL AREA(ACRES) =      153.2

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13402.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    32479.48   26.81    2.011  0.30( 0.29) 0.97    7504.1   30600.00
      2    35748.44   34.36    1.758  0.30( 0.29) 0.97   10775.6   30200.00
      3    37465.95   38.60    1.650  0.30( 0.29) 0.97   12834.6   30110.00
      4    39217.78   44.75    1.511  0.30( 0.29) 0.97   15922.3   31810.00
      5    39914.26   48.25    1.436  0.30( 0.29) 0.97   17772.9   31400.00
      6    41903.26   57.98    1.309  0.30( 0.29) 0.96   22702.6   13100.00
      7    43589.74   64.58    1.256  0.30( 0.29) 0.96   25620.2   11801.00
      8    45951.16   73.98    1.192  0.30( 0.29) 0.97   30395.4   11530.00
      9    48371.71   84.56    1.121  0.30( 0.29) 0.97   37202.7   13010.00
     10    49552.50   89.49    1.087  0.30( 0.29) 0.97   40426.5   11330.00
     11    50304.49   95.80    1.057  0.30( 0.29) 0.97   44856.9   11130.00
     12    49850.15  103.39    1.023  0.30( 0.29) 0.97   48847.1   12330.00
     13    49314.72  110.05    0.992  0.30( 0.29) 0.98   52190.2   12400.00
     14    48413.73  118.74    0.953  0.30( 0.29) 0.98   55557.5   12201.00
     15    47813.02  122.71    0.940  0.30( 0.29) 0.98   56643.8   12111.00
     16    47015.43  128.10    0.926  0.30( 0.29) 0.98   58013.2   12101.10
     17    46385.73  132.14    0.915  0.30( 0.29) 0.98   58863.9   10400.00
     18    44653.75  140.18    0.895  0.30( 0.29) 0.98   60176.0   12010.00
     19    43205.19  146.11    0.879  0.30( 0.29) 0.98   60492.6   10210.00
     20    39134.10  172.29    0.811  0.30( 0.29) 0.98   61224.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      299.75   19.45    2.470  0.30( 0.30) 0.99     153.2   50500.00
  LONGEST FLOWPATH FROM NODE  50500.00 TO NODE  13402.00 =    6247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    30152.10   19.45    2.470  0.30( 0.29) 0.97    5596.4   50500.00
      2    32715.93   26.81    2.011  0.30( 0.29) 0.97    7657.3   30600.00
      3    35949.95   34.36    1.758  0.30( 0.29) 0.97   10928.8   30200.00
      4    37652.57   38.60    1.650  0.30( 0.29) 0.97   12987.7   30110.00
      5    39385.33   44.75    1.511  0.30( 0.29) 0.97   16075.4   31810.00
      6    40071.39   48.25    1.436  0.30( 0.29) 0.97   17926.1   31400.00
      7    42042.96   57.98    1.309  0.30( 0.29) 0.96   22855.7   13100.00
      8    43722.09   64.58    1.256  0.30( 0.29) 0.96   25773.4   11801.00
      9    46074.74   73.98    1.192  0.30( 0.29) 0.97   30548.6   11530.00
     10    48485.43   84.56    1.121  0.30( 0.29) 0.97   37355.8   13010.00
     11    49661.61   89.49    1.087  0.30( 0.29) 0.97   40579.7   11330.00
     12    50409.48   95.80    1.057  0.30( 0.29) 0.97   45010.1   11130.00
     13    49950.36  103.39    1.023  0.30( 0.29) 0.97   49000.3   12330.00
     14    49410.74  110.05    0.992  0.30( 0.29) 0.98   52343.4   12400.00
     15    48504.29  118.74    0.953  0.30( 0.29) 0.98   55710.7   12201.00
     16    47901.80  122.71    0.940  0.30( 0.29) 0.98   56797.0   12111.00
```

```
    17    47102.29  128.10    0.926  0.30( 0.29) 0.98   58166.4   12101.10
    18    46471.13  132.14    0.915  0.30( 0.29) 0.98   59017.1   10400.00
    19    44736.27  140.18    0.895  0.30( 0.29) 0.98   60329.2   12010.00
    20    43285.59  146.11    0.879  0.30( 0.29) 0.98   60645.8   10210.00
    21    39205.12  172.29    0.811  0.30( 0.29) 0.98   61377.8   10100.00
   TOTAL AREA(ACRES) =     61377.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    50409.48  Tc(MIN.) =   95.803
  EFFECTIVE AREA(ACRES) =  45010.09  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61377.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13402.00 =  118713.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13402.00 TO NODE  13404.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    209.00  DOWNSTREAM(FEET) =    207.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   395.35   CHANNEL SLOPE =  0.0051
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  12.06
  CHANNEL FLOW THRU SUBAREA(CFS) =   50409.48
  FLOW VELOCITY(FEET/SEC.) =  16.05   FLOW DEPTH(FEET) =  12.06
  TRAVEL TIME(MIN.) =   0.41   Tc(MIN.) =   96.21
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    30152.10   19.93    2.421  0.30( 0.29) 0.97    5596.4   50500.00
      2    32715.93   27.28    1.990  0.30( 0.29) 0.97    7657.3   30600.00
      3    35949.95   34.82    1.746  0.30( 0.29) 0.97   10928.8   30200.00
      4    37652.57   39.05    1.638  0.30( 0.29) 0.97   12987.7   30110.00
      5    39385.33   45.20    1.502  0.30( 0.29) 0.97   16075.4   31810.00
      6    40071.39   48.69    1.426  0.30( 0.29) 0.97   17926.1   31400.00
      7    42042.96   58.42    1.305  0.30( 0.29) 0.96   22855.7   13100.00
      8    43722.09   65.01    1.253  0.30( 0.29) 0.96   25773.4   11801.00
      9    46074.74   74.40    1.190  0.30( 0.29) 0.97   30548.6   11530.00
     10    48485.43   84.97    1.118  0.30( 0.29) 0.97   37355.8   13010.00
     11    49661.61   89.91    1.085  0.30( 0.29) 0.97   40579.7   11330.00
     12    50409.48   96.21    1.056  0.30( 0.29) 0.97   45010.1   11130.00
     13    49950.36  103.81    1.021  0.30( 0.29) 0.97   49000.3   12330.00
     14    49410.74  110.46    0.991  0.30( 0.29) 0.98   52343.4   12400.00
     15    48504.29  119.15    0.951  0.30( 0.29) 0.98   55710.7   12201.00
     16    47901.80  123.13    0.939  0.30( 0.29) 0.98   56797.0   12111.00
     17    47102.29  128.52    0.925  0.30( 0.29) 0.98   58166.4   12101.10
     18    46471.13  132.56    0.914  0.30( 0.29) 0.98   59017.1   10400.00
     19    44736.27  140.61    0.893  0.30( 0.29) 0.98   60329.2   12010.00
     20    43285.59  146.54    0.878  0.30( 0.29) 0.98   60645.8   10210.00
     21    39205.12  172.73    0.810  0.30( 0.29) 0.98   61377.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   50409.48  Tc(MIN.) =   96.21
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   45010.09
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610506Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      107.09   17.21  0.30( 0.30) 1.00      49.6   50600.00
    TOTAL AREA(ACRES) =       49.6

****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13404.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    30152.10   19.93    2.421  0.30( 0.29) 0.97    5596.4   50500.00
      2    32715.93   27.28    1.990  0.30( 0.29) 0.97    7657.3   30600.00
      3    35949.95   34.82    1.746  0.30( 0.29) 0.97   10928.8   30200.00
      4    37652.57   39.05    1.638  0.30( 0.29) 0.97   12987.7   30110.00
      5    39385.33   45.20    1.502  0.30( 0.29) 0.97   16075.4   31810.00
      6    40071.39   48.69    1.426  0.30( 0.29) 0.97   17926.1   31400.00
      7    42042.96   58.42    1.305  0.30( 0.29) 0.96   22855.7   13100.00
      8    43722.09   65.01    1.253  0.30( 0.29) 0.96   25773.4   11801.00
      9    46074.74   74.40    1.190  0.30( 0.29) 0.97   30548.6   11530.00
     10    48485.43   84.97    1.118  0.30( 0.29) 0.97   37355.8   13010.00
     11    49661.61   89.91    1.085  0.30( 0.29) 0.97   40579.7   11330.00
     12    50409.48   96.21    1.056  0.30( 0.29) 0.97   45010.1   11130.00
     13    49950.36  103.81    1.021  0.30( 0.29) 0.97   49000.3   12330.00
     14    49410.74  110.46    0.991  0.30( 0.29) 0.98   52343.4   12400.00
     15    48504.29  119.15    0.951  0.30( 0.29) 0.98   55710.7   12201.00
     16    47901.80  123.13    0.939  0.30( 0.29) 0.98   56797.0   12111.00
     17    47102.29  128.52    0.925  0.30( 0.29) 0.98   58166.4   12101.10
     18    46471.13  132.56    0.914  0.30( 0.29) 0.98   59017.1   10400.00
     19    44736.27  140.61    0.893  0.30( 0.29) 0.98   60329.2   12010.00
     20    43285.59  146.54    0.878  0.30( 0.29) 0.98   60645.8   10210.00
     21    39205.12  172.73    0.810  0.30( 0.29) 0.98   61377.8   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      107.09   17.21    2.699  0.30( 0.30) 1.00      49.6   50600.00
  LONGEST FLOWPATH FROM NODE  50600.00 TO NODE  13404.00 =    4378.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    29542.17   17.21    2.699  0.30( 0.29) 0.97    4880.8   50600.00
      2    30246.76   19.93    2.421  0.30( 0.29) 0.97    5646.0   50500.00
      3    32791.37   27.28    1.990  0.30( 0.29) 0.97    7706.8   30600.00
      4    36014.49   34.82    1.746  0.30( 0.29) 0.97   10978.4   30200.00
```

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     5    37712.30   39.05    1.638  0.30( 0.29) 0.97   13037.3   30110.00
     6    39438.97   45.20    1.502  0.30( 0.29) 0.97   16125.0   31810.00
     7    40121.66   48.69    1.426  0.30( 0.29) 0.97   17975.7   31400.00
     8    42087.80   58.42    1.305  0.30( 0.29) 0.96   22905.3   13100.00
     9    43764.63   65.01    1.253  0.30( 0.29) 0.96   25822.9   11801.00
    10    46114.45   74.40    1.190  0.30( 0.29) 0.97   30598.1   11530.00
    11    48521.94   84.97    1.118  0.30( 0.29) 0.97   37405.4   13010.00
    12    49696.63   89.91    1.085  0.30( 0.29) 0.97   40629.3   11330.00
    13    50443.21   96.21    1.056  0.30( 0.29) 0.97   45059.7   11130.00
    14    49982.54  103.81    1.021  0.30( 0.29) 0.97   49049.9   12330.00
    15    49441.56  110.46    0.991  0.30( 0.29) 0.98   52393.0   12400.00
    16    48533.34  119.15    0.951  0.30( 0.29) 0.98   55760.3   12201.00
    17    47930.32  123.13    0.939  0.30( 0.29) 0.98   56846.6   12111.00
    18    47130.18  128.52    0.925  0.30( 0.29) 0.98   58216.0   12101.10
    19    46498.55  132.56    0.914  0.30( 0.29) 0.98   59066.7   10400.00
    20    44762.76  140.61    0.893  0.30( 0.29) 0.98   60378.8   12010.00
    21    43311.39  146.54    0.878  0.30( 0.29) 0.98   60695.4   10210.00
    22    39227.88  172.73    0.810  0.30( 0.29) 0.98   61427.4   10100.00
  TOTAL AREA(ACRES) =     61427.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    50443.21  Tc(MIN.) =   96.214
  EFFECTIVE AREA(ACRES) =  45059.68  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61427.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13404.00 =  119109.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13404.00 TO NODE  13406.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    207.00  DOWNSTREAM(FEET) =    195.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1601.97   CHANNEL SLOPE =  0.0075
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.82
  CHANNEL FLOW THRU SUBAREA(CFS) =   50443.21
  FLOW VELOCITY(FEET/SEC.) =  18.36   FLOW DEPTH(FEET) =  10.82
  TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =   97.67
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    29542.17   18.94    2.522  0.30( 0.29) 0.97    4880.8   50600.00
      2    30246.76   21.65    2.308  0.30( 0.29) 0.97    5646.0   50500.00
      3    32791.37   28.96    1.916  0.30( 0.29) 0.97    7706.8   30600.00
      4    36014.49   36.44    1.705  0.30( 0.29) 0.97   10978.4   30200.00
      5    37712.30   40.65    1.600  0.30( 0.29) 0.97   13037.3   30110.00
      6    39438.97   46.77    1.468  0.30( 0.29) 0.97   16125.0   31810.00
      7    40121.66   50.26    1.395  0.30( 0.29) 0.97   17975.7   31400.00
      8    42087.80   59.96    1.287  0.30( 0.29) 0.96   22905.3   13100.00
      9    43764.63   66.54    1.243  0.30( 0.29) 0.96   25822.9   11801.00
     10    46114.45   75.90    1.179  0.30( 0.29) 0.97   30598.1   11530.00
     11    48521.94   86.44    1.108  0.30( 0.29) 0.97   37405.4   13010.00
     12    49696.63   91.37    1.078  0.30( 0.29) 0.97   40629.3   11330.00
```



```
     13    50443.21   97.67    1.049  0.30( 0.29) 0.97   45059.7   11130.00
     14    49982.54  105.27    1.014  0.30( 0.29) 0.97   49049.9   12330.00
     15    49441.56  111.93    0.984  0.30( 0.29) 0.98   52393.0   12400.00
     16    48533.34  120.62    0.945  0.30( 0.29) 0.98   55760.3   12201.00
     17    47930.32  124.61    0.935  0.30( 0.29) 0.98   56846.6   12111.00
     18    47130.18  130.01    0.921  0.30( 0.29) 0.98   58216.0   12101.10
     19    46498.55  134.05    0.910  0.30( 0.29) 0.98   59066.7   10400.00
     20    44762.76  142.12    0.889  0.30( 0.29) 0.98   60378.8   12010.00
     21    43311.39  148.07    0.874  0.30( 0.29) 0.98   60695.4   10210.00
     22    39227.88  174.31    0.806  0.30( 0.29) 0.98   61427.4   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   50443.21  Tc(MIN.) =   97.67
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   45059.68

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610211Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      236.24   12.70  0.30( 0.30) 1.00      87.0   21100.00
    TOTAL AREA(ACRES) =       87.0

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13406.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    29542.17   18.94    2.522  0.30( 0.29) 0.97    4880.8   50600.00
      2    30246.76   21.65    2.308  0.30( 0.29) 0.97    5646.0   50500.00
      3    32791.37   28.96    1.916  0.30( 0.29) 0.97    7706.8   30600.00
      4    36014.49   36.44    1.705  0.30( 0.29) 0.97   10978.4   30200.00
      5    37712.30   40.65    1.600  0.30( 0.29) 0.97   13037.3   30110.00
      6    39438.97   46.77    1.468  0.30( 0.29) 0.97   16125.0   31810.00
      7    40121.66   50.26    1.395  0.30( 0.29) 0.97   17975.7   31400.00
      8    42087.80   59.96    1.287  0.30( 0.29) 0.96   22905.3   13100.00
      9    43764.63   66.54    1.243  0.30( 0.29) 0.96   25822.9   11801.00
     10    46114.45   75.90    1.179  0.30( 0.29) 0.97   30598.1   11530.00
     11    48521.94   86.44    1.108  0.30( 0.29) 0.97   37405.4   13010.00
     12    49696.63   91.37    1.078  0.30( 0.29) 0.97   40629.3   11330.00
     13    50443.21   97.67    1.049  0.30( 0.29) 0.97   45059.7   11130.00
     14    49982.54  105.27    1.014  0.30( 0.29) 0.97   49049.9   12330.00
     15    49441.56  111.93    0.984  0.30( 0.29) 0.98   52393.0   12400.00
     16    48533.34  120.62    0.945  0.30( 0.29) 0.98   55760.3   12201.00
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    17    47930.32  124.61    0.935  0.30( 0.29) 0.98   56846.6   12111.00
    18    47130.18  130.01    0.921  0.30( 0.29) 0.98   58216.0   12101.10
    19    46498.55  134.05    0.910  0.30( 0.29) 0.98   59066.7   10400.00
    20    44762.76  142.12    0.889  0.30( 0.29) 0.98   60378.8   12010.00
    21    43311.39  148.07    0.874  0.30( 0.29) 0.98   60695.4   10210.00
    22    39227.88  174.31    0.806  0.30( 0.29) 0.98   61427.4   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      236.24   12.70    3.317  0.30( 0.30) 1.00      87.0   21100.00
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  13406.00 =    2859.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    27102.30   12.70    3.317  0.30( 0.29) 0.97    3359.3   21100.00
      2    29716.18   18.94    2.522  0.30( 0.29) 0.97    4967.8   50600.00
      3    30403.95   21.65    2.308  0.30( 0.29) 0.97    5733.0   50500.00
      4    32917.86   28.96    1.916  0.30( 0.29) 0.97    7793.8   30600.00
      5    36124.47   36.44    1.705  0.30( 0.29) 0.97   11065.4   30200.00
      6    37814.09   40.65    1.600  0.30( 0.29) 0.97   13124.3   30110.00
      7    39530.40   46.77    1.468  0.30( 0.29) 0.97   16212.0   31810.00
      8    40207.41   50.26    1.395  0.30( 0.29) 0.97   18062.7   31400.00
      9    42165.12   59.96    1.287  0.30( 0.29) 0.96   22992.3   13100.00
     10    43838.45   66.54    1.243  0.30( 0.29) 0.96   25910.0   11801.00
     11    46183.30   75.90    1.179  0.30( 0.29) 0.97   30685.1   11530.00
     12    48585.21   86.44    1.108  0.30( 0.29) 0.97   37492.4   13010.00
     13    49757.53   91.37    1.078  0.30( 0.29) 0.97   40716.3   11330.00
     14    50501.85   97.67    1.049  0.30( 0.29) 0.97   45146.7   11130.00
     15    50038.47  105.27    1.014  0.30( 0.29) 0.98   49136.9   12330.00
     16    49495.11  111.93    0.984  0.30( 0.29) 0.98   52480.0   12400.00
     17    48583.87  120.62    0.945  0.30( 0.29) 0.98   55847.3   12201.00
     18    47980.04  124.61    0.935  0.30( 0.29) 0.98   56933.6   12111.00
     19    47178.80  130.01    0.921  0.30( 0.29) 0.98   58303.0   12101.10
     20    46546.36  134.05    0.910  0.30( 0.29) 0.98   59153.7   10400.00
     21    44808.92  142.12    0.889  0.30( 0.29) 0.98   60465.8   12010.00
     22    43356.33  148.07    0.874  0.30( 0.29) 0.98   60782.4   10210.00
     23    39267.48  174.31    0.806  0.30( 0.29) 0.98   61514.4   10100.00
    TOTAL AREA(ACRES) =     61514.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    50501.85  Tc(MIN.) =   97.668
  EFFECTIVE AREA(ACRES) =  45146.68  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    61514.4
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13406.00 =  120711.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13406.00 TO NODE  13408.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    195.00  DOWNSTREAM(FEET) =    182.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2458.36   CHANNEL SLOPE =  0.0053
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
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  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.038
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       12.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   50505.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  16.31
  AVERAGE FLOW DEPTH(FEET) =  11.93   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =  100.18
  SUBAREA AREA(ACRES) =    12.41       SUBAREA RUNOFF(CFS) =    8.24
  EFFECTIVE AREA(ACRES) =  45159.09     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    61526.8         PEAK FLOW RATE(CFS) =   50501.85
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  11.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 11.93   FLOW VELOCITY(FEET/SEC.) =  16.30
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    27102.30   15.77    2.846  0.30( 0.29) 0.98    3371.7   21100.00
      2    29716.18   21.92    2.290  0.30( 0.29) 0.97    4980.2   50600.00
      3    30403.95   24.61    2.117  0.30( 0.29) 0.97    5745.4   50500.00
      4    32917.86   31.84    1.822  0.30( 0.29) 0.97    7806.3   30600.00
      5    36124.47   39.24    1.633  0.30( 0.29) 0.97   11077.8   30200.00
      6    37814.09   43.40    1.540  0.30( 0.29) 0.97   13136.7   30110.00
      7    39530.40   49.49    1.409  0.30( 0.29) 0.97   16224.4   31810.00
      8    40207.41   52.96    1.365  0.30( 0.29) 0.97   18075.1   31400.00
      9    42165.12   62.62    1.269  0.30( 0.29) 0.96   23004.7   13100.00
     10    43838.45   69.16    1.225  0.30( 0.29) 0.96   25922.4   11801.00
     11    46183.30   78.49    1.162  0.30( 0.29) 0.97   30697.6   11530.00
     12    48585.21   88.99    1.091  0.30( 0.29) 0.97   37504.9   13010.00
     13    49757.53   93.89    1.066  0.30( 0.29) 0.97   40728.7   11330.00
     14    50501.85  100.18    1.038  0.30( 0.29) 0.97   45159.1   11130.00
     15    50038.47  107.79    1.003  0.30( 0.29) 0.98   49149.3   12330.00
     16    49495.11  114.46    0.972  0.30( 0.29) 0.98   52492.4   12400.00
     17    48583.87  123.17    0.939  0.30( 0.29) 0.98   55859.7   12201.00
     18    47980.04  127.16    0.928  0.30( 0.29) 0.98   56946.0   12111.00
     19    47178.80  132.57    0.914  0.30( 0.29) 0.98   58315.4   12101.10
     20    46546.36  136.63    0.904  0.30( 0.29) 0.98   59166.1   10400.00
     21    44808.92  144.73    0.883  0.30( 0.29) 0.98   60478.2   12010.00
     22    43356.33  150.71    0.867  0.30( 0.29) 0.98   60794.8   10210.00
     23    39267.48  177.03    0.799  0.30( 0.29) 0.98   61526.8   10100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =   50501.85  Tc(MIN.) =  100.18
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =   45159.09

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 FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610507Y.DNA
 MEMORY BANK #  2 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1      459.67   19.60  0.30( 0.30) 0.99     236.8   50700.00
   TOTAL AREA(ACRES) =      236.8

****************************************************************************
 FLOW PROCESS FROM NODE  13408.00 TO NODE  13408.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    27102.30   15.77    2.846  0.30( 0.29) 0.98    3371.7   21100.00
     2    29716.18   21.92    2.290  0.30( 0.29) 0.97    4980.2   50600.00
     3    30403.95   24.61    2.117  0.30( 0.29) 0.97    5745.4   50500.00
     4    32917.86   31.84    1.822  0.30( 0.29) 0.97    7806.3   30600.00
     5    36124.47   39.24    1.633  0.30( 0.29) 0.97   11077.8   30200.00
     6    37814.09   43.40    1.540  0.30( 0.29) 0.97   13136.7   30110.00
     7    39530.40   49.49    1.409  0.30( 0.29) 0.97   16224.4   31810.00
     8    40207.41   52.96    1.365  0.30( 0.29) 0.97   18075.1   31400.00
     9    42165.12   62.62    1.269  0.30( 0.29) 0.96   23004.7   13100.00
    10    43838.45   69.16    1.225  0.30( 0.29) 0.96   25922.4   11801.00
    11    46183.30   78.49    1.162  0.30( 0.29) 0.97   30697.6   11530.00
    12    48585.21   88.99    1.091  0.30( 0.29) 0.97   37504.9   13010.00
    13    49757.53   93.89    1.066  0.30( 0.29) 0.97   40728.7   11330.00
    14    50501.85  100.18    1.038  0.30( 0.29) 0.97   45159.1   11130.00
    15    50038.47  107.79    1.003  0.30( 0.29) 0.98   49149.3   12330.00
    16    49495.11  114.46    0.972  0.30( 0.29) 0.98   52492.4   12400.00
    17    48583.87  123.17    0.939  0.30( 0.29) 0.98   55859.7   12201.00
    18    47980.04  127.16    0.928  0.30( 0.29) 0.98   56946.0   12111.00
    19    47178.80  132.57    0.914  0.30( 0.29) 0.98   58315.4   12101.10
    20    46546.36  136.63    0.904  0.30( 0.29) 0.98   59166.1   10400.00
    21    44808.92  144.73    0.883  0.30( 0.29) 0.98   60478.2   12010.00
    22    43356.33  150.71    0.867  0.30( 0.29) 0.98   60794.8   10210.00
    23    39267.48  177.03    0.799  0.30( 0.29) 0.98   61526.8   10100.00
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      459.67   19.60    2.455  0.30( 0.30) 0.99     236.8   50700.00
 LONGEST FLOWPATH FROM NODE  50700.00 TO NODE  13408.00 =    7903.00 FEET.

 ** PEAK FLOW RATE TABLE **
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  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    27539.27   15.77    2.846  0.30( 0.29) 0.98    3562.3   21100.00
     2    29188.71   19.60    2.455  0.30( 0.29) 0.98    4609.5   50700.00
     3    30140.74   21.92    2.290  0.30( 0.29) 0.98    5217.0   50600.00
     4    30791.62   24.61    2.117  0.30( 0.29) 0.98    5982.2   50500.00
     5    33242.67   31.84    1.822  0.30( 0.29) 0.97    8043.0   30600.00
     6    36409.06   39.24    1.633  0.30( 0.29) 0.97   11314.6   30200.00
     7    38078.89   43.40    1.540  0.30( 0.29) 0.97   13373.5   30110.00
     8    39767.20   49.49    1.409  0.30( 0.29) 0.97   16461.2   31810.00
     9    40434.84   52.96    1.365  0.30( 0.29) 0.97   18311.9   31400.00
    10    42372.12   62.62    1.269  0.30( 0.29) 0.96   23241.5   13100.00
    11    44036.03   69.16    1.225  0.30( 0.29) 0.96   26159.1   11801.00
    12    46367.44   78.49    1.162  0.30( 0.29) 0.97   30934.3   11530.00
    13    48754.21   88.99    1.091  0.30( 0.29) 0.97   37741.6   13010.00
    14    49921.27   93.89    1.066  0.30( 0.29) 0.97   40965.5   11330.00
    15    50659.48  100.18    1.038  0.30( 0.29) 0.97   45395.9   11130.00
    16    50188.70  107.79    1.003  0.30( 0.29) 0.98   49386.1   12330.00
    17    49638.85  114.46    0.972  0.30( 0.29) 0.98   52729.2   12400.00
    18    48720.46  123.17    0.939  0.30( 0.29) 0.98   56096.5   12201.00
    19    48114.42  127.16    0.928  0.30( 0.29) 0.98   57182.8   12111.00
    20    47310.18  132.57    0.914  0.30( 0.29) 0.98   58552.2   12101.10
    21    46675.49  136.63    0.904  0.30( 0.29) 0.98   59402.9   10400.00
    22    44933.57  144.73    0.883  0.30( 0.29) 0.98   60715.0   12010.00
    23    43477.66  150.71    0.867  0.30( 0.29) 0.98   61031.6   10210.00
    24    39374.23  177.03    0.799  0.30( 0.29) 0.98   61763.6   10100.00
   TOTAL AREA(ACRES) =     61763.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    50659.48  Tc(MIN.) =  100.181
 EFFECTIVE AREA(ACRES) =  45395.88  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    61763.6
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13408.00 =  123169.36 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13408.00 TO NODE  13410.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    182.00  DOWNSTREAM(FEET) =    178.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =   952.73   CHANNEL SLOPE =  0.0034
 GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  13.46
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.032
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        3.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   50660.57
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.09
 AVERAGE FLOW DEPTH(FEET) =  13.46   TRAVEL TIME(MIN.) =   1.13
 Tc(MIN.) =  101.31
 SUBAREA AREA(ACRES) =     3.31       SUBAREA RUNOFF(CFS) =    2.18
```

EFFECTIVE AREA(ACRES) = 45399.19 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 61766.9 PEAK FLOW RATE(CFS) = 50659.48
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 13.46 FLOW VELOCITY(FEET/SEC.) = 14.09
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27539.27	17.14	2.706	0.30(0.29)	0.98	3565.6	21100.00
2	29188.71	20.94	2.353	0.30(0.29)	0.98	4612.9	50700.00
3	30140.74	23.25	2.205	0.30(0.29)	0.98	5220.3	50600.00
4	30791.62	25.93	2.051	0.30(0.29)	0.98	5985.5	50500.00
5	33242.67	33.13	1.789	0.30(0.29)	0.97	8046.4	30600.00
6	36409.06	40.49	1.603	0.30(0.29)	0.97	11317.9	30200.00
7	38078.89	44.64	1.514	0.30(0.29)	0.97	13376.8	30110.00
8	39767.20	50.70	1.390	0.30(0.29)	0.97	16464.5	31810.00
9	40434.84	54.17	1.352	0.30(0.29)	0.97	18315.2	31400.00
10	42372.12	63.81	1.261	0.30(0.29)	0.96	23244.8	13100.00
11	44036.03	70.34	1.217	0.30(0.29)	0.96	26162.5	11801.00
12	46367.44	79.65	1.154	0.30(0.29)	0.97	30937.7	11530.00
13	48754.21	90.13	1.083	0.30(0.29)	0.97	37744.9	13010.00
14	49921.27	95.03	1.061	0.30(0.29)	0.97	40968.8	11330.00
15	50659.48	101.31	1.032	0.30(0.29)	0.97	45399.2	11130.00
16	50188.70	108.92	0.998	0.30(0.29)	0.98	49389.4	12330.00
17	49638.85	115.59	0.967	0.30(0.29)	0.98	52732.5	12400.00
18	48720.46	124.31	0.936	0.30(0.29)	0.98	56099.8	12201.00
19	48114.42	128.31	0.925	0.30(0.29)	0.98	57186.1	12111.00
20	47310.18	133.73	0.911	0.30(0.29)	0.98	58555.5	12101.10
21	46675.49	137.79	0.901	0.30(0.29)	0.98	59406.2	10400.00
22	44933.57	145.90	0.880	0.30(0.29)	0.98	60718.3	12010.00
23	43477.66	151.89	0.864	0.30(0.29)	0.98	61034.9	10210.00
24	39374.23	178.25	0.796	0.30(0.29)	0.98	61766.9	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 50659.48 Tc(MIN.) = 101.31
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 45399.19

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
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****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 3 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: S36.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3369.82	20.06	0.30(0.30)	0.99	1283.2	21000.00
2	3447.96	22.63	0.30(0.30)	0.99	1467.5	20810.00
3	3461.47	22.94	0.30(0.30)	0.99	1492.5	20900.00
4	3549.79	25.39	0.30(0.30)	0.99	1681.6	20800.00
5	3536.32	27.04	0.30(0.30)	0.99	1795.8	20700.00
6	3573.11	34.41	0.30(0.30)	0.99	2309.7	20600.00
7	3567.91	39.52	0.30(0.30)	0.99	2629.8	20500.00
8	3519.35	41.73	0.30(0.30)	0.99	2729.0	20400.00
9	3506.31	42.12	0.30(0.30)	0.99	2741.8	20300.00
10	3466.76	44.61	0.30(0.30)	0.99	2819.8	20210.00
11	3465.93	44.70	0.30(0.30)	0.99	2823.3	20200.00
12	3442.02	46.31	0.30(0.30)	0.99	2878.8	20100.00
13	3352.63	50.73	0.30(0.30)	0.98	3021.9	13600.00
14	3067.43	85.03	0.30(0.29)	0.98	4004.9	13510.00
15	2923.76	93.41	0.30(0.29)	0.97	4067.7	13500.00

TOTAL AREA(ACRES) = 4067.7

****
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27539.27	17.14	2.706	0.30(0.29)	0.98	3565.6	21100.00
2	29188.71	20.94	2.353	0.30(0.29)	0.98	4612.9	50700.00
3	30140.74	23.25	2.205	0.30(0.29)	0.98	5220.3	50600.00
4	30791.62	25.93	2.051	0.30(0.29)	0.98	5985.5	50500.00
5	33242.67	33.13	1.789	0.30(0.29)	0.97	8046.4	30600.00
6	36409.06	40.49	1.603	0.30(0.29)	0.97	11317.9	30200.00
7	38078.89	44.64	1.514	0.30(0.29)	0.97	13376.8	30110.00
8	39767.20	50.70	1.390	0.30(0.29)	0.97	16464.5	31810.00
9	40434.84	54.17	1.352	0.30(0.29)	0.97	18315.2	31400.00
10	42372.12	63.81	1.261	0.30(0.29)	0.96	23244.8	13100.00
11	44036.03	70.34	1.217	0.30(0.29)	0.96	26162.5	11801.00
12	46367.44	79.65	1.154	0.30(0.29)	0.97	30937.7	11530.00
13	48754.21	90.13	1.083	0.30(0.29)	0.97	37744.9	13010.00
14	49921.27	95.03	1.061	0.30(0.29)	0.97	40968.8	11330.00
15	50659.48	101.31	1.032	0.30(0.29)	0.97	45399.2	11130.00
16	50188.70	108.92	0.998	0.30(0.29)	0.98	49389.4	12330.00
17	49638.85	115.59	0.967	0.30(0.29)	0.98	52732.5	12400.00
18	48720.46	124.31	0.936	0.30(0.29)	0.98	56099.8	12201.00
19	48114.42	128.31	0.925	0.30(0.29)	0.98	57186.1	12111.00
20	47310.18	133.73	0.911	0.30(0.29)	0.98	58555.5	12101.10
21	46675.49	137.79	0.901	0.30(0.29)	0.98	59406.2	10400.00
22	44933.57	145.90	0.880	0.30(0.29)	0.98	60718.3	12010.00
23	43477.66	151.89	0.864	0.30(0.29)	0.98	61034.9	10210.00
24	39374.23	178.25	0.796	0.30(0.29)	0.98	61766.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3369.82	20.06	2.410	0.30(0.30)	0.99	1283.2	21000.00
2	3447.96	22.63	2.244	0.30(0.30)	0.99	1467.5	20810.00

3	3461.47	22.94	2.225	0.30(0.30)	0.99	1492.5	20900.00
4	3549.79	25.39	2.075	0.30(0.30)	0.99	1681.6	20800.00
5	3536.32	27.04	2.001	0.30(0.30)	0.99	1795.8	20700.00
6	3573.11	34.41	1.757	0.30(0.30)	0.99	2309.7	20600.00
7	3567.91	39.52	1.626	0.30(0.30)	0.99	2629.8	20500.00
8	3519.35	41.73	1.577	0.30(0.30)	0.99	2729.0	20400.00
9	3506.31	42.12	1.568	0.30(0.30)	0.99	2741.8	20300.00
10	3466.76	44.61	1.514	0.30(0.30)	0.99	2819.8	20210.00
11	3465.93	44.70	1.512	0.30(0.30)	0.99	2823.3	20200.00
12	3442.02	46.31	1.478	0.30(0.30)	0.99	2878.8	20100.00
13	3352.63	50.73	1.390	0.30(0.30)	0.98	3021.9	13600.00
14	3067.43	85.03	1.118	0.30(0.29)	0.98	4004.9	13510.00
15	2923.76	93.41	1.068	0.30(0.29)	0.97	4067.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30821.93	17.14	2.706	0.30(0.29)	0.98	4661.9	21100.00
2	32176.25	20.06	2.410	0.30(0.29)	0.98	5653.3	21000.00
3	32585.29	20.94	2.353	0.30(0.29)	0.98	5959.2	50700.00
4	33334.21	22.63	2.244	0.30(0.29)	0.98	6525.4	20810.00
5	33472.45	22.94	2.225	0.30(0.29)	0.98	6630.0	20900.00
6	33613.54	23.25	2.205	0.30(0.29)	0.98	6737.1	50600.00
7	34209.70	25.39	2.075	0.30(0.29)	0.98	7512.2	20800.00
8	34336.98	25.93	2.051	0.30(0.29)	0.98	7704.6	50500.00
9	34705.48	27.04	2.001	0.30(0.29)	0.98	8098.7	20700.00
10	36809.37	33.13	1.789	0.30(0.29)	0.98	10266.5	30600.00
11	37367.91	34.41	1.757	0.30(0.29)	0.98	10926.5	20600.00
12	39560.30	39.52	1.626	0.30(0.29)	0.98	13517.2	20500.00
13	39955.69	40.49	1.603	0.30(0.29)	0.98	13991.2	30200.00
14	40428.97	41.73	1.577	0.30(0.29)	0.98	14664.1	20400.00
15	40572.92	42.12	1.568	0.30(0.29)	0.97	14870.5	20300.00
16	41534.49	44.61	1.514	0.30(0.29)	0.97	16182.8	20210.00
17	41545.41	44.64	1.514	0.30(0.29)	0.97	16197.6	30110.00
18	41563.37	44.70	1.512	0.30(0.29)	0.97	16234.1	20200.00
19	41986.26	46.31	1.478	0.30(0.29)	0.97	17106.7	20100.00
20	43120.32	50.70	1.390	0.30(0.29)	0.97	19485.7	31810.00
21	43124.54	50.73	1.390	0.30(0.29)	0.97	19499.5	13600.00
22	43758.85	54.17	1.352	0.30(0.29)	0.97	21435.7	31400.00
23	45615.95	63.81	1.261	0.30(0.29)	0.97	26641.8	13100.00
24	47225.56	70.34	1.217	0.30(0.29)	0.97	29746.5	11801.00
25	49479.62	79.65	1.154	0.30(0.29)	0.97	34788.3	11530.00
26	50660.06	85.03	1.118	0.30(0.29)	0.97	38436.9	13510.00
27	51734.21	90.13	1.083	0.30(0.29)	0.97	41788.1	13010.00
28	52460.18	93.41	1.068	0.30(0.29)	0.97	43973.4	13500.00
29	52817.26	95.03	1.061	0.30(0.29)	0.97	45036.6	11330.00
30	53447.40	101.31	1.032	0.30(0.29)	0.97	49466.9	11130.00
31	52845.76	108.92	0.998	0.30(0.29)	0.98	53457.1	12330.00
32	52181.11	115.59	0.967	0.30(0.29)	0.98	56800.2	12400.00
33	51144.68	124.31	0.936	0.30(0.29)	0.98	60167.6	12201.00
34	50499.48	128.31	0.925	0.30(0.29)	0.98	61253.8	12111.00
35	49642.18	133.73	0.911	0.30(0.29)	0.98	62623.2	12101.10
36	48967.72	137.79	0.901	0.30(0.29)	0.98	63473.9	10400.00
37	47146.36	145.90	0.880	0.30(0.29)	0.98	64786.1	12010.00
38	45631.75	151.89	0.864	0.30(0.29)	0.98	65102.6	10210.00
39	41270.19	178.25	0.796	0.30(0.29)	0.98	65834.6	10100.00

TOTAL AREA(ACRES) = 65834.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 53447.40 Tc(MIN.) = 101.308
EFFECTIVE AREA(ACRES) = 49466.93 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 65834.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

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FLOW PROCESS FROM NODE 13410.00 TO NODE 13412.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 178.72 DOWNSTREAM(FEET) = 176.93
CHANNEL LENGTH THRU SUBAREA(FEET) = 169.78 CHANNEL SLOPE = 0.0105
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.15
CHANNEL FLOW THRU SUBAREA(CFS) = 53447.40
FLOW VELOCITY(FEET/SEC.) = 21.00 FLOW DEPTH(FEET) = 10.15
TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 101.44
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30821.93	17.30	2.690	0.30(0.29)	0.98	4661.9	21100.00
2	32176.25	20.22	2.400	0.30(0.29)	0.98	5653.3	21000.00
3	32585.29	21.10	2.343	0.30(0.29)	0.98	5959.2	50700.00
4	33334.21	22.79	2.234	0.30(0.29)	0.98	6525.4	20810.00
5	33472.45	23.09	2.215	0.30(0.29)	0.98	6630.0	20900.00
6	33613.54	23.41	2.195	0.30(0.29)	0.98	6737.1	50600.00
7	34209.70	25.54	2.068	0.30(0.29)	0.98	7512.2	20800.00
8	34336.98	26.09	2.044	0.30(0.29)	0.98	7704.6	50500.00
9	34705.48	27.19	1.994	0.30(0.29)	0.98	8098.7	20700.00
10	36809.37	33.28	1.785	0.30(0.29)	0.98	10266.5	30600.00
11	37367.91	34.56	1.753	0.30(0.29)	0.98	10926.5	20600.00
12	39560.30	39.67	1.622	0.30(0.29)	0.98	13517.2	20500.00
13	39955.69	40.64	1.600	0.30(0.29)	0.98	13991.2	30200.00
14	40428.97	41.88	1.573	0.30(0.29)	0.98	14664.1	20400.00
15	40572.92	42.27	1.565	0.30(0.29)	0.97	14870.5	20300.00
16	41534.49	44.76	1.511	0.30(0.29)	0.97	16182.8	20210.00
17	41545.41	44.78	1.511	0.30(0.29)	0.97	16197.6	30110.00
18	41563.37	44.85	1.509	0.30(0.29)	0.97	16234.1	20200.00
19	41986.26	46.46	1.475	0.30(0.29)	0.97	17106.7	20100.00
20	43120.32	50.85	1.389	0.30(0.29)	0.97	19485.7	31810.00
21	43124.54	50.87	1.388	0.30(0.29)	0.97	19499.5	13600.00
22	43758.85	54.32	1.350	0.30(0.29)	0.97	21435.7	31400.00
23	45615.95	63.96	1.260	0.30(0.29)	0.97	26641.8	13100.00
24	47225.56	70.48	1.216	0.30(0.29)	0.97	29746.5	11801.00
25	49479.62	79.78	1.153	0.30(0.29)	0.97	34788.3	11530.00
26	50660.06	85.16	1.117	0.30(0.29)	0.97	38436.9	13510.00
27	51734.21	90.27	1.083	0.30(0.29)	0.97	41788.1	13010.00
28	52460.18	93.55	1.068	0.30(0.29)	0.97	43973.4	13500.00
29	52817.26	95.16	1.060	0.30(0.29)	0.97	45036.6	11330.00
30	53447.40	101.44	1.032	0.30(0.29)	0.97	49466.9	11130.00
31	52845.76	109.05	0.997	0.30(0.29)	0.98	53457.1	12330.00

32	52181.11	115.73	0.967	0.30(0.29)	0.98	56800.2	12400.00
33	51144.68	124.45	0.935	0.30(0.29)	0.98	60167.6	12201.00
34	50499.48	128.44	0.925	0.30(0.29)	0.98	61253.8	12111.00
35	49642.18	133.86	0.911	0.30(0.29)	0.98	62623.2	12101.10
36	48967.72	137.93	0.900	0.30(0.29)	0.98	63473.9	10400.00
37	47146.36	146.04	0.879	0.30(0.29)	0.98	64786.1	12010.00
38	45631.75	152.04	0.864	0.30(0.29)	0.98	65102.6	10210.00
39	41270.19	178.40	0.795	0.30(0.29)	0.98	65834.6	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 53447.40 Tc(MIN.) = 101.44
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 49466.93

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
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****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
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PEAK FLOWRATE TABLE FILE NAME: 0509101Y.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	751.66	35.61	0.30(0.30)	1.00	585.7	10100.00

TOTAL AREA(ACRES) = 585.7

****
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30821.93	17.30	2.690	0.30(0.29)	0.98	4661.9	21100.00
2	32176.25	20.22	2.400	0.30(0.29)	0.98	5653.3	21000.00
3	32585.29	21.10	2.343	0.30(0.29)	0.98	5959.2	50700.00
4	33334.21	22.79	2.234	0.30(0.29)	0.98	6525.4	20810.00
5	33472.45	23.09	2.215	0.30(0.29)	0.98	6630.0	20900.00
6	33613.54	23.41	2.195	0.30(0.29)	0.98	6737.1	50600.00
7	34209.70	25.54	2.068	0.30(0.29)	0.98	7512.2	20800.00
8	34336.98	26.09	2.044	0.30(0.29)	0.98	7704.6	50500.00
9	34705.48	27.19	1.994	0.30(0.29)	0.98	8098.7	20700.00
10	36809.37	33.28	1.785	0.30(0.29)	0.98	10266.5	30600.00
11	37367.91	34.56	1.753	0.30(0.29)	0.98	10926.5	20600.00
12	39560.30	39.67	1.622	0.30(0.29)	0.98	13517.2	20500.00
13	39955.69	40.64	1.600	0.30(0.29)	0.98	13991.2	30200.00
14	40428.97	41.88	1.573	0.30(0.29)	0.98	14664.1	20400.00
15	40572.92	42.27	1.565	0.30(0.29)	0.97	14870.5	20300.00
16	41534.49	44.76	1.511	0.30(0.29)	0.97	16182.8	20210.00
17	41545.41	44.78	1.511	0.30(0.29)	0.97	16197.6	30110.00
18	41563.37	44.85	1.509	0.30(0.29)	0.97	16234.1	20200.00

19	41986.26	46.46	1.475	0.30(0.29)	0.97	17106.7	20100.00
20	43120.32	50.85	1.389	0.30(0.29)	0.97	19485.7	31810.00
21	43124.54	50.87	1.388	0.30(0.29)	0.97	19499.5	13600.00
22	43758.85	54.32	1.350	0.30(0.29)	0.97	21435.7	31400.00
23	45615.95	63.96	1.260	0.30(0.29)	0.97	26641.8	13100.00
24	47225.56	70.48	1.216	0.30(0.29)	0.97	29746.5	11801.00
25	49479.62	79.78	1.153	0.30(0.29)	0.97	34788.3	11530.00
26	50660.06	85.16	1.117	0.30(0.29)	0.97	38436.9	13510.00
27	51734.21	90.27	1.083	0.30(0.29)	0.97	41788.1	13010.00
28	52460.18	93.55	1.068	0.30(0.29)	0.97	43973.4	13500.00
29	52817.26	95.16	1.060	0.30(0.29)	0.97	45036.6	11330.00
30	53447.40	101.44	1.032	0.30(0.29)	0.97	49466.9	11130.00
31	52845.76	109.05	0.997	0.30(0.29)	0.98	53457.1	12330.00
32	52181.11	115.73	0.967	0.30(0.29)	0.98	56800.2	12400.00
33	51144.68	124.45	0.935	0.30(0.29)	0.98	60167.6	12201.00
34	50499.48	128.44	0.925	0.30(0.29)	0.98	61253.8	12111.00
35	49642.18	133.86	0.911	0.30(0.29)	0.98	62623.2	12101.10
36	48967.72	137.93	0.900	0.30(0.29)	0.98	63473.9	10400.00
37	47146.36	146.04	0.879	0.30(0.29)	0.98	64786.1	12010.00
38	45631.75	152.04	0.864	0.30(0.29)	0.98	65102.6	10210.00
39	41270.19	178.40	0.795	0.30(0.29)	0.98	65834.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	751.66	35.61	1.726	0.30(0.30)	1.00	585.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 14724.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31433.97	17.30	2.690	0.30(0.29)	0.98	4946.5	21100.00
2	32804.75	20.22	2.400	0.30(0.29)	0.98	5985.9	21000.00
3	33223.44	21.10	2.343	0.30(0.29)	0.98	6306.2	50700.00
4	33986.75	22.79	2.234	0.30(0.29)	0.98	6900.2	20810.00
5	34126.99	23.09	2.215	0.30(0.29)	0.98	7009.9	20900.00
6	34269.98	23.41	2.195	0.30(0.29)	0.98	7122.1	50600.00
7	34878.11	25.54	2.068	0.30(0.29)	0.98	7932.4	20800.00
8	35010.24	26.09	2.044	0.30(0.29)	0.98	8133.6	50500.00
9	35387.44	27.19	1.994	0.30(0.29)	0.98	8546.0	20700.00
10	37541.10	33.28	1.785	0.30(0.29)	0.98	10813.9	30600.00
11	38111.11	34.56	1.753	0.30(0.29)	0.98	11495.0	20600.00
12	38569.55	35.61	1.726	0.30(0.29)	0.98	12044.0	10100.00
13	40257.38	39.67	1.622	0.30(0.29)	0.98	14103.0	20500.00
14	40641.06	40.64	1.600	0.30(0.29)	0.98	14576.9	30200.00
15	41100.20	41.88	1.573	0.30(0.29)	0.98	15249.9	20400.00
16	41239.72	42.27	1.565	0.30(0.29)	0.98	15456.2	20300.00
17	42173.01	44.76	1.511	0.30(0.29)	0.97	16768.6	20210.00
18	42183.61	44.78	1.511	0.30(0.29)	0.97	16783.4	30110.00
19	42200.82	44.85	1.509	0.30(0.29)	0.97	16819.8	20200.00
20	42605.43	46.46	1.475	0.30(0.29)	0.97	17692.4	20100.00
21	43694.16	50.85	1.389	0.30(0.29)	0.97	20071.4	31810.00
22	43698.23	50.87	1.388	0.30(0.29)	0.97	20085.2	13600.00
23	44312.41	54.32	1.350	0.30(0.29)	0.97	22021.5	31400.00
24	46122.13	63.96	1.260	0.30(0.29)	0.97	27227.5	13100.00
25	47708.47	70.48	1.216	0.30(0.29)	0.97	30332.2	11801.00
26	49929.36	79.78	1.153	0.30(0.29)	0.97	35374.0	11530.00

27	51090.61	85.16	1.117	0.30(0.29)	0.97	39022.6	13510.00
28	52146.87	90.27	1.083	0.30(0.29)	0.97	42373.8	13010.00
29	52864.94	93.55	1.068	0.30(0.29)	0.97	44559.2	13500.00
30	53218.13	95.16	1.060	0.30(0.29)	0.97	45622.3	11330.00
31	53833.15	101.44	1.032	0.30(0.29)	0.97	50052.7	11130.00
32	53213.19	109.05	0.997	0.30(0.29)	0.98	54042.9	12330.00
33	52532.47	115.73	0.967	0.30(0.29)	0.98	57385.9	12400.00
34	51479.66	124.45	0.935	0.30(0.29)	0.98	60753.3	12201.00
35	50828.98	128.44	0.925	0.30(0.29)	0.98	61839.6	12111.00
36	49964.27	133.86	0.911	0.30(0.29)	0.98	63208.9	12101.10
37	49284.23	137.93	0.900	0.30(0.29)	0.98	64059.7	10400.00
38	47451.75	146.04	0.879	0.30(0.29)	0.98	65371.8	12010.00
39	45928.92	152.04	0.864	0.30(0.29)	0.98	65688.3	10210.00
40	41531.23	178.40	0.795	0.30(0.29)	0.98	66420.4	10100.00

TOTAL AREA(ACRES) = 66420.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 53833.15 Tc(MIN.) = 101.443
EFFECTIVE AREA(ACRES) = 50052.65 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 66420.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

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FLOW PROCESS FROM NODE 13412.00 TO NODE 13700.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 176.93 DOWNSTREAM(FEET) = 173.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 260.10 CHANNEL SLOPE = 0.0151
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.21
CHANNEL FLOW THRU SUBAREA(CFS) = 53833.15
FLOW VELOCITY(FEET/SEC.) = 23.77 FLOW DEPTH(FEET) = 9.21
TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 101.63
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31433.97	17.52	2.667	0.30(0.29)	0.98	4946.5	21100.00
2	32804.75	20.44	2.386	0.30(0.29)	0.98	5985.9	21000.00
3	33223.44	21.32	2.329	0.30(0.29)	0.98	6306.2	50700.00
4	33986.75	23.00	2.221	0.30(0.29)	0.98	6900.2	20810.00
5	34126.99	23.31	2.201	0.30(0.29)	0.98	7009.9	20900.00
6	34269.98	23.62	2.181	0.30(0.29)	0.98	7122.1	50600.00
7	34878.11	25.75	2.058	0.30(0.29)	0.98	7932.4	20800.00
8	35010.24	26.30	2.034	0.30(0.29)	0.98	8133.6	50500.00
9	35387.44	27.40	1.985	0.30(0.29)	0.98	8546.0	20700.00
10	37541.10	33.48	1.780	0.30(0.29)	0.98	10813.9	30600.00
11	38111.11	34.77	1.747	0.30(0.29)	0.98	11495.0	20600.00
12	38569.55	35.82	1.721	0.30(0.29)	0.98	12044.0	10100.00
13	40257.38	39.87	1.617	0.30(0.29)	0.98	14103.0	20500.00
14	40641.06	40.84	1.596	0.30(0.29)	0.98	14576.9	30200.00
15	41100.20	42.08	1.569	0.30(0.29)	0.98	15249.9	20400.00
16	41239.72	42.47	1.561	0.30(0.29)	0.98	15456.2	20300.00

17	42173.01	44.95	1.507	0.30(0.29)	0.97	16768.6	20210.00
18	42183.61	44.98	1.506	0.30(0.29)	0.97	16783.4	30110.00
19	42200.82	45.05	1.505	0.30(0.29)	0.97	16819.8	20200.00
20	42605.43	46.65	1.470	0.30(0.29)	0.97	17692.4	20100.00
21	43694.16	51.04	1.386	0.30(0.29)	0.97	20071.4	31810.00
22	43698.23	51.07	1.386	0.30(0.29)	0.97	20085.2	13600.00
23	44312.41	54.51	1.348	0.30(0.29)	0.97	22021.5	31400.00
24	46122.13	64.15	1.259	0.30(0.29)	0.97	27227.5	13100.00
25	47708.47	70.67	1.215	0.30(0.29)	0.97	30332.2	11801.00
26	49929.36	79.97	1.152	0.30(0.29)	0.97	35374.0	11530.00
27	51090.61	85.35	1.115	0.30(0.29)	0.97	39022.6	13510.00
28	52146.87	90.45	1.082	0.30(0.29)	0.97	42373.8	13010.00
29	52864.94	93.73	1.067	0.30(0.29)	0.97	44559.2	13500.00
30	53218.13	95.34	1.060	0.30(0.29)	0.97	45622.3	11330.00
31	53833.15	101.63	1.031	0.30(0.29)	0.97	50052.7	11130.00
32	53213.19	109.23	0.996	0.30(0.29)	0.98	54042.9	12330.00
33	52532.47	115.91	0.966	0.30(0.29)	0.98	57385.9	12400.00
34	51479.66	124.63	0.935	0.30(0.29)	0.98	60753.3	12201.00
35	50828.98	128.63	0.925	0.30(0.29)	0.98	61839.6	12111.00
36	49964.27	134.05	0.910	0.30(0.29)	0.98	63208.9	12101.10
37	49284.23	138.11	0.900	0.30(0.29)	0.98	64059.7	10400.00
38	47451.75	146.23	0.879	0.30(0.29)	0.98	65371.8	12010.00
39	45928.92	152.23	0.863	0.30(0.29)	0.98	65688.3	10210.00
40	41531.23	178.60	0.795	0.30(0.29)	0.98	66420.4	10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 53833.15 Tc(MIN.) = 101.63
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 50052.65

****
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 2 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610508Y.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	246.57	20.47	0.30(0.30)	0.99	131.3	50800.00

TOTAL AREA(ACRES) = 131.3

****
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31433.97	17.52	2.667	0.30(0.29)	0.98	4946.5	21100.00
2	32804.75	20.44	2.386	0.30(0.29)	0.98	5985.9	21000.00

3	33223.44	21.32	2.329	0.30(0.29)	0.98	6306.2	50700.00
4	33986.75	23.00	2.221	0.30(0.29)	0.98	6900.2	20810.00
5	34126.99	23.31	2.201	0.30(0.29)	0.98	7009.9	20900.00
6	34269.98	23.62	2.181	0.30(0.29)	0.98	7122.1	50600.00
7	34878.11	25.75	2.058	0.30(0.29)	0.98	7932.4	20800.00
8	35010.24	26.30	2.034	0.30(0.29)	0.98	8133.6	50500.00
9	35387.44	27.40	1.985	0.30(0.29)	0.98	8546.0	20700.00
10	37541.10	33.48	1.780	0.30(0.29)	0.98	10813.9	30600.00
11	38111.11	34.77	1.747	0.30(0.29)	0.98	11495.0	20600.00
12	38569.55	35.82	1.721	0.30(0.29)	0.98	12044.0	10100.00
13	40257.38	39.87	1.617	0.30(0.29)	0.98	14103.0	20500.00
14	40641.06	40.84	1.596	0.30(0.29)	0.98	14576.9	30200.00
15	41100.20	42.08	1.569	0.30(0.29)	0.98	15249.9	20400.00
16	41239.72	42.47	1.561	0.30(0.29)	0.98	15456.2	20300.00
17	42173.01	44.95	1.507	0.30(0.29)	0.97	16768.6	20210.00
18	42183.61	44.98	1.506	0.30(0.29)	0.97	16783.4	30110.00
19	42200.82	45.05	1.505	0.30(0.29)	0.97	16819.8	20200.00
20	42605.43	46.65	1.470	0.30(0.29)	0.97	17692.4	20100.00
21	43694.16	51.04	1.386	0.30(0.29)	0.97	20071.4	31810.00
22	43698.23	51.07	1.386	0.30(0.29)	0.97	20085.2	13600.00
23	44312.41	54.51	1.348	0.30(0.29)	0.97	22021.5	31400.00
24	46122.13	64.15	1.259	0.30(0.29)	0.97	27227.5	13100.00
25	47708.47	70.67	1.215	0.30(0.29)	0.97	30332.2	11801.00
26	49929.36	79.97	1.152	0.30(0.29)	0.97	35374.0	11530.00
27	51090.61	85.35	1.115	0.30(0.29)	0.97	39022.6	13510.00
28	52146.87	90.45	1.082	0.30(0.29)	0.97	42373.8	13010.00
29	52864.94	93.73	1.067	0.30(0.29)	0.97	44559.2	13500.00
30	53218.13	95.34	1.060	0.30(0.29)	0.97	45622.3	11330.00
31	53833.15	101.63	1.031	0.30(0.29)	0.97	50052.7	11130.00
32	53213.19	109.23	0.996	0.30(0.29)	0.98	54042.9	12330.00
33	52532.47	115.91	0.966	0.30(0.29)	0.98	57385.9	12400.00
34	51479.66	124.63	0.935	0.30(0.29)	0.98	60753.3	12201.00
35	50828.98	128.63	0.925	0.30(0.29)	0.98	61839.6	12111.00
36	49964.27	134.05	0.910	0.30(0.29)	0.98	63208.9	12101.10
37	49284.23	138.11	0.900	0.30(0.29)	0.98	64059.7	10400.00
38	47451.75	146.23	0.879	0.30(0.29)	0.98	65371.8	12010.00
39	45928.92	152.23	0.863	0.30(0.29)	0.98	65688.3	10210.00
40	41531.23	178.60	0.795	0.30(0.29)	0.98	66420.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	246.57	20.47	2.384	0.30(0.30)	0.99	131.3	50800.00

LONGEST FLOWPATH FROM NODE 50800.00 TO NODE 13700.00 = 5946.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31673.70	17.52	2.667	0.30(0.29)	0.98	5058.9	21100.00
2	33051.17	20.44	2.386	0.30(0.29)	0.98	6116.9	21000.00
3	33067.00	20.47	2.384	0.30(0.29)	0.98	6129.2	50800.00
4	33463.57	21.32	2.329	0.30(0.29)	0.98	6437.5	50700.00
5	34214.04	23.00	2.221	0.30(0.29)	0.98	7031.5	20810.00
6	34351.98	23.31	2.201	0.30(0.29)	0.98	7141.1	20900.00
7	34492.58	23.62	2.181	0.30(0.29)	0.98	7253.3	50600.00
8	35086.23	25.75	2.058	0.30(0.29)	0.98	8063.6	20800.00
9	35215.50	26.30	2.034	0.30(0.29)	0.98	8264.9	50500.00

10	35586.87	27.40	1.985	0.30(0.29)	0.98	8677.2	20700.00
11	37716.36	33.48	1.780	0.30(0.29)	0.98	10945.1	30600.00
12	38282.51	34.77	1.747	0.30(0.29)	0.98	11626.2	20600.00
13	38737.79	35.82	1.721	0.30(0.29)	0.98	12175.2	10100.00
14	40413.39	39.87	1.617	0.30(0.29)	0.98	14234.2	20500.00
15	40794.54	40.84	1.596	0.30(0.29)	0.98	14708.2	30200.00
16	41250.52	42.08	1.569	0.30(0.29)	0.98	15381.1	20400.00
17	41389.05	42.47	1.561	0.30(0.29)	0.98	15587.5	20300.00
18	42316.00	44.95	1.507	0.30(0.29)	0.97	16899.8	20210.00
19	42326.54	44.98	1.506	0.30(0.29)	0.97	16914.6	30110.00
20	42343.57	45.05	1.505	0.30(0.29)	0.97	16951.1	20200.00
21	42744.09	46.65	1.470	0.30(0.29)	0.97	17823.7	20100.00
22	43822.91	51.04	1.386	0.30(0.29)	0.97	20202.7	31810.00
23	43826.95	51.07	1.386	0.30(0.29)	0.97	20216.5	13600.00
24	44436.62	54.51	1.348	0.30(0.29)	0.97	22152.7	31400.00
25	46235.82	64.15	1.259	0.30(0.29)	0.97	27358.8	13100.00
26	47816.95	70.67	1.215	0.30(0.29)	0.97	30463.5	11801.00
27	50030.41	79.97	1.152	0.30(0.29)	0.97	35505.3	11530.00
28	51187.35	85.35	1.115	0.30(0.29)	0.97	39153.8	13510.00
29	52239.65	90.45	1.082	0.30(0.29)	0.97	42505.1	13010.00
30	52955.95	93.73	1.067	0.30(0.29)	0.97	44690.4	13500.00
31	53308.27	95.34	1.060	0.30(0.29)	0.97	45753.6	11330.00
32	53919.91	101.63	1.031	0.30(0.29)	0.97	50183.9	11130.00
33	53295.84	109.23	0.996	0.30(0.29)	0.98	54174.1	12330.00
34	52611.52	115.91	0.966	0.30(0.29)	0.98	57517.2	12400.00
35	51555.09	124.63	0.935	0.30(0.29)	0.98	60884.6	12201.00
36	50903.18	128.63	0.925	0.30(0.29)	0.98	61970.8	12111.00
37	50036.79	134.05	0.910	0.30(0.29)	0.98	63340.2	12101.10
38	49355.52	138.11	0.900	0.30(0.29)	0.98	64190.9	10400.00
39	47520.54	146.23	0.879	0.30(0.29)	0.98	65503.1	12010.00
40	45995.87	152.23	0.863	0.30(0.29)	0.98	65819.6	10210.00
41	41590.08	178.60	0.795	0.30(0.29)	0.98	66551.6	10100.00

TOTAL AREA(ACRES) = 66551.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 53919.91 Tc(MIN.) = 101.625
EFFECTIVE AREA(ACRES) = 50183.92 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 66551.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 66551.6 TC(MIN.) = 101.63
EFFECTIVE AREA(ACRES) = 50183.92 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.974
PEAK FLOW RATE(CFS) = 53919.91

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31673.70	17.52	2.667	0.30(0.29)	0.98	5058.9	21100.00
2	33051.17	20.44	2.386	0.30(0.29)	0.98	6116.9	21000.00
3	33067.00	20.47	2.384	0.30(0.29)	0.98	6129.2	50800.00
4	33463.57	21.32	2.329	0.30(0.29)	0.98	6437.5	50700.00
5	34214.04	23.00	2.221	0.30(0.29)	0.98	7031.5	20810.00
6	34351.98	23.31	2.201	0.30(0.29)	0.98	7141.1	20900.00
7	34492.58	23.62	2.181	0.30(0.29)	0.98	7253.3	50600.00
8	35086.23	25.75	2.058	0.30(0.29)	0.98	8063.6	20800.00

9	35215.50	26.30	2.034	0.30(0.29)	0.98	8264.9	50500.00
10	35586.87	27.40	1.985	0.30(0.29)	0.98	8677.2	20700.00
11	37716.36	33.48	1.780	0.30(0.29)	0.98	10945.1	30600.00
12	38282.51	34.77	1.747	0.30(0.29)	0.98	11626.2	20600.00
13	38737.79	35.82	1.721	0.30(0.29)	0.98	12175.2	10100.00
14	40413.39	39.87	1.617	0.30(0.29)	0.98	14234.2	20500.00
15	40794.54	40.84	1.596	0.30(0.29)	0.98	14708.2	30200.00
16	41250.52	42.08	1.569	0.30(0.29)	0.98	15381.1	20400.00
17	41389.05	42.47	1.561	0.30(0.29)	0.98	15587.5	20300.00
18	42316.00	44.95	1.507	0.30(0.29)	0.97	16899.8	20210.00
19	42326.54	44.98	1.506	0.30(0.29)	0.97	16914.6	30110.00
20	42343.57	45.05	1.505	0.30(0.29)	0.97	16951.1	20200.00
21	42744.09	46.65	1.470	0.30(0.29)	0.97	17823.7	20100.00
22	43822.91	51.04	1.386	0.30(0.29)	0.97	20202.7	31810.00
23	43826.95	51.07	1.386	0.30(0.29)	0.97	20216.5	13600.00
24	44436.62	54.51	1.348	0.30(0.29)	0.97	22152.7	31400.00
25	46235.82	64.15	1.259	0.30(0.29)	0.97	27358.8	13100.00
26	47816.95	70.67	1.215	0.30(0.29)	0.97	30463.5	11801.00
27	50030.41	79.97	1.152	0.30(0.29)	0.97	35505.3	11530.00
28	51187.35	85.35	1.115	0.30(0.29)	0.97	39153.8	13510.00
29	52239.65	90.45	1.082	0.30(0.29)	0.97	42505.1	13010.00
30	52955.95	93.73	1.067	0.30(0.29)	0.97	44690.4	13500.00
31	53308.27	95.34	1.060	0.30(0.29)	0.97	45753.6	11330.00
32	53919.91	101.63	1.031	0.30(0.29)	0.97	50183.9	11130.00
33	53295.84	109.23	0.996	0.30(0.29)	0.98	54174.1	12330.00
34	52611.52	115.91	0.966	0.30(0.29)	0.98	57517.2	12400.00
35	51555.09	124.63	0.935	0.30(0.29)	0.98	60884.6	12201.00
36	50903.18	128.63	0.925	0.30(0.29)	0.98	61970.8	12111.00
37	50036.79	134.05	0.910	0.30(0.29)	0.98	63340.2	12101.10
38	49355.52	138.11	0.900	0.30(0.29)	0.98	64190.9	10400.00
39	47520.54	146.23	0.879	0.30(0.29)	0.98	65503.1	12010.00
40	45995.87	152.23	0.863	0.30(0.29)	0.98	65819.6	10210.00
41	41590.08	178.60	0.795	0.30(0.29)	0.98	66551.6	10100.00

END OF RATIONAL METHOD ANALYSIS

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**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S35.DAT
  TIME/DATE OF STUDY: 08:15 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  4.800
   2)   10.00;  3.258
   3)   15.00;  2.590
   4)   20.00;  2.201
   5)   25.00;  1.940
   6)   30.00;  1.740
   7)   40.00;  1.487
   8)   50.00;  1.310
   9)   60.00;  1.150
  10)   90.00;  0.940
  11)  120.00;  0.798
  12)  180.00;  0.647
  13)  360.00;  0.452
  14) 1440.00;  0.187
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13500.00 TO NODE  13500.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   548.43
  ELEVATION DATA: UPSTREAM(FEET) =   1183.47  DOWNSTREAM(FEET) =   1065.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.955
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.997
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        5.11      0.30     1.000     0   11.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.40
  TOTAL AREA(ACRES) =      5.11   PEAK FLOW RATE(CFS) =     12.40

**************************************************************************
  FLOW PROCESS FROM NODE  13500.50 TO NODE  13501.00 IS CODE =  56
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1065.00  DOWNSTREAM(FEET) =   1033.15
  CHANNEL LENGTH THRU SUBAREA(FEET) =   431.71   CHANNEL SLOPE =  0.0738
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.755
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        8.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.98
  AVERAGE FLOW DEPTH(FEET) =   0.51   TRAVEL TIME(MIN.) =   1.81
  Tc(MIN.) =   13.76
  SUBAREA AREA(ACRES) =     8.87       SUBAREA RUNOFF(CFS) =   19.60
  EFFECTIVE AREA(ACRES) =     13.98     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.0          PEAK FLOW RATE(CFS) =      30.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   4.47
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13501.00 =     980.14 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13501.00 TO NODE  13502.00 IS CODE =  56
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1033.15  DOWNSTREAM(FEET) =    990.26
  CHANNEL LENGTH THRU SUBAREA(FEET) =   948.63   CHANNEL SLOPE =  0.0452
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.406
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       16.82      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.39
  AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =   17.37
  SUBAREA AREA(ACRES) =    16.82       SUBAREA RUNOFF(CFS) =   31.88
  EFFECTIVE AREA(ACRES) =     30.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       30.8         PEAK FLOW RATE(CFS) =      58.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   4.72
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13502.00 =    1928.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13502.00 TO NODE  13503.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.26  DOWNSTREAM(FEET) =    956.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.98   CHANNEL SLOPE =  0.0363
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.180
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       46.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      97.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.16
  AVERAGE FLOW DEPTH(FEET) =   1.46   TRAVEL TIME(MIN.) =   3.04
  Tc(MIN.) =   20.41
  SUBAREA AREA(ACRES) =    46.02       SUBAREA RUNOFF(CFS) =   77.86
  EFFECTIVE AREA(ACRES) =     76.82     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       76.8         PEAK FLOW RATE(CFS) =     129.97
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.71   FLOW VELOCITY(FEET/SEC.) =   5.65
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13503.00 =    2869.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13503.00 TO NODE  13504.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    956.06  DOWNSTREAM(FEET) =    889.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2131.31   CHANNEL SLOPE =  0.0312
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.879
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       58.46      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     171.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.81
  AVERAGE FLOW DEPTH(FEET) =   2.09   TRAVEL TIME(MIN.) =   6.12
  Tc(MIN.) =   26.52
  SUBAREA AREA(ACRES) =    58.46       SUBAREA RUNOFF(CFS) =   83.08
  EFFECTIVE AREA(ACRES) =    135.28     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      135.3         PEAK FLOW RATE(CFS) =     192.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.22   FLOW VELOCITY(FEET/SEC.) =   6.01
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13504.00 =    5001.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13504.00 TO NODE  13505.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    889.48  DOWNSTREAM(FEET) =    848.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1661.97   CHANNEL SLOPE =  0.0249
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.707
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       49.30      0.30     1.000     -
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     223.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.80
  AVERAGE FLOW DEPTH(FEET) =   2.55   TRAVEL TIME(MIN.) =   4.78
  Tc(MIN.) =   31.30
  SUBAREA AREA(ACRES) =    49.30       SUBAREA RUNOFF(CFS) =   62.43
  EFFECTIVE AREA(ACRES) =    184.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      184.6          PEAK FLOW RATE(CFS) =     233.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.62   FLOW VELOCITY(FEET/SEC.) =   5.85
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.00 =    6663.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.00 TO NODE  13505.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    848.10  DOWNSTREAM(FEET) =    811.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1234.61   CHANNEL SLOPE =  0.0300
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.626
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.35      0.30     0.811     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.811
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     258.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.44
  AVERAGE FLOW DEPTH(FEET) =   2.63   TRAVEL TIME(MIN.) =   3.19
  Tc(MIN.) =   34.50
  SUBAREA AREA(ACRES) =    39.35       SUBAREA RUNOFF(CFS) =   48.98
  EFFECTIVE AREA(ACRES) =    223.93     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      223.9          PEAK FLOW RATE(CFS) =     269.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.69   FLOW VELOCITY(FEET/SEC.) =   6.51
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13505.50 =    7897.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13505.50 TO NODE  13506.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =    811.10  DOWNSTREAM(FEET) =    781.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1415.98   CHANNEL SLOPE =  0.0213
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.526
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       54.33      0.30     0.738     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.738
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     301.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.95
  AVERAGE FLOW DEPTH(FEET) =   3.12   TRAVEL TIME(MIN.) =   3.97
  Tc(MIN.) =   38.46
  SUBAREA AREA(ACRES) =    54.33       SUBAREA RUNOFF(CFS) =   63.79
  EFFECTIVE AREA(ACRES) =    278.26     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.92
  TOTAL AREA(ACRES) =      278.3          PEAK FLOW RATE(CFS) =     312.87
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.18   FLOW VELOCITY(FEET/SEC.) =   6.02
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.00 =    9313.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13506.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    781.00  DOWNSTREAM(FEET) =    743.17
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1542.62   CHANNEL SLOPE =  0.0245
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.444
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.33      0.30     0.783     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.783
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     346.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.51
  AVERAGE FLOW DEPTH(FEET) =   3.23   TRAVEL TIME(MIN.) =   3.95
  Tc(MIN.) =   42.41
  SUBAREA AREA(ACRES) =    61.33       SUBAREA RUNOFF(CFS) =   66.76
  EFFECTIVE AREA(ACRES) =    339.59     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =      339.6          PEAK FLOW RATE(CFS) =     359.20
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.29
```

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  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.29   FLOW VELOCITY(FEET/SEC.) =   6.58
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13506.50 =   10856.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.50 TO NODE  13520.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    743.17  DOWNSTREAM(FEET) =    717.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1370.93   CHANNEL SLOPE =  0.0191
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.62
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.378
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       39.86      0.30     0.848     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.848
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     379.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.09
  AVERAGE FLOW DEPTH(FEET) =   3.61   TRAVEL TIME(MIN.) =   3.75
  Tc(MIN.) =   46.16
  SUBAREA AREA(ACRES) =    39.86       SUBAREA RUNOFF(CFS) =   40.31
  EFFECTIVE AREA(ACRES) =    379.45     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.89
  TOTAL AREA(ACRES) =      379.5         PEAK FLOW RATE(CFS) =     379.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.61   FLOW VELOCITY(FEET/SEC.) =   6.09
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13506.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   46.16
  RAINFALL INTENSITY(INCH/HR) =   1.38
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.89
  EFFECTIVE STREAM AREA(ACRES) =     379.45
  TOTAL STREAM AREA(ACRES) =     379.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     379.23

****************************************************************************
  FLOW PROCESS FROM NODE  13510.00 TO NODE  13511.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```



```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   903.68
  ELEVATION DATA: UPSTREAM(FEET) =   1216.90  DOWNSTREAM(FEET) =   1022.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.615
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.641
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    -        6.66      0.30     1.000     0   14.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     14.03
  TOTAL AREA(ACRES) =      6.66   PEAK FLOW RATE(CFS) =     14.03

****************************************************************************
  FLOW PROCESS FROM NODE  13511.00 TO NODE  13512.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1022.78  DOWNSTREAM(FEET) =    954.27
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1027.63   CHANNEL SLOPE =  0.0667
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.332
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       25.40      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.63
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   3.70
  Tc(MIN.) =   18.31
  SUBAREA AREA(ACRES) =    25.40       SUBAREA RUNOFF(CFS) =   46.46
  EFFECTIVE AREA(ACRES) =     32.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       32.1         PEAK FLOW RATE(CFS) =      58.64
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.92   FLOW VELOCITY(FEET/SEC.) =   5.38
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13512.00 =    1931.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13512.00 TO NODE  13513.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
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```
 ELEVATION DATA: UPSTREAM(FEET) =    954.27  DOWNSTREAM(FEET) =    872.45
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.42   CHANNEL SLOPE =  0.0425
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   1.72
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.007
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       90.23      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     128.25
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.93
 AVERAGE FLOW DEPTH(FEET) =   1.63   TRAVEL TIME(MIN.) =   5.41
 Tc(MIN.) =   23.72
 SUBAREA AREA(ACRES) =    90.23       SUBAREA RUNOFF(CFS) =  138.60
 EFFECTIVE AREA(ACRES) =    122.29     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      122.3         PEAK FLOW RATE(CFS) =     187.84
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.01

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  2.01   FLOW VELOCITY(FEET/SEC.) =   6.66
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13513.00 =    3857.73 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13513.00 TO NODE  13514.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    872.45  DOWNSTREAM(FEET) =    813.12
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1895.66   CHANNEL SLOPE =  0.0313
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   2.77
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.802
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      135.65      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     279.69
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.69
 AVERAGE FLOW DEPTH(FEET) =   2.71   TRAVEL TIME(MIN.) =   4.72
 Tc(MIN.) =   28.45
 SUBAREA AREA(ACRES) =   135.65       SUBAREA RUNOFF(CFS) =  183.40
 EFFECTIVE AREA(ACRES) =    257.94     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      257.9         PEAK FLOW RATE(CFS) =     348.73
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.04
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 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.04   FLOW VELOCITY(FEET/SEC.) =   7.13
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13514.00 =    5753.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13514.00 TO NODE  13515.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    813.12  DOWNSTREAM(FEET) =    773.74
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1926.15   CHANNEL SLOPE =  0.0204
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.75
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.653
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      109.30      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     415.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.41
 AVERAGE FLOW DEPTH(FEET) =   3.72   TRAVEL TIME(MIN.) =   5.01
 Tc(MIN.) =   33.46
 SUBAREA AREA(ACRES) =   109.30       SUBAREA RUNOFF(CFS) =  133.05
 EFFECTIVE AREA(ACRES) =    367.24     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
 TOTAL AREA(ACRES) =      367.2         PEAK FLOW RATE(CFS) =     447.05
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.86   FLOW VELOCITY(FEET/SEC.) =   6.54
 LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13515.00 =    7679.54 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    773.74  DOWNSTREAM(FEET) =    717.04
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2279.49   CHANNEL SLOPE =  0.0249
 GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.22
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.525
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      231.44      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     574.68
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.52
```

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  AVERAGE FLOW DEPTH(FEET) =   4.17   TRAVEL TIME(MIN.) =   5.05
  Tc(MIN.) =   38.51
  SUBAREA AREA(ACRES) =   231.44       SUBAREA RUNOFF(CFS) =  255.11
  EFFECTIVE AREA(ACRES) =    598.68     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      598.7         PEAK FLOW RATE(CFS) =     659.90
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.47   FLOW VELOCITY(FEET/SEC.) =   7.80
  LONGEST FLOWPATH FROM NODE  13510.00 TO NODE  13520.00 =    9959.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13515.00 TO NODE  13520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   38.51
  RAINFALL INTENSITY(INCH/HR) =   1.52
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =     598.68
  TOTAL STREAM AREA(ACRES) =     598.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     659.90

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      379.23   46.16    1.378  0.30( 0.27) 0.89     379.5   13500.00
      2      659.90   38.51    1.525  0.30( 0.30) 1.00     598.7   13510.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1018.09   38.51    1.525  0.30( 0.29) 0.96     915.3   13510.00
      2      960.09   46.16    1.378  0.30( 0.29) 0.96     978.1   13500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1018.09    Tc(MIN.) =    38.51
  EFFECTIVE AREA(ACRES) =     915.25   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =      978.1
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.00 =   12227.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13520.00 TO NODE  13520.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    717.04  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2019.22   CHANNEL SLOPE =  0.0084
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.86
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.428
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      193.31      0.30     0.965     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.965
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1117.17
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.00
  AVERAGE FLOW DEPTH(FEET) =   3.84   TRAVEL TIME(MIN.) =   4.81
  Tc(MIN.) =   43.32
  SUBAREA AREA(ACRES) =   193.31       SUBAREA RUNOFF(CFS) =  198.13
  EFFECTIVE AREA(ACRES) =   1108.56     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
  TOTAL AREA(ACRES) =     1171.4         PEAK FLOW RATE(CFS) =    1136.82
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.88   FLOW VELOCITY(FEET/SEC.) =   7.04
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13520.50 =   14246.39 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1136.82   43.32    1.428  0.30( 0.29) 0.96    1108.6   13510.00
      2     1059.86   51.06    1.293  0.30( 0.29) 0.96    1171.4   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1136.82  Tc(MIN.) =   43.32
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1108.56

****************************************************************************
  FLOW PROCESS FROM NODE  13520.50 TO NODE  13521.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    661.95
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1622.36   CHANNEL SLOPE =  0.0235
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.02
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.381
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      129.79      0.30     0.897     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.897
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1201.79
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 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.20
 AVERAGE FLOW DEPTH(FEET) =   3.02   TRAVEL TIME(MIN.) =   2.65
 Tc(MIN.) =   45.97
 SUBAREA AREA(ACRES) =   129.79       SUBAREA RUNOFF(CFS) =  129.93
 EFFECTIVE AREA(ACRES) =   1238.35     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     1301.2         PEAK FLOW RATE(CFS) =    1219.95
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.04

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.04   FLOW VELOCITY(FEET/SEC.) =  10.25
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13521.00 =   15868.75 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1219.95   45.97    1.381  0.30( 0.29) 0.96    1238.4   13510.00
     2     1128.64   53.78    1.250  0.30( 0.29) 0.95    1301.2   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1219.95  Tc(MIN.) =   45.97
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1238.35

****************************************************************************
 FLOW PROCESS FROM NODE  13521.00 TO NODE  13522.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    661.95  DOWNSTREAM(FEET) =    632.19
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2746.01   CHANNEL SLOPE =  0.0108
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.99
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.284
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      278.60      0.30     0.905     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.905
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1346.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.09
 AVERAGE FLOW DEPTH(FEET) =   3.97   TRAVEL TIME(MIN.) =   5.66
 Tc(MIN.) =   51.63
 SUBAREA AREA(ACRES) =   278.60       SUBAREA RUNOFF(CFS) =  253.89
 EFFECTIVE AREA(ACRES) =   1516.95     AREA-AVERAGED Fm(INCH/HR) =   0.28
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
 TOTAL AREA(ACRES) =     1579.8         PEAK FLOW RATE(CFS) =    1365.32
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.00

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.00   FLOW VELOCITY(FEET/SEC.) =   8.12
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13522.00 =   18614.76 FEET.
```



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 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1365.32   51.63    1.284  0.30( 0.28) 0.95    1517.0   13510.00
     2     1241.92   59.58    1.157  0.30( 0.28) 0.94    1579.8   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1365.32  Tc(MIN.) =   51.63
 AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1516.95
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     1579.8  TC(MIN.) =     51.63
 EFFECTIVE AREA(ACRES) =   1516.95  AREA-AVERAGED Fm(INCH/HR)=  0.28
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.947
 PEAK FLOW RATE(CFS)   =    1365.32

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1365.32   51.63    1.284  0.30( 0.28) 0.95    1517.0   13510.00
     2     1241.92   59.58    1.157  0.30( 0.28) 0.94    1579.8   13500.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:

                      Michael Baker International
                    5 Hutton Centre Drive, Suite 500
                            Santa Ana, CA
                                92707

------------------------------------------------------------------------
  FILE NAME: S36.DAT
  TIME/DATE OF STUDY: 08:15 07/16/2018
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.786
   2)   10.00;  3.745
   3)   15.00;  2.905
   4)   20.00;  2.401
   5)   25.00;  2.083
   6)   30.00;  1.861
   7)   40.00;  1.606
   8)   50.00;  1.392
   9)   60.00;  1.279
  10)   90.00;  1.075
  11)  120.00;  0.938
  12)  180.00;  0.782
  13)  360.00;  0.577
  14) 1200.00;  0.251
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  13600.00 TO NODE  13600.50 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   488.61
  ELEVATION DATA: UPSTREAM(FEET) =    872.12  DOWNSTREAM(FEET) =    744.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.995
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.578
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"                -        3.39      0.30     1.000     0   11.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     10.00
  TOTAL AREA(ACRES) =      3.39   PEAK FLOW RATE(CFS) =     10.00

************************************************************************
  FLOW PROCESS FROM NODE  13600.50 TO NODE  13601.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    744.80  DOWNSTREAM(FEET) =    707.32
  CHANNEL LENGTH THRU SUBAREA(FEET) =   418.30   CHANNEL SLOPE =  0.0896
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.46
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.289
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        7.45      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.06
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   1.72
  Tc(MIN.) =   12.71
  SUBAREA AREA(ACRES) =     7.45       SUBAREA RUNOFF(CFS) =   20.04
  EFFECTIVE AREA(ACRES) =     10.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       10.8          PEAK FLOW RATE(CFS) =      29.16
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   4.67
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13601.00 =     906.91 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  13601.00 TO NODE  13602.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    707.32  DOWNSTREAM(FEET) =    657.12
  CHANNEL LENGTH THRU SUBAREA(FEET) =   777.60   CHANNEL SLOPE =  0.0646
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.899
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       30.96      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.53
  AVERAGE FLOW DEPTH(FEET) =   0.99   TRAVEL TIME(MIN.) =   2.35
  Tc(MIN.) =   15.06
  SUBAREA AREA(ACRES) =    30.96       SUBAREA RUNOFF(CFS) =   72.42
  EFFECTIVE AREA(ACRES) =     41.80     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.8         PEAK FLOW RATE(CFS) =      97.78
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) =   6.28
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13602.00 =    1684.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13602.00 TO NODE  13603.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    657.12  DOWNSTREAM(FEET) =    584.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1186.54   CHANNEL SLOPE =  0.0611
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.598
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.36      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.62
  AVERAGE FLOW DEPTH(FEET) =   1.43   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   18.04
  SUBAREA AREA(ACRES) =    23.36       SUBAREA RUNOFF(CFS) =   48.32
  EFFECTIVE AREA(ACRES) =     65.16     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       65.2         PEAK FLOW RATE(CFS) =     134.78
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.52   FLOW VELOCITY(FEET/SEC.) =   6.83
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13603.00 =    2871.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    584.58  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   860.98   CHANNEL SLOPE =  0.0461
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.384
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.44
  AVERAGE FLOW DEPTH(FEET) =   1.77   TRAVEL TIME(MIN.) =   2.23
  Tc(MIN.) =   20.27
  SUBAREA AREA(ACRES) =    21.24       SUBAREA RUNOFF(CFS) =   39.83
  EFFECTIVE AREA(ACRES) =     86.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       86.4         PEAK FLOW RATE(CFS) =     162.03
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.82   FLOW VELOCITY(FEET/SEC.) =   6.53
  LONGEST FLOWPATH FROM NODE  13600.00 TO NODE  13620.00 =    3732.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S35.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1365.32   51.63  0.30( 0.28) 0.95    1517.0   13510.00
```

```
      2     1241.92   59.58  0.30( 0.28) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =     1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13522.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1365.32   51.63  0.30( 0.28) 0.95    1517.0   13510.00
      2     1241.92   59.58  0.30( 0.28) 0.94    1579.8   13500.00
    TOTAL AREA(ACRES) =      1579.8

****************************************************************************
  FLOW PROCESS FROM NODE  13522.00 TO NODE  13523.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    632.19  DOWNSTREAM(FEET) =    561.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1151.68   CHANNEL SLOPE =  0.0618
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.47
  CHANNEL FLOW THRU SUBAREA(CFS) =    1365.32
  FLOW VELOCITY(FEET/SEC.) =  14.78   FLOW DEPTH(FEET) =   2.47
  TRAVEL TIME(MIN.) =   1.30   Tc(MIN.) =   52.92
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1467.67   52.92    1.359  0.30( 0.28) 0.95    1517.0   13510.00
      2     1406.88   60.92    1.273  0.30( 0.28) 0.94    1579.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1467.67  Tc(MIN.) =   52.92
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1516.95

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610201Y.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM        Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1       93.04   14.28  0.30( 0.30) 1.00      37.9   20100.00
```



```
    TOTAL AREA(ACRES) =       37.9

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13523.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1467.67   52.92    1.359  0.30( 0.28) 0.95    1517.0   13510.00
      2     1406.88   60.92    1.273  0.30( 0.28) 0.94    1579.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       93.04   14.28    3.026  0.30( 0.30) 1.00      37.9   20100.00
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  13523.00 =    2767.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1103.14   14.28    3.026  0.30( 0.29) 0.95     447.3   20100.00
      2     1503.81   52.92    1.359  0.30( 0.28) 0.95    1554.9   13510.00
      3     1440.09   60.92    1.273  0.30( 0.28) 0.95    1617.8   13500.00
    TOTAL AREA(ACRES) =      1617.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1503.81  Tc(MIN.) =   52.924
  EFFECTIVE AREA(ACRES) =   1554.89  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1617.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13523.00 =   19766.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13523.00 TO NODE  13524.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    561.00  DOWNSTREAM(FEET) =    556.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   238.34   CHANNEL SLOPE =  0.0210
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.52
  CHANNEL FLOW THRU SUBAREA(CFS) =    1503.81
  FLOW VELOCITY(FEET/SEC.) =  10.53   FLOW DEPTH(FEET) =   3.52
  TRAVEL TIME(MIN.) =   0.38   Tc(MIN.) =   53.30
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1103.14   14.70    2.956  0.30( 0.29) 0.95     447.3   20100.00
      2     1503.81   53.30    1.355  0.30( 0.28) 0.95    1554.9   13510.00
      3     1440.09   61.30    1.270  0.30( 0.28) 0.95    1617.8   13500.00
```

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1503.81  Tc(MIN.) =   53.30
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1554.89

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610202Y.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       76.85   13.00  0.30( 0.30) 1.00      29.0   20210.00
      2       76.63   13.10  0.30( 0.30) 1.00      29.1   20200.00
    TOTAL AREA(ACRES) =       29.1

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13524.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1103.14   14.70    2.956  0.30( 0.29) 0.95     447.3   20100.00
      2     1503.81   53.30    1.355  0.30( 0.28) 0.95    1554.9   13510.00
      3     1440.09   61.30    1.270  0.30( 0.28) 0.95    1617.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       76.85   13.00    3.241  0.30( 0.30) 1.00      29.0   20210.00
      2       76.63   13.10    3.225  0.30( 0.30) 1.00      29.1   20200.00
  LONGEST FLOWPATH FROM NODE  20210.00 TO NODE  13524.00 =    2247.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1156.72   13.00    3.241  0.30( 0.29) 0.95     424.6   20210.00
      2     1158.62   13.10    3.225  0.30( 0.29) 0.95     427.7   20200.00
      3     1172.72   14.70    2.956  0.30( 0.29) 0.95     476.4   20100.00
      4     1531.45   53.30    1.355  0.30( 0.28) 0.95    1584.0   13510.00
      5     1465.51   61.30    1.270  0.30( 0.28) 0.95    1646.9   13500.00
    TOTAL AREA(ACRES) =      1646.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1531.45  Tc(MIN.) =   53.302
  EFFECTIVE AREA(ACRES) =   1584.00  AREA-AVERAGED Fm(INCH/HR) =  0.28
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  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.95
  TOTAL AREA(ACRES) =     1646.9
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13524.00 =   20004.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13524.00 TO NODE  13620.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    556.00  DOWNSTREAM(FEET) =    544.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =   672.93   CHANNEL SLOPE =  0.0165
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.82
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.342
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.94      0.30     0.884     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.884
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1544.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.76
  AVERAGE FLOW DEPTH(FEET) =   3.82   TRAVEL TIME(MIN.) =   1.15
  Tc(MIN.) =   54.45
  SUBAREA AREA(ACRES) =    27.94       SUBAREA RUNOFF(CFS) =   27.07
  EFFECTIVE AREA(ACRES) =   1611.94     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =     1674.8          PEAK FLOW RATE(CFS) =    1534.05
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.80   FLOW VELOCITY(FEET/SEC.) =   9.74
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13620.00 =   20677.71 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1156.72   14.24    3.032  0.30( 0.28) 0.95     452.5   20210.00
      2     1158.62   14.34    3.016  0.30( 0.29) 0.95     455.7   20200.00
      3     1172.72   15.94    2.811  0.30( 0.29) 0.95     504.3   20100.00
      4     1534.05   54.45    1.342  0.30( 0.28) 0.95    1611.9   13510.00
      5     1475.06   62.46    1.262  0.30( 0.28) 0.95    1674.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1534.05  Tc(MIN.) =   54.45
  AREA-AVERAGED Fm(INCH/HR) =  0.28  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1611.94

****************************************************************************
  FLOW PROCESS FROM NODE  13603.00 TO NODE  13620.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1156.72	14.24	3.032	0.30(0.28)	0.95	452.5	20210.00
2	1158.62	14.34	3.016	0.30(0.29)	0.95	455.7	20200.00
3	1172.72	15.94	2.811	0.30(0.29)	0.95	504.3	20100.00
4	1534.05	54.45	1.342	0.30(0.28)	0.95	1611.9	13510.00
5	1475.06	62.46	1.262	0.30(0.28)	0.95	1674.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.03	20.27	2.384	0.30(0.30)	1.00	86.4	13600.00

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13620.00 = 3732.03 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1305.99	14.24	3.032	0.30(0.29)	0.96	513.2	20210.00
2	1308.02	14.34	3.016	0.30(0.29)	0.96	516.8	20200.00
3	1326.20	15.94	2.811	0.30(0.29)	0.96	572.3	20100.00
4	1375.42	20.27	2.384	0.30(0.29)	0.96	715.4	13600.00
5	1615.06	54.45	1.342	0.30(0.29)	0.95	1698.3	13510.00
6	1549.89	62.46	1.262	0.30(0.28)	0.95	1761.2	13500.00

TOTAL AREA(ACRES) = 1761.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1615.06 Tc(MIN.) = 54.451
EFFECTIVE AREA(ACRES) = 1698.34 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 1761.2
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

****
FLOW PROCESS FROM NODE 13620.00 TO NODE 13621.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 544.91 DOWNSTREAM(FEET) = 527.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 868.57 CHANNEL SLOPE = 0.0206
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.68
CHANNEL FLOW THRU SUBAREA(CFS) = 1615.06
FLOW VELOCITY(FEET/SEC.) = 10.69 FLOW DEPTH(FEET) = 3.68
TRAVEL TIME(MIN.) = 1.35 Tc(MIN.) = 55.81
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1305.99	15.69	2.836	0.30(0.29)	0.96	513.2	20210.00
2	1308.02	15.79	2.826	0.30(0.29)	0.96	516.8	20200.00
3	1326.20	17.37	2.666	0.30(0.29)	0.96	572.3	20100.00
4	1375.42	21.69	2.293	0.30(0.29)	0.96	715.4	13600.00
5	1615.06	55.81	1.326	0.30(0.29)	0.95	1698.3	13510.00
6	1549.89	63.83	1.253	0.30(0.28)	0.95	1761.2	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1615.06 Tc(MIN.) = 55.81
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1698.34

****
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 1 <<<<<
==========

****
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 15.1

>>>>>DEFINE MEMORY BANK # 1 <<<<<
==========
PEAK FLOWRATE TABLE FILE NAME: 0610203Y.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.29	13.31	0.30(0.30)	1.00	27.4	20300.00

TOTAL AREA(ACRES) = 27.4

****
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1305.99	15.69	2.836	0.30(0.29)	0.96	513.2	20210.00
2	1308.02	15.79	2.826	0.30(0.29)	0.96	516.8	20200.00
3	1326.20	17.37	2.666	0.30(0.29)	0.96	572.3	20100.00
4	1375.42	21.69	2.293	0.30(0.29)	0.96	715.4	13600.00
5	1615.06	55.81	1.326	0.30(0.29)	0.95	1698.3	13510.00
6	1549.89	63.83	1.253	0.30(0.28)	0.95	1761.2	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.29	13.31	3.189	0.30(0.30)	1.00	27.4	20300.00

LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 13621.00 = 2609.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1332.80	13.31	3.189	0.30(0.29)	0.96	462.7	20300.00
2	1368.56	15.69	2.836	0.30(0.29)	0.96	540.7	20210.00
3	1370.34	15.79	2.826	0.30(0.29)	0.96	544.2	20200.00
4	1384.57	17.37	2.666	0.30(0.29)	0.96	599.7	20100.00
5	1424.61	21.69	2.293	0.30(0.29)	0.96	742.8	13600.00
6	1640.38	55.81	1.326	0.30(0.29)	0.95	1725.8	13510.00
7	1573.41	63.83	1.253	0.30(0.28)	0.95	1788.6	13500.00

TOTAL AREA(ACRES) = 1788.6

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1640.38  Tc(MIN.) =   55.806
  EFFECTIVE AREA(ACRES) =   1725.77  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1788.6
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13621.00 =   21546.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13621.00 TO NODE  13622.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    527.00  DOWNSTREAM(FEET) =    512.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    56.08   CHANNEL SLOPE =  0.2675
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.81
  CHANNEL FLOW THRU SUBAREA(CFS) =    1640.38
  FLOW VELOCITY(FEET/SEC.) =  25.66   FLOW DEPTH(FEET) =   1.81
  TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =   55.84
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1332.80   13.35    3.183  0.30( 0.29) 0.96     462.7   20300.00
      2     1368.56   15.73    2.832  0.30( 0.29) 0.96     540.7   20210.00
      3     1370.34   15.83    2.822  0.30( 0.29) 0.96     544.2   20200.00
      4     1384.57   17.41    2.662  0.30( 0.29) 0.96     599.7   20100.00
      5     1424.61   21.73    2.291  0.30( 0.29) 0.96     742.8   13600.00
      6     1640.38   55.84    1.326  0.30( 0.29) 0.95    1725.8   13510.00
      7     1573.41   63.87    1.253  0.30( 0.28) 0.95    1788.6   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    1640.38  Tc(MIN.) =   55.84
  AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.95  EFFECTIVE AREA(ACRES) =    1725.77

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610204Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1       85.22   12.98  0.30( 0.30) 1.00      32.2   20400.00
    TOTAL AREA(ACRES) =       32.2

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13622.00 IS CODE =  11
```



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----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1332.80   13.35    3.183  0.30( 0.29) 0.96     462.7   20300.00
      2     1368.56   15.73    2.832  0.30( 0.29) 0.96     540.7   20210.00
      3     1370.34   15.83    2.822  0.30( 0.29) 0.96     544.2   20200.00
      4     1384.57   17.41    2.662  0.30( 0.29) 0.96     599.7   20100.00
      5     1424.61   21.73    2.291  0.30( 0.29) 0.96     742.8   13600.00
      6     1640.38   55.84    1.326  0.30( 0.29) 0.95    1725.8   13510.00
      7     1573.41   63.87    1.253  0.30( 0.28) 0.95    1788.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       85.22   12.98    3.245  0.30( 0.30) 1.00      32.2   20400.00
  LONGEST FLOWPATH FROM NODE  20400.00 TO NODE  13622.00 =    2281.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1408.90   12.98    3.245  0.30( 0.29) 0.96     482.1   20400.00
      2     1416.22   13.35    3.183  0.30( 0.29) 0.96     494.9   20300.00
      3     1441.81   15.73    2.832  0.30( 0.29) 0.96     572.8   20210.00
      4     1443.31   15.83    2.822  0.30( 0.29) 0.96     576.4   20200.00
      5     1452.91   17.41    2.662  0.30( 0.29) 0.96     631.8   20100.00
      6     1482.22   21.73    2.291  0.30( 0.29) 0.96     775.0   13600.00
      7     1670.07   55.84    1.326  0.30( 0.29) 0.95    1757.9   13510.00
      8     1600.98   63.87    1.253  0.30( 0.28) 0.95    1820.8   13500.00
    TOTAL AREA(ACRES) =      1820.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1670.07  Tc(MIN.) =   55.842
  EFFECTIVE AREA(ACRES) =   1757.92  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
  TOTAL AREA(ACRES) =     1820.8
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13622.00 =   21602.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13622.00 TO NODE  13640.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    512.00  DOWNSTREAM(FEET) =    489.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.72   CHANNEL SLOPE =  0.0500
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.99
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.320
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.88      0.30     1.000     -
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 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1721.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  14.80
 AVERAGE FLOW DEPTH(FEET) =   2.99   TRAVEL TIME(MIN.) =   0.52
 Tc(MIN.) =   56.36
 SUBAREA AREA(ACRES) =   112.88       SUBAREA RUNOFF(CFS) =  103.64
 EFFECTIVE AREA(ACRES) =   1870.80     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     1933.7          PEAK FLOW RATE(CFS) =    1740.44
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   3.00

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.00   FLOW VELOCITY(FEET/SEC.) =  14.86
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1533.88   13.51    3.155  0.30( 0.29) 0.97     595.0   20400.00
     2     1533.08   13.88    3.093  0.30( 0.29) 0.97     607.8   20300.00
     3     1535.28   16.26    2.778  0.30( 0.29) 0.97     685.7   20210.00
     4     1537.18   16.36    2.768  0.30( 0.29) 0.97     689.2   20200.00
     5     1553.77   17.95    2.608  0.30( 0.29) 0.97     744.7   20100.00
     6     1572.32   22.26    2.257  0.30( 0.29) 0.96     887.9   13600.00
     7     1740.44   56.36    1.320  0.30( 0.29) 0.96    1870.8   13510.00
     8     1676.40   64.40    1.249  0.30( 0.29) 0.95    1933.7   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1740.44  Tc(MIN.) =   56.36
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    1870.80

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610205Y.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
     1       23.44   11.26  0.30( 0.30) 1.00       8.1   20500.00
   TOTAL AREA(ACRES) =        8.1

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13640.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1533.88   13.51    3.155  0.30( 0.29) 0.97     595.0   20400.00
     2     1533.08   13.88    3.093  0.30( 0.29) 0.97     607.8   20300.00
     3     1535.28   16.26    2.778  0.30( 0.29) 0.97     685.7   20210.00
```



```
     4     1537.18   16.36    2.768  0.30( 0.29) 0.97     689.2   20200.00
     5     1553.77   17.95    2.608  0.30( 0.29) 0.97     744.7   20100.00
     6     1572.32   22.26    2.257  0.30( 0.29) 0.96     887.9   13600.00
     7     1740.44   56.36    1.320  0.30( 0.29) 0.96    1870.8   13510.00
     8     1676.40   64.40    1.249  0.30( 0.29) 0.95    1933.7   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       23.44   11.26    3.534  0.30( 0.30) 1.00       8.1   20500.00
 LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  13640.00 =    1025.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     1470.45   11.26    3.534  0.30( 0.29) 0.97     503.8   20500.00
     2     1554.58   13.51    3.155  0.30( 0.29) 0.97     603.0   20400.00
     3     1553.33   13.88    3.093  0.30( 0.29) 0.97     615.8   20300.00
     4     1553.25   16.26    2.778  0.30( 0.29) 0.97     693.8   20210.00
     5     1555.07   16.36    2.768  0.30( 0.29) 0.97     697.3   20200.00
     6     1570.51   17.95    2.608  0.30( 0.29) 0.97     752.8   20100.00
     7     1586.50   22.26    2.257  0.30( 0.29) 0.96     895.9   13600.00
     8     1747.83   56.36    1.320  0.30( 0.29) 0.96    1878.9   13510.00
     9     1683.28   64.40    1.249  0.30( 0.29) 0.95    1941.7   13500.00
   TOTAL AREA(ACRES) =      1941.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     1747.83  Tc(MIN.) =   56.360
 EFFECTIVE AREA(ACRES) =   1878.86  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.96
 TOTAL AREA(ACRES) =     1941.7
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13640.00 =   22062.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13640.00 TO NODE  13641.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    489.00  DOWNSTREAM(FEET) =    436.89
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2992.90   CHANNEL SLOPE =  0.0174
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.13
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.271
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      180.31      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1826.65
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.46
 AVERAGE FLOW DEPTH(FEET) =   4.12   TRAVEL TIME(MIN.) =   4.77
 Tc(MIN.) =   61.13
 SUBAREA AREA(ACRES) =   180.31       SUBAREA RUNOFF(CFS) =  157.64
 EFFECTIVE AREA(ACRES) =   2059.17     AREA-AVERAGED Fm(INCH/HR) =   0.29
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 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.96
 TOTAL AREA(ACRES) =     2122.0         PEAK FLOW RATE(CFS) =    1822.92
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.12

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.12   FLOW VELOCITY(FEET/SEC.) =  10.45
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13641.00 =   25054.98 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     1536.24   16.16    2.788  0.30( 0.29) 0.98     684.1   20500.00
     2     1603.14   18.36    2.567  0.30( 0.29) 0.98     783.3   20400.00
     3     1602.79   18.72    2.530  0.30( 0.29) 0.98     796.1   20300.00
     4     1602.92   21.12    2.330  0.30( 0.29) 0.97     874.1   20210.00
     5     1604.77   21.21    2.324  0.30( 0.29) 0.97     877.6   20200.00
     6     1621.63   22.80    2.223  0.30( 0.29) 0.97     933.1   20100.00
     7     1644.47   27.12    1.989  0.30( 0.29) 0.97    1076.2   13600.00
     8     1822.92   61.13    1.271  0.30( 0.29) 0.96    2059.2   13510.00
     9     1774.62   69.22    1.216  0.30( 0.29) 0.96    2122.0   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    1822.92  Tc(MIN.) =   61.13
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.96  EFFECTIVE AREA(ACRES) =    2059.17

****************************************************************************
 FLOW PROCESS FROM NODE  13641.00 TO NODE  13642.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    436.89  DOWNSTREAM(FEET) =    394.80
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2814.16   CHANNEL SLOPE =  0.0150
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.54
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.240
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      451.39      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2013.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.20
 AVERAGE FLOW DEPTH(FEET) =   4.53   TRAVEL TIME(MIN.) =   4.60
 Tc(MIN.) =   65.73
 SUBAREA AREA(ACRES) =   451.39       SUBAREA RUNOFF(CFS) =  381.93
 EFFECTIVE AREA(ACRES) =   2510.56     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     2573.4         PEAK FLOW RATE(CFS) =    2146.91
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.69

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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 DEPTH(FEET) =  4.69   FLOW VELOCITY(FEET/SEC.) =  10.40
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13642.00 =   27869.14 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2099.77   20.79    2.350  0.30( 0.30) 0.99    1135.5   20500.00
     2     2129.96   22.97    2.212  0.30( 0.30) 0.98    1234.7   20400.00
     3     2125.70   23.34    2.189  0.30( 0.30) 0.98    1247.5   20300.00
     4     2093.28   25.75    2.050  0.30( 0.29) 0.98    1325.5   20210.00
     5     2094.08   25.84    2.046  0.30( 0.29) 0.98    1329.0   20200.00
     6     2093.91   27.43    1.975  0.30( 0.29) 0.98    1384.5   20100.00
     7     2093.17   31.76    1.816  0.30( 0.29) 0.98    1527.6   13600.00
     8     2146.91   65.73    1.240  0.30( 0.29) 0.97    2510.6   13510.00
     9     2073.79   73.86    1.185  0.30( 0.29) 0.96    2573.4   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    2146.91  Tc(MIN.) =   65.73
 AREA-AVERAGED Fm(INCH/HR) =  0.29  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.97  EFFECTIVE AREA(ACRES) =    2510.56

****************************************************************************
 FLOW PROCESS FROM NODE  13642.00 TO NODE  13643.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    394.80  DOWNSTREAM(FEET) =    342.39
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2913.57   CHANNEL SLOPE =  0.0180
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.66
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.211
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      434.58      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2325.08
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.36
 AVERAGE FLOW DEPTH(FEET) =   4.66   TRAVEL TIME(MIN.) =   4.28
 Tc(MIN.) =   70.00
 SUBAREA AREA(ACRES) =   434.58       SUBAREA RUNOFF(CFS) =  356.33
 EFFECTIVE AREA(ACRES) =   2945.14     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =     3008.0         PEAK FLOW RATE(CFS) =    2437.53
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.77

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.77   FLOW VELOCITY(FEET/SEC.) =  11.52
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13643.00 =   30782.71 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1     2523.51   25.01    2.083  0.30( 0.30) 0.99    1570.1   20500.00
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      2     2538.98   27.17    1.987  0.30( 0.30) 0.99    1669.3   20400.00
      3     2533.40   27.55    1.970  0.30( 0.30) 0.99    1682.1   20300.00
      4     2479.77   29.99    1.862  0.30( 0.30) 0.99    1760.0   20210.00
      5     2480.75   30.08    1.859  0.30( 0.30) 0.99    1763.6   20200.00
      6     2492.63   31.67    1.818  0.30( 0.30) 0.99    1819.1   20100.00
      7     2494.73   36.01    1.708  0.30( 0.30) 0.98    1962.2   13600.00
      8     2437.53   70.00    1.211  0.30( 0.29) 0.97    2945.1   13510.00
      9     2340.28   78.19    1.155  0.30( 0.29) 0.97    3008.0   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2538.98  Tc(MIN.) =   27.17
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1669.30

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    342.39  DOWNSTREAM(FEET) =    300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1591.23   CHANNEL SLOPE =  0.0266
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.899
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      109.24      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2617.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.51
  AVERAGE FLOW DEPTH(FEET) =   4.47   TRAVEL TIME(MIN.) =   1.96
  Tc(MIN.) =   29.14
  SUBAREA AREA(ACRES) =   109.24       SUBAREA RUNOFF(CFS) =  157.25
  EFFECTIVE AREA(ACRES) =   1778.54     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3117.3         PEAK FLOW RATE(CFS) =    2565.24
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.41   FLOW VELOCITY(FEET/SEC.) =  13.44
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2566.99   26.97    1.996  0.30( 0.30) 0.99    1679.3   20500.00
      2     2565.24   29.14    1.899  0.30( 0.30) 0.99    1778.5   20400.00
      3     2556.99   29.51    1.883  0.30( 0.30) 0.99    1791.4   20300.00
      4     2548.10   31.96    1.811  0.30( 0.30) 0.99    1869.3   20210.00
      5     2549.06   32.05    1.809  0.30( 0.30) 0.99    1872.8   20200.00
      6     2554.56   33.65    1.768  0.30( 0.30) 0.99    1928.3   20100.00
      7     2539.23   37.98    1.657  0.30( 0.30) 0.98    2071.4   13600.00
      8     2489.83   72.00    1.197  0.30( 0.29) 0.97    3054.4   13510.00
```



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      9     2385.85   80.21    1.142  0.30( 0.29) 0.97    3117.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2566.99  Tc(MIN.) =   26.97
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1679.35

****************************************************************************
  FLOW PROCESS FROM NODE  13643.00 TO NODE  13660.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610206Y.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      332.25   21.83  0.30( 0.30) 1.00     186.0   20600.00
    TOTAL AREA(ACRES) =      186.0

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13660.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2566.99   26.97    1.996  0.30( 0.30) 0.99    1679.3   20500.00
      2     2565.24   29.14    1.899  0.30( 0.30) 0.99    1778.5   20400.00
      3     2556.99   29.51    1.883  0.30( 0.30) 0.99    1791.4   20300.00
      4     2548.10   31.96    1.811  0.30( 0.30) 0.99    1869.3   20210.00
      5     2549.06   32.05    1.809  0.30( 0.30) 0.99    1872.8   20200.00
      6     2554.56   33.65    1.768  0.30( 0.30) 0.99    1928.3   20100.00
      7     2539.23   37.98    1.657  0.30( 0.30) 0.98    2071.4   13600.00
      8     2489.83   72.00    1.197  0.30( 0.29) 0.97    3054.4   13510.00
      9     2385.85   80.21    1.142  0.30( 0.29) 0.97    3117.3   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      332.25   21.83    2.285  0.30( 0.30) 1.00     186.0   20600.00
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  13660.00 =    6967.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2763.62   21.83    2.285  0.30( 0.30) 0.99    1545.2   20600.00
      2     2850.83   26.97    1.996  0.30( 0.30) 0.99    1865.4   20500.00
      3     2832.98   29.14    1.899  0.30( 0.30) 0.99    1964.6   20400.00
      4     2821.95   29.51    1.883  0.30( 0.30) 0.99    1977.4   20300.00
      5     2801.03   31.96    1.811  0.30( 0.30) 0.99    2055.3   20210.00
```

```
      6     2801.60   32.05    1.809  0.30( 0.30) 0.99    2058.8   20200.00
      7     2800.30   33.65    1.768  0.30( 0.30) 0.99    2114.3   20100.00
      8     2766.46   37.98    1.657  0.30( 0.30) 0.99    2257.5   13600.00
      9     2640.06   72.00    1.197  0.30( 0.29) 0.97    3240.4   13510.00
     10     2526.74   80.21    1.142  0.30( 0.29) 0.97    3303.3   13500.00
    TOTAL AREA(ACRES) =      3303.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2850.83  Tc(MIN.) =   26.969
  EFFECTIVE AREA(ACRES) =   1865.38  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3303.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13660.00 =   32373.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    300.00  DOWNSTREAM(FEET) =    288.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   933.89   CHANNEL SLOPE =  0.0128
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.72
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.931
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       61.43      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2895.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.74
  AVERAGE FLOW DEPTH(FEET) =   5.72   TRAVEL TIME(MIN.) =   1.45
  Tc(MIN.) =   28.42
  SUBAREA AREA(ACRES) =    61.43       SUBAREA RUNOFF(CFS) =   90.19
  EFFECTIVE AREA(ACRES) =   1926.81     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3364.7         PEAK FLOW RATE(CFS) =    2850.83
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.67   FLOW VELOCITY(FEET/SEC.) =  10.69
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2763.62   23.29    2.192  0.30( 0.30) 0.99    1606.6   20600.00
      2     2850.83   28.42    1.931  0.30( 0.30) 0.99    1926.8   20500.00
      3     2832.98   30.59    1.846  0.30( 0.30) 0.99    2026.0   20400.00
      4     2824.48   30.96    1.836  0.30( 0.30) 0.99    2038.8   20300.00
      5     2813.89   33.42    1.774  0.30( 0.30) 0.99    2116.7   20210.00
      6     2814.14   33.51    1.771  0.30( 0.30) 0.99    2120.3   20200.00
```



```
      7     2808.77   35.10    1.731  0.30( 0.30) 0.99    2175.8   20100.00
      8     2766.46   39.45    1.620  0.30( 0.30) 0.99    2318.9   13600.00
      9     2659.72   73.48    1.187  0.30( 0.29) 0.97    3301.8   13510.00
     10     2542.36   81.71    1.131  0.30( 0.29) 0.97    3364.7   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    2850.83  Tc(MIN.) =   28.42
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    1926.81

****************************************************************************
  FLOW PROCESS FROM NODE  13660.00 TO NODE  13680.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610207Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      399.35   15.84  0.30( 0.28) 0.92     174.5   20700.00
    TOTAL AREA(ACRES) =      174.5

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13680.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2763.62   23.29    2.192  0.30( 0.30) 0.99    1606.6   20600.00
      2     2850.83   28.42    1.931  0.30( 0.30) 0.99    1926.8   20500.00
      3     2832.98   30.59    1.846  0.30( 0.30) 0.99    2026.0   20400.00
      4     2824.48   30.96    1.836  0.30( 0.30) 0.99    2038.8   20300.00
      5     2813.89   33.42    1.774  0.30( 0.30) 0.99    2116.7   20210.00
      6     2814.14   33.51    1.771  0.30( 0.30) 0.99    2120.3   20200.00
      7     2808.77   35.10    1.731  0.30( 0.30) 0.99    2175.8   20100.00
      8     2766.46   39.45    1.620  0.30( 0.30) 0.99    2318.9   13600.00
      9     2659.72   73.48    1.187  0.30( 0.29) 0.97    3301.8   13510.00
     10     2542.36   81.71    1.131  0.30( 0.29) 0.97    3364.7   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      399.35   15.84    2.820  0.30( 0.28) 0.92     174.5   20700.00
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  13680.00 =    6221.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2902.69   15.84    2.820  0.30( 0.29) 0.98    1267.3   20700.00
```

```
      2     3064.29   23.29    2.192  0.30( 0.30) 0.99    1781.2   20600.00
      3     3110.57   28.42    1.931  0.30( 0.30) 0.99    2101.3   20500.00
      4     3079.34   30.59    1.846  0.30( 0.30) 0.99    2200.5   20400.00
      5     3069.33   30.96    1.836  0.30( 0.30) 0.99    2213.3   20300.00
      6     3048.91   33.42    1.774  0.30( 0.30) 0.98    2291.2   20210.00
      7     3048.79   33.51    1.771  0.30( 0.30) 0.98    2294.8   20200.00
      8     3037.05   35.10    1.731  0.30( 0.30) 0.98    2350.3   20100.00
      9     2977.35   39.45    1.620  0.30( 0.29) 0.98    2493.4   13600.00
     10     2802.65   73.48    1.187  0.30( 0.29) 0.97    3476.3   13510.00
     11     2676.51   81.71    1.131  0.30( 0.29) 0.97    3539.2   13500.00
    TOTAL AREA(ACRES) =      3539.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3110.57  Tc(MIN.) =   28.418
  EFFECTIVE AREA(ACRES) =   2101.31  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     3539.2
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13680.00 =   33307.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.00  DOWNSTREAM(FEET) =    242.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2860.77   CHANNEL SLOPE =  0.0161
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.800
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      112.53      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3186.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.97
  AVERAGE FLOW DEPTH(FEET) =   5.67   TRAVEL TIME(MIN.) =   3.98
  Tc(MIN.) =   32.40
  SUBAREA AREA(ACRES) =   112.53       SUBAREA RUNOFF(CFS) =  151.90
  EFFECTIVE AREA(ACRES) =   2213.84     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =     3651.8         PEAK FLOW RATE(CFS) =    3110.57
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.60   FLOW VELOCITY(FEET/SEC.) =  11.88
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2902.69   19.89    2.412  0.30( 0.30) 0.98    1379.8   20700.00
```



```
      2     3064.29   27.29    1.981  0.30( 0.30) 0.99    1893.7   20600.00
      3     3110.57   32.40    1.800  0.30( 0.30) 0.99    2213.8   20500.00
      4     3079.34   34.59    1.744  0.30( 0.30) 0.99    2313.0   20400.00
      5     3069.33   34.97    1.734  0.30( 0.30) 0.99    2325.8   20300.00
      6     3048.91   37.43    1.672  0.30( 0.30) 0.99    2403.8   20210.00
      7     3048.79   37.52    1.669  0.30( 0.30) 0.99    2407.3   20200.00
      8     3037.05   39.12    1.628  0.30( 0.30) 0.98    2462.8   20100.00
      9     2977.35   43.49    1.531  0.30( 0.29) 0.98    2605.9   13600.00
     10     2802.65   77.60    1.159  0.30( 0.29) 0.97    3588.9   13510.00
     11     2676.51   85.88    1.103  0.30( 0.29) 0.97    3651.8   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3110.57  Tc(MIN.) =   32.40
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2213.84

****************************************************************************
  FLOW PROCESS FROM NODE  13680.00 TO NODE  13682.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610208Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      389.71   15.42  0.30( 0.30) 0.99     168.9   20810.00
      2      381.17   18.24  0.30( 0.30) 0.99     185.8   20800.00
    TOTAL AREA(ACRES) =      185.8

****************************************************************************
  FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     2902.69   19.89    2.412  0.30( 0.30) 0.98    1379.8   20700.00
      2     3064.29   27.29    1.981  0.30( 0.30) 0.99    1893.7   20600.00
      3     3110.57   32.40    1.800  0.30( 0.30) 0.99    2213.8   20500.00
      4     3079.34   34.59    1.744  0.30( 0.30) 0.99    2313.0   20400.00
      5     3069.33   34.97    1.734  0.30( 0.30) 0.99    2325.8   20300.00
      6     3048.91   37.43    1.672  0.30( 0.30) 0.99    2403.8   20210.00
      7     3048.79   37.52    1.669  0.30( 0.30) 0.99    2407.3   20200.00
      8     3037.05   39.12    1.628  0.30( 0.30) 0.98    2462.8   20100.00
      9     2977.35   43.49    1.531  0.30( 0.29) 0.98    2605.9   13600.00
     10     2802.65   77.60    1.159  0.30( 0.29) 0.97    3588.9   13510.00
     11     2676.51   85.88    1.103  0.30( 0.29) 0.97    3651.8   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      389.71   15.42    2.863  0.30( 0.30) 0.99     168.9   20810.00
    2      381.17   18.24    2.578  0.30( 0.30) 0.99     185.8   20800.00
LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  13682.00 =    5285.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3119.12   15.42    2.863  0.30( 0.30) 0.99    1238.7   20810.00
    2     3252.28   18.24    2.578  0.30( 0.30) 0.99    1451.4   20800.00
    3     3256.11   19.89    2.412  0.30( 0.30) 0.99    1565.6   20700.00
    4     3345.68   27.29    1.981  0.30( 0.30) 0.99    2079.5   20600.00
    5     3361.59   32.40    1.800  0.30( 0.30) 0.99    2399.7   20500.00
    6     3321.05   34.59    1.744  0.30( 0.30) 0.99    2498.8   20400.00
    7     3309.41   34.97    1.734  0.30( 0.30) 0.99    2511.7   20300.00
    8     3278.50   37.43    1.672  0.30( 0.30) 0.99    2589.6   20210.00
    9     3277.98   37.52    1.669  0.30( 0.30) 0.99    2593.1   20200.00
   10     3259.43   39.12    1.628  0.30( 0.30) 0.99    2648.6   20100.00
   11     3183.50   43.49    1.531  0.30( 0.30) 0.98    2791.7   13600.00
   12     2946.59   77.60    1.159  0.30( 0.29) 0.97    3774.7   13510.00
   13     2811.03   85.88    1.103  0.30( 0.29) 0.97    3837.6   13500.00
  TOTAL AREA(ACRES) =      3837.6

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     3361.59  Tc(MIN.) =   32.402
 EFFECTIVE AREA(ACRES) =   2399.66  AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
 TOTAL AREA(ACRES) =     3837.6
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.00 =   36168.60 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13682.00 TO NODE  13682.50 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    242.00  DOWNSTREAM(FEET) =    230.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   660.20   CHANNEL SLOPE =  0.0182
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.64
 CHANNEL FLOW THRU SUBAREA(CFS) =    3361.59
 FLOW VELOCITY(FEET/SEC.) =  12.69   FLOW DEPTH(FEET) =   5.64
 TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   33.27
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3119.12   16.31    2.773  0.30( 0.30) 0.99    1238.7   20810.00
    2     3252.28   19.12    2.490  0.30( 0.30) 0.99    1451.4   20800.00
    3     3256.11   20.76    2.352  0.30( 0.30) 0.99    1565.6   20700.00
    4     3345.68   28.16    1.943  0.30( 0.30) 0.99    2079.5   20600.00
    5     3361.59   33.27    1.778  0.30( 0.30) 0.99    2399.7   20500.00
    6     3321.05   35.46    1.722  0.30( 0.30) 0.99    2498.8   20400.00
    7     3309.41   35.84    1.712  0.30( 0.30) 0.99    2511.7   20300.00
    8     3278.50   38.30    1.649  0.30( 0.30) 0.99    2589.6   20210.00
    9     3277.98   38.40    1.647  0.30( 0.30) 0.99    2593.1   20200.00
```



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   10     3259.43   39.99    1.606  0.30( 0.30) 0.99    2648.6   20100.00
   11     3183.50   44.37    1.513  0.30( 0.30) 0.98    2791.7   13600.00
   12     2946.59   78.50    1.153  0.30( 0.29) 0.97    3774.7   13510.00
   13     2811.03   86.80    1.097  0.30( 0.29) 0.97    3837.6   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    3361.59  Tc(MIN.) =   33.27
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2399.66

****************************************************************************
 FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 0610209Y.DNA
 MEMORY BANK #  3 DEFINED AS FOLLOWS:
 STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
    1      168.64   16.62  0.30( 0.30) 1.00      76.8   20900.00
  TOTAL AREA(ACRES) =       76.8

****************************************************************************
 FLOW PROCESS FROM NODE  13682.50 TO NODE  13682.50 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1     3119.12   16.31    2.773  0.30( 0.30) 0.99    1238.7   20810.00
    2     3252.28   19.12    2.490  0.30( 0.30) 0.99    1451.4   20800.00
    3     3256.11   20.76    2.352  0.30( 0.30) 0.99    1565.6   20700.00
    4     3345.68   28.16    1.943  0.30( 0.30) 0.99    2079.5   20600.00
    5     3361.59   33.27    1.778  0.30( 0.30) 0.99    2399.7   20500.00
    6     3321.05   35.46    1.722  0.30( 0.30) 0.99    2498.8   20400.00
    7     3309.41   35.84    1.712  0.30( 0.30) 0.99    2511.7   20300.00
    8     3278.50   38.30    1.649  0.30( 0.30) 0.99    2589.6   20210.00
    9     3277.98   38.40    1.647  0.30( 0.30) 0.99    2593.1   20200.00
   10     3259.43   39.99    1.606  0.30( 0.30) 0.99    2648.6   20100.00
   11     3183.50   44.37    1.513  0.30( 0.30) 0.98    2791.7   13600.00
   12     2946.59   78.50    1.153  0.30( 0.29) 0.97    3774.7   13510.00
   13     2811.03   86.80    1.097  0.30( 0.29) 0.97    3837.6   13500.00
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13682.50 =   36828.80 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      168.64   16.62    2.742  0.30( 0.30) 1.00      76.8   20900.00
 LONGEST FLOWPATH FROM NODE  20900.00 TO NODE  13682.50 =    4089.00 FEET.

 ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3286.72	16.31	2.773	0.30(0.30)	0.99	1314.1	20810.00
2	3302.54	16.62	2.742	0.30(0.30)	0.99	1339.1	20900.00
3	3403.52	19.12	2.490	0.30(0.30)	0.99	1528.1	20800.00
4	3397.85	20.76	2.352	0.30(0.30)	0.99	1642.4	20700.00
5	3459.14	28.16	1.943	0.30(0.30)	0.99	2156.3	20600.00
6	3463.64	33.27	1.778	0.30(0.30)	0.99	2476.4	20500.00
7	3419.25	35.46	1.722	0.30(0.30)	0.99	2575.6	20400.00
8	3406.94	35.84	1.712	0.30(0.30)	0.99	2588.4	20300.00
9	3371.69	38.30	1.649	0.30(0.30)	0.99	2666.3	20210.00
10	3371.00	38.40	1.647	0.30(0.30)	0.99	2669.9	20200.00
11	3349.64	39.99	1.606	0.30(0.30)	0.99	2725.4	20100.00
12	3267.25	44.37	1.513	0.30(0.30)	0.98	2868.5	13600.00
13	3005.52	78.50	1.153	0.30(0.29)	0.97	3851.4	13510.00
14	2866.06	86.80	1.097	0.30(0.29)	0.97	3914.3	13500.00

TOTAL AREA(ACRES) = 3914.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3463.64 Tc(MIN.) = 33.269
EFFECTIVE AREA(ACRES) = 2476.41 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3914.3
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

****
FLOW PROCESS FROM NODE 13682.50 TO NODE 13683.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 230.00 DOWNSTREAM(FEET) = 208.53
CHANNEL LENGTH THRU SUBAREA(FEET) = 1866.20 CHANNEL SLOPE = 0.0115
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.50
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.705
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.32	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3503.04
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.90
AVERAGE FLOW DEPTH(FEET) = 6.50 TRAVEL TIME(MIN.) = 2.85
Tc(MIN.) = 36.12
SUBAREA AREA(ACRES) = 62.32 SUBAREA RUNOFF(CFS) = 78.80
EFFECTIVE AREA(ACRES) = 2538.73 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3976.6 PEAK FLOW RATE(CFS) = 3463.64
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.46 FLOW VELOCITY(FEET/SEC.) = 10.86

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13683.00 = 38695.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3286.72	19.20	2.482	0.30(0.30)	0.99	1376.4	20810.00
2	3302.54	19.51	2.451	0.30(0.30)	0.99	1401.4	20900.00
3	3403.52	21.98	2.275	0.30(0.30)	0.99	1590.5	20800.00
4	3397.85	23.63	2.170	0.30(0.30)	0.99	1704.7	20700.00
5	3459.14	31.01	1.835	0.30(0.30)	0.99	2218.6	20600.00
6	3463.64	36.12	1.705	0.30(0.30)	0.99	2538.7	20500.00
7	3419.25	38.32	1.649	0.30(0.30)	0.99	2637.9	20400.00
8	3406.94	38.71	1.639	0.30(0.30)	0.99	2650.7	20300.00
9	3371.69	41.18	1.581	0.30(0.30)	0.99	2728.7	20210.00
10	3371.00	41.27	1.579	0.30(0.30)	0.99	2732.2	20200.00
11	3349.64	42.87	1.544	0.30(0.30)	0.99	2787.7	20100.00
12	3267.25	47.27	1.450	0.30(0.30)	0.98	2930.8	13600.00
13	3005.52	81.48	1.133	0.30(0.29)	0.97	3913.8	13510.00
14	2866.06	89.81	1.076	0.30(0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 3463.64 Tc(MIN.) = 36.12
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2538.73

****
FLOW PROCESS FROM NODE 13683.00 TO NODE 13684.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 208.53 DOWNSTREAM(FEET) = 200.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 166.32 CHANNEL SLOPE = 0.0513
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.35
CHANNEL FLOW THRU SUBAREA(CFS) = 3463.64
FLOW VELOCITY(FEET/SEC.) = 18.49 FLOW DEPTH(FEET) = 4.35
TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 36.27
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3286.72	19.35	2.467	0.30(0.30)	0.99	1376.4	20810.00
2	3302.54	19.66	2.435	0.30(0.30)	0.99	1401.4	20900.00
3	3403.52	22.13	2.265	0.30(0.30)	0.99	1590.5	20800.00
4	3397.85	23.78	2.161	0.30(0.30)	0.99	1704.7	20700.00
5	3459.14	31.16	1.831	0.30(0.30)	0.99	2218.6	20600.00
6	3463.64	36.27	1.701	0.30(0.30)	0.99	2538.7	20500.00
7	3419.25	38.47	1.645	0.30(0.30)	0.99	2637.9	20400.00
8	3406.94	38.86	1.635	0.30(0.30)	0.99	2650.7	20300.00
9	3371.69	41.33	1.578	0.30(0.30)	0.99	2728.7	20210.00
10	3371.00	41.42	1.576	0.30(0.30)	0.99	2732.2	20200.00
11	3349.64	43.03	1.541	0.30(0.30)	0.99	2787.7	20100.00
12	3267.25	47.42	1.447	0.30(0.30)	0.98	2930.8	13600.00
13	3005.52	81.63	1.132	0.30(0.29)	0.97	3913.8	13510.00
14	2866.06	89.97	1.075	0.30(0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:

```
  PEAK FLOW RATE(CFS) =    3463.64  Tc(MIN.) =   36.27
  AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2538.73

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0610210Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      180.67   16.76  0.30( 0.30) 1.00      82.7   21000.00
    TOTAL AREA(ACRES) =       82.7

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13684.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3286.72   19.35    2.467  0.30( 0.30) 0.99    1376.4   20810.00
      2     3302.54   19.66    2.435  0.30( 0.30) 0.99    1401.4   20900.00
      3     3403.52   22.13    2.265  0.30( 0.30) 0.99    1590.5   20800.00
      4     3397.85   23.78    2.161  0.30( 0.30) 0.99    1704.7   20700.00
      5     3459.14   31.16    1.831  0.30( 0.30) 0.99    2218.6   20600.00
      6     3463.64   36.27    1.701  0.30( 0.30) 0.99    2538.7   20500.00
      7     3419.25   38.47    1.645  0.30( 0.30) 0.99    2637.9   20400.00
      8     3406.94   38.86    1.635  0.30( 0.30) 0.99    2650.7   20300.00
      9     3371.69   41.33    1.578  0.30( 0.30) 0.99    2728.7   20210.00
     10     3371.00   41.42    1.576  0.30( 0.30) 0.99    2732.2   20200.00
     11     3349.64   43.03    1.541  0.30( 0.30) 0.99    2787.7   20100.00
     12     3267.25   47.42    1.447  0.30( 0.30) 0.98    2930.8   13600.00
     13     3005.52   81.63    1.132  0.30( 0.29) 0.97    3913.8   13510.00
     14     2866.06   89.97    1.075  0.30( 0.29) 0.97    3976.6   13500.00
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      180.67   16.76    2.728  0.30( 0.30) 1.00      82.7   21000.00
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  13684.00 =    4160.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3369.82   16.76    2.728  0.30( 0.30) 0.99    1274.8   21000.00
      2     3447.96   19.35    2.467  0.30( 0.30) 0.99    1459.1   20810.00
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      3     3461.47   19.66    2.435  0.30( 0.30) 0.99    1484.1   20900.00
      4     3549.79   22.13    2.265  0.30( 0.30) 0.99    1673.2   20800.00
      5     3536.32   23.78    2.161  0.30( 0.30) 0.99    1787.4   20700.00
      6     3573.11   31.16    1.831  0.30( 0.30) 0.99    2301.3   20600.00
      7     3567.91   36.27    1.701  0.30( 0.30) 0.99    2621.4   20500.00
      8     3519.35   38.47    1.645  0.30( 0.30) 0.99    2720.6   20400.00
      9     3506.31   38.86    1.635  0.30( 0.30) 0.99    2733.4   20300.00
     10     3466.76   41.33    1.578  0.30( 0.30) 0.99    2811.4   20210.00
     11     3465.93   41.42    1.576  0.30( 0.30) 0.99    2814.9   20200.00
     12     3442.02   43.03    1.541  0.30( 0.30) 0.99    2870.4   20100.00
     13     3352.63   47.42    1.447  0.30( 0.30) 0.98    3013.5   13600.00
     14     3067.43   81.63    1.132  0.30( 0.29) 0.98    3996.5   13510.00
     15     2923.76   89.97    1.075  0.30( 0.29) 0.97    4059.3   13500.00
    TOTAL AREA(ACRES) =      4059.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3573.11  Tc(MIN.) =   31.161
  EFFECTIVE AREA(ACRES) =   2301.28  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =     4059.3
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13684.00 =   38861.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13684.00 TO NODE  13685.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    200.00  DOWNSTREAM(FEET) =    194.24
  CHANNEL LENGTH THRU SUBAREA(FEET) =   122.69   CHANNEL SLOPE =  0.0469
  GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.53
  CHANNEL FLOW THRU SUBAREA(CFS) =    3573.11
  FLOW VELOCITY(FEET/SEC.) =  18.10   FLOW DEPTH(FEET) =   4.53
  TRAVEL TIME(MIN.) =   0.11   Tc(MIN.) =   31.27
  LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13685.00 =   38984.01 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3369.82   16.87    2.716  0.30( 0.30) 0.99    1274.8   21000.00
      2     3447.96   19.46    2.455  0.30( 0.30) 0.99    1459.1   20810.00
      3     3461.47   19.77    2.424  0.30( 0.30) 0.99    1484.1   20900.00
      4     3549.79   22.25    2.258  0.30( 0.30) 0.99    1673.2   20800.00
      5     3536.32   23.89    2.153  0.30( 0.30) 0.99    1787.4   20700.00
      6     3573.11   31.27    1.829  0.30( 0.30) 0.99    2301.3   20600.00
      7     3567.91   36.39    1.698  0.30( 0.30) 0.99    2621.4   20500.00
      8     3519.35   38.58    1.642  0.30( 0.30) 0.99    2720.6   20400.00
      9     3506.31   38.97    1.632  0.30( 0.30) 0.99    2733.4   20300.00
     10     3466.76   41.44    1.575  0.30( 0.30) 0.99    2811.4   20210.00
     11     3465.93   41.54    1.573  0.30( 0.30) 0.99    2814.9   20200.00
     12     3442.02   43.14    1.539  0.30( 0.30) 0.99    2870.4   20100.00
     13     3352.63   47.54    1.445  0.30( 0.30) 0.98    3013.5   13600.00
     14     3067.43   81.75    1.131  0.30( 0.29) 0.98    3996.5   13510.00
     15     2923.76   90.09    1.075  0.30( 0.29) 0.97    4059.3   13500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =    3573.11  Tc(MIN.) =   31.27
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 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2301.28

****************************************************************************
 FLOW PROCESS FROM NODE  13685.00 TO NODE  13410.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    194.24  DOWNSTREAM(FEET) =    178.72
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1843.57   CHANNEL SLOPE =  0.0084
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.749
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        8.39      0.30     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3578.58
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.80
 AVERAGE FLOW DEPTH(FEET) =   7.12   TRAVEL TIME(MIN.) =   3.14
 Tc(MIN.) =   34.41
 SUBAREA AREA(ACRES) =     8.39       SUBAREA RUNOFF(CFS) =   10.94
 EFFECTIVE AREA(ACRES) =   2309.67     AREA-AVERAGED Fm(INCH/HR) =   0.30
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
 TOTAL AREA(ACRES) =     4067.7         PEAK FLOW RATE(CFS) =    3573.11
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =   30.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   7.11

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  7.11   FLOW VELOCITY(FEET/SEC.) =   9.79
 LONGEST FLOWPATH FROM NODE  13500.00 TO NODE  13410.00 =   40827.58 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3369.82   20.06    2.397  0.30( 0.30) 0.99    1283.2   21000.00
     2     3447.96   22.63    2.234  0.30( 0.30) 0.99    1467.5   20810.00
     3     3461.47   22.94    2.214  0.30( 0.30) 0.99    1492.5   20900.00
     4     3549.79   25.39    2.066  0.30( 0.30) 0.99    1681.6   20800.00
     5     3536.32   27.04    1.992  0.30( 0.30) 0.99    1795.8   20700.00
     6     3573.11   34.41    1.749  0.30( 0.30) 0.99    2309.7   20600.00
     7     3567.91   39.52    1.618  0.30( 0.30) 0.99    2629.8   20500.00
     8     3519.35   41.73    1.569  0.30( 0.30) 0.99    2729.0   20400.00
     9     3506.31   42.12    1.561  0.30( 0.30) 0.99    2741.8   20300.00
    10     3466.76   44.61    1.507  0.30( 0.30) 0.99    2819.8   20210.00
    11     3465.93   44.70    1.505  0.30( 0.30) 0.99    2823.3   20200.00
    12     3442.02   46.31    1.471  0.30( 0.30) 0.99    2878.8   20100.00
    13     3352.63   50.73    1.384  0.30( 0.30) 0.98    3021.9   13600.00
    14     3067.43   85.03    1.109  0.30( 0.29) 0.98    4004.9   13510.00
    15     2923.76   93.41    1.059  0.30( 0.29) 0.97    4067.7   13500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =    3573.11  Tc(MIN.) =   34.41
```



```
 AREA-AVERAGED Fm(INCH/HR) =  0.30  AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.99  EFFECTIVE AREA(ACRES) =    2309.67
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     4067.7  TC(MIN.) =     34.41
 EFFECTIVE AREA(ACRES) =   2309.67  AREA-AVERAGED Fm(INCH/HR)=  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.988
 PEAK FLOW RATE(CFS)   =    3573.11

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     3369.82   20.06    2.397  0.30( 0.30) 0.99    1283.2   21000.00
     2     3447.96   22.63    2.234  0.30( 0.30) 0.99    1467.5   20810.00
     3     3461.47   22.94    2.214  0.30( 0.30) 0.99    1492.5   20900.00
     4     3549.79   25.39    2.066  0.30( 0.30) 0.99    1681.6   20800.00
     5     3536.32   27.04    1.992  0.30( 0.30) 0.99    1795.8   20700.00
     6     3573.11   34.41    1.749  0.30( 0.30) 0.99    2309.7   20600.00
     7     3567.91   39.52    1.618  0.30( 0.30) 0.99    2629.8   20500.00
     8     3519.35   41.73    1.569  0.30( 0.30) 0.99    2729.0   20400.00
     9     3506.31   42.12    1.561  0.30( 0.30) 0.99    2741.8   20300.00
    10     3466.76   44.61    1.507  0.30( 0.30) 0.99    2819.8   20210.00
    11     3465.93   44.70    1.505  0.30( 0.30) 0.99    2823.3   20200.00
    12     3442.02   46.31    1.471  0.30( 0.30) 0.99    2878.8   20100.00
    13     3352.63   50.73    1.384  0.30( 0.30) 0.98    3021.9   13600.00
    14     3067.43   85.03    1.109  0.30( 0.29) 0.98    4004.9   13510.00
    15     2923.76   93.41    1.059  0.30( 0.29) 0.97    4067.7   13500.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S37.DAT
  TIME/DATE OF STUDY: 11:06 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.768
   2)   10.00;  3.736
   3)   15.00;  2.899
   4)   20.00;  2.397
   5)   25.00;  2.080
   6)   30.00;  1.859
   7)   40.00;  1.604
   8)   50.00;  1.391
   9)   60.00;  1.276
  10)   90.00;  1.073
  11)  120.00;  0.936
  12)  180.00;  0.780
  13)  360.00;  0.574
  14) 1440.00;  0.249
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S34.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    31673.70   17.52  0.30( 0.29) 0.98    5058.9   21100.00
      2    35586.87   27.40  0.30( 0.29) 0.98    8677.2   20700.00
      3    38737.79   35.82  0.30( 0.29) 0.98   12175.2   10100.00
      4    42744.09   46.65  0.30( 0.29) 0.97   17823.7   20100.00
      5    44436.62   54.51  0.30( 0.29) 0.97   22152.7   31400.00
      6    46235.82   64.15  0.30( 0.29) 0.97   27358.8   13100.00
      7    47816.95   70.67  0.30( 0.29) 0.97   30463.5   11801.00
      8    50030.41   79.97  0.30( 0.29) 0.97   35505.3   11530.00
      9    51187.35   85.35  0.30( 0.29) 0.97   39153.8   13510.00
     10    52239.65   90.45  0.30( 0.29) 0.97   42505.1   13010.00
     11    53308.27   95.34  0.30( 0.29) 0.97   45753.6   11330.00
     12    53919.91  101.63  0.30( 0.29) 0.97   50183.9   11130.00
     13    53295.84  109.23  0.30( 0.29) 0.98   54174.1   12330.00
     14    52611.52  115.91  0.30( 0.29) 0.98   57517.2   12400.00
     15    51555.09  124.63  0.30( 0.29) 0.98   60884.6   12201.00
     16    50036.79  134.05  0.30( 0.29) 0.98   63340.2   12101.10
     17    49355.52  138.11  0.30( 0.29) 0.98   64190.9   10400.00
     18    47520.54  146.23  0.30( 0.29) 0.98   65503.1   12010.00
     19    45995.87  152.23  0.30( 0.29) 0.98   65819.6   10210.00
     20    41590.08  178.60  0.30( 0.29) 0.98   66551.6   10100.00
   TOTAL AREA(ACRES) =    66551.6

**************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13700.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)     NODE
      1    31673.70   17.52  0.30( 0.29) 0.98    5058.9   21100.00
      2    35586.87   27.40  0.30( 0.29) 0.98    8677.2   20700.00
      3    38737.79   35.82  0.30( 0.29) 0.98   12175.2   10100.00
      4    42744.09   46.65  0.30( 0.29) 0.97   17823.7   20100.00
      5    44436.62   54.51  0.30( 0.29) 0.97   22152.7   31400.00
      6    46235.82   64.15  0.30( 0.29) 0.97   27358.8   13100.00
      7    47816.95   70.67  0.30( 0.29) 0.97   30463.5   11801.00
      8    50030.41   79.97  0.30( 0.29) 0.97   35505.3   11530.00
      9    51187.35   85.35  0.30( 0.29) 0.97   39153.8   13510.00
     10    52239.65   90.45  0.30( 0.29) 0.97   42505.1   13010.00
     11    53308.27   95.34  0.30( 0.29) 0.97   45753.6   11330.00
     12    53919.91  101.63  0.30( 0.29) 0.97   50183.9   11130.00
     13    53295.84  109.23  0.30( 0.29) 0.98   54174.1   12330.00
     14    52611.52  115.91  0.30( 0.29) 0.98   57517.2   12400.00
     15    51555.09  124.63  0.30( 0.29) 0.98   60884.6   12201.00
     16    50036.79  134.05  0.30( 0.29) 0.98   63340.2   12101.10
     17    49355.52  138.11  0.30( 0.29) 0.98   64190.9   10400.00
     18    47520.54  146.23  0.30( 0.29) 0.98   65503.1   12010.00
```

```
     19    45995.87  152.23  0.30( 0.29) 0.98   65819.6   10210.00
     20    41590.08  178.60  0.30( 0.29) 0.98   66551.6   10100.00
    TOTAL AREA(ACRES) =     66551.6

****************************************************************************
  FLOW PROCESS FROM NODE  13700.00 TO NODE  13701.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    167.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1699.11   CHANNEL SLOPE =  0.0015
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  17.54
  CHANNEL FLOW THRU SUBAREA(CFS) =   53919.91
  FLOW VELOCITY(FEET/SEC.) =  10.68   FLOW DEPTH(FEET) =  17.54
  TRAVEL TIME(MIN.) =   2.65   Tc(MIN.) =  104.28
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509102Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      294.69   22.88  0.30( 0.26) 0.87     167.7   10200.00
    TOTAL AREA(ACRES) =      167.7

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13701.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    31673.70   20.64    2.356  0.30( 0.29) 0.98    5058.9   21100.00
      2    35586.87   30.41    1.848  0.30( 0.29) 0.98    8677.2   20700.00
      3    38737.79   38.75    1.636  0.30( 0.29) 0.98   12175.2   10100.00
      4    42744.09   49.50    1.402  0.30( 0.29) 0.97   17823.7   20100.00
      5    44436.62   57.32    1.307  0.30( 0.29) 0.97   22152.7   31400.00
      6    46235.82   66.93    1.229  0.30( 0.29) 0.97   27358.8   13100.00
      7    47816.95   73.42    1.185  0.30( 0.29) 0.97   30463.5   11801.00
      8    50030.41   82.68    1.123  0.30( 0.29) 0.97   35505.3   11530.00
      9    51187.35   88.04    1.086  0.30( 0.29) 0.97   39153.8   13510.00
     10    52239.65   93.13    1.059  0.30( 0.29) 0.97   42505.1   13010.00
     11    53308.27   98.00    1.036  0.30( 0.29) 0.97   45753.6   11330.00
```



```
     12    53919.91  104.28    1.008  0.30( 0.29) 0.97   50183.9   11130.00
     13    53295.84  111.90    0.973  0.30( 0.29) 0.98   54174.1   12330.00
     14    52611.52  118.58    0.942  0.30( 0.29) 0.98   57517.2   12400.00
     15    51555.09  127.32    0.917  0.30( 0.29) 0.98   60884.6   12201.00
     16    50036.79  136.76    0.892  0.30( 0.29) 0.98   63340.2   12101.10
     17    49355.52  140.84    0.882  0.30( 0.29) 0.98   64190.9   10400.00
     18    47520.54  148.98    0.861  0.30( 0.29) 0.98   65503.1   12010.00
     19    45995.87  155.01    0.845  0.30( 0.29) 0.98   65819.6   10210.00
     20    41590.08  181.47    0.778  0.30( 0.29) 0.98   66551.6   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      294.69   22.88    2.214  0.30( 0.26) 0.87     167.7   10200.00
  LONGEST FLOWPATH FROM NODE  10200.00 TO NODE  13701.00 =    9099.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    31958.86   20.64    2.356  0.30( 0.29) 0.98    5210.1   21100.00
      2    32866.35   22.88    2.214  0.30( 0.29) 0.98    6056.9   10200.00
      3    35826.36   30.41    1.848  0.30( 0.29) 0.98    8844.9   20700.00
      4    38945.21   38.75    1.636  0.30( 0.29) 0.98   12342.9   10100.00
      5    42916.16   49.50    1.402  0.30( 0.29) 0.97   17991.4   20100.00
      6    44594.36   57.32    1.307  0.30( 0.29) 0.97   22320.4   31400.00
      7    46381.84   66.93    1.229  0.30( 0.29) 0.97   27526.4   13100.00
      8    47956.34   73.42    1.185  0.30( 0.29) 0.97   30631.1   11801.00
      9    50160.34   82.68    1.123  0.30( 0.29) 0.97   35672.9   11530.00
     10    51311.81   88.04    1.086  0.30( 0.29) 0.97   39321.5   13510.00
     11    52359.96   93.13    1.059  0.30( 0.29) 0.97   42672.7   13010.00
     12    53425.22   98.00    1.036  0.30( 0.29) 0.97   45921.2   11330.00
     13    54032.53  104.28    1.008  0.30( 0.29) 0.97   50351.6   11130.00
     14    53403.21  111.90    0.973  0.30( 0.29) 0.98   54341.8   12330.00
     15    52714.29  118.58    0.942  0.30( 0.29) 0.98   57684.9   12400.00
     16    51654.00  127.32    0.917  0.30( 0.29) 0.98   61052.2   12201.00
     17    50132.00  136.76    0.892  0.30( 0.29) 0.98   63507.9   12101.10
     18    49449.12  140.84    0.882  0.30( 0.29) 0.98   64358.6   10400.00
     19    47610.95  148.98    0.861  0.30( 0.29) 0.98   65670.7   12010.00
     20    46083.92  155.01    0.845  0.30( 0.29) 0.98   65987.3   10210.00
     21    41668.07  181.47    0.778  0.30( 0.29) 0.98   66719.3   10100.00
    TOTAL AREA(ACRES) =     66719.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    54032.53  Tc(MIN.) =  104.277
  EFFECTIVE AREA(ACRES) =  50351.59  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    66719.3
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13701.00 =  126251.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13701.00 TO NODE  13720.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    165.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   192.72   CHANNEL SLOPE =  0.0103
```

```
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  10.27
  CHANNEL FLOW THRU SUBAREA(CFS) =   54032.53
  FLOW VELOCITY(FEET/SEC.) =  20.92   FLOW DEPTH(FEET) =  10.27
  TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =  104.43
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13720.00 =  126443.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.51  DOWNSTREAM(FEET) =    161.63
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2042.40   CHANNEL SLOPE =  0.0019
  GIVEN CHANNEL BASE(FEET) =  200.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   5.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  16.40
  CHANNEL FLOW THRU SUBAREA(CFS) =   54032.53
  FLOW VELOCITY(FEET/SEC.) =  11.68   FLOW DEPTH(FEET) =  16.40
  TRAVEL TIME(MIN.) =   2.91   Tc(MIN.) =  107.34
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13720.00 TO NODE  13740.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509103Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      861.38   21.52  0.30( 0.28) 0.95     474.8   10300.00
    TOTAL AREA(ACRES) =      474.8

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13740.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    31958.86   24.25    2.128  0.30( 0.29) 0.98    5210.1   21100.00
      2    32866.35   26.46    2.016  0.30( 0.29) 0.98    6056.9   10200.00
      3    35826.36   33.89    1.760  0.30( 0.29) 0.98    8844.9   20700.00
      4    38945.21   42.14    1.558  0.30( 0.29) 0.98   12342.9   10100.00
      5    42916.16   52.79    1.359  0.30( 0.29) 0.97   17991.4   20100.00
      6    44594.36   60.57    1.272  0.30( 0.29) 0.97   22320.4   31400.00
      7    46381.84   70.14    1.207  0.30( 0.29) 0.97   27526.4   13100.00
```



```
      8    47956.34   76.60    1.164  0.30( 0.29) 0.97   30631.1   11801.00
      9    50160.34   85.82    1.101  0.30( 0.29) 0.97   35672.9   11530.00
     10    51311.81   91.16    1.068  0.30( 0.29) 0.97   39321.5   13510.00
     11    52359.96   96.22    1.045  0.30( 0.29) 0.97   42672.7   13010.00
     12    53425.22  101.08    1.022  0.30( 0.29) 0.97   45921.2   11330.00
     13    54032.53  107.34    0.994  0.30( 0.29) 0.97   50351.6   11130.00
     14    53403.21  114.97    0.959  0.30( 0.29) 0.98   54341.8   12330.00
     15    52714.29  121.67    0.932  0.30( 0.29) 0.98   57684.9   12400.00
     16    51654.00  130.43    0.909  0.30( 0.29) 0.98   61052.2   12201.00
     17    50132.00  139.90    0.884  0.30( 0.29) 0.98   63507.9   12101.10
     18    49449.12  143.99    0.874  0.30( 0.29) 0.98   64358.6   10400.00
     19    47610.95  152.17    0.852  0.30( 0.29) 0.98   65670.7   12010.00
     20    46083.92  158.23    0.837  0.30( 0.29) 0.98   65987.3   10210.00
     21    41668.07  184.79    0.775  0.30( 0.29) 0.98   66719.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      861.38   21.52    2.301  0.30( 0.28) 0.95     474.8   10300.00
  LONGEST FLOWPATH FROM NODE  10300.00 TO NODE  13740.00 =    8072.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    31899.56   21.52    2.301  0.30( 0.29) 0.97    5099.3   10300.00
      2    32746.42   24.25    2.128  0.30( 0.29) 0.97    5684.9   21100.00
      3    33605.96   26.46    2.016  0.30( 0.29) 0.97    6531.6   10200.00
      4    36456.66   33.89    1.760  0.30( 0.29) 0.98    9319.7   20700.00
      5    39489.51   42.14    1.558  0.30( 0.29) 0.98   12817.7   10100.00
      6    43375.20   52.79    1.359  0.30( 0.29) 0.97   18466.1   20100.00
      7    45016.29   60.57    1.272  0.30( 0.29) 0.97   22795.2   31400.00
      8    46776.11   70.14    1.207  0.30( 0.29) 0.97   28001.2   13100.00
      9    48331.92   76.60    1.164  0.30( 0.29) 0.97   31105.9   11801.00
     10    50509.27   85.82    1.101  0.30( 0.29) 0.97   36147.7   11530.00
     11    51646.39   91.16    1.068  0.30( 0.29) 0.97   39796.3   13510.00
     12    52684.66   96.22    1.045  0.30( 0.29) 0.97   43147.5   13010.00
     13    53740.43  101.08    1.022  0.30( 0.29) 0.97   46396.0   11330.00
     14    54335.53  107.34    0.994  0.30( 0.29) 0.97   50826.3   11130.00
     15    53691.32  114.97    0.959  0.30( 0.29) 0.97   54816.6   12330.00
     16    52990.73  121.67    0.932  0.30( 0.29) 0.98   58159.6   12400.00
     17    51920.71  130.43    0.909  0.30( 0.29) 0.98   61527.0   12201.00
     18    50388.20  139.90    0.884  0.30( 0.29) 0.98   63982.6   12101.10
     19    49700.78  143.99    0.874  0.30( 0.29) 0.98   64833.4   10400.00
     20    47853.51  152.17    0.852  0.30( 0.29) 0.98   66145.5   12010.00
     21    46319.75  158.23    0.837  0.30( 0.29) 0.98   66462.0   10210.00
     22    41877.37  184.79    0.775  0.30( 0.29) 0.98   67194.1   10100.00
    TOTAL AREA(ACRES) =     67194.1

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    54335.53  Tc(MIN.) =  107.343
  EFFECTIVE AREA(ACRES) =  50826.34  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67194.1
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13740.00 =  128486.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13740.00 TO NODE  13741.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    161.63  DOWNSTREAM(FEET) =    141.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   389.20   CHANNEL SLOPE =  0.0530
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =   9.30
  CHANNEL FLOW THRU SUBAREA(CFS) =   54335.53
  FLOW VELOCITY(FEET/SEC.) =  42.60   FLOW DEPTH(FEET) =   9.30
  TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =  107.50
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13741.00 =  128875.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13741.00 TO NODE  13802.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    141.00  DOWNSTREAM(FEET) =    135.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1533.41   CHANNEL SLOPE =  0.0039
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  18.48
  CHANNEL FLOW THRU SUBAREA(CFS) =   54335.53
  FLOW VELOCITY(FEET/SEC.) =  16.90   FLOW DEPTH(FEET) =  18.48
  TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =  109.01
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
================================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
================================================================================
  PEAK FLOWRATE TABLE FILE NAME: 0509104Y.DNA
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      854.15   29.90  0.30( 0.28) 0.94     599.8   10400.00
    TOTAL AREA(ACRES) =      599.8

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13802.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    31899.56   23.46    2.178  0.30( 0.29) 0.97    5099.3   10300.00
```



```
      2    32746.42   26.17    2.028  0.30( 0.29) 0.97    5684.9   21100.00
      3    33605.96   28.37    1.931  0.30( 0.29) 0.97    6531.6   10200.00
      4    36456.66   35.76    1.712  0.30( 0.29) 0.98    9319.7   20700.00
      5    39489.51   43.96    1.520  0.30( 0.29) 0.98   12817.7   10100.00
      6    43375.20   54.56    1.339  0.30( 0.29) 0.97   18466.1   20100.00
      7    45016.29   62.33    1.260  0.30( 0.29) 0.97   22795.2   31400.00
      8    46776.11   71.87    1.196  0.30( 0.29) 0.97   28001.2   13100.00
      9    48331.92   78.32    1.152  0.30( 0.29) 0.97   31105.9   11801.00
     10    50509.27   87.52    1.090  0.30( 0.29) 0.97   36147.7   11530.00
     11    51646.39   92.85    1.060  0.30( 0.29) 0.97   39796.3   13510.00
     12    52684.66   97.90    1.037  0.30( 0.29) 0.97   43147.5   13010.00
     13    53740.43  102.75    1.015  0.30( 0.29) 0.97   46396.0   11330.00
     14    54335.53  109.01    0.986  0.30( 0.29) 0.97   50826.3   11130.00
     15    53691.32  116.64    0.951  0.30( 0.29) 0.97   54816.6   12330.00
     16    52990.73  123.35    0.927  0.30( 0.29) 0.98   58159.6   12400.00
     17    51920.71  132.11    0.905  0.30( 0.29) 0.98   61527.0   12201.00
     18    50388.20  141.60    0.880  0.30( 0.29) 0.98   63982.6   12101.10
     19    49700.78  145.69    0.869  0.30( 0.29) 0.98   64833.4   10400.00
     20    47853.51  153.90    0.848  0.30( 0.29) 0.98   66145.5   12010.00
     21    46319.75  159.97    0.832  0.30( 0.29) 0.98   66462.0   10210.00
     22    41877.37  186.58    0.772  0.30( 0.29) 0.98   67194.1   10100.00
LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      854.15   29.90    1.864  0.30( 0.28) 0.94     599.8   10400.00
LONGEST FLOWPATH FROM NODE  10400.00 TO NODE  13802.00 =   12273.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1    32702.86   23.46    2.178  0.30( 0.29) 0.97    5569.9   10300.00
    2    33571.93   26.17    2.028  0.30( 0.29) 0.97    6209.9   21100.00
    3    34451.04   28.37    1.931  0.30( 0.29) 0.97    7100.7   10200.00
    4    35050.78   29.90    1.864  0.30( 0.29) 0.97    7709.1   10400.00
    5    37229.10   35.76    1.712  0.30( 0.29) 0.97    9919.5   20700.00
    6    40158.00   43.96    1.520  0.30( 0.29) 0.97   13417.4   10100.00
    7    43945.89   54.56    1.339  0.30( 0.29) 0.97   19065.9   20100.00
    8    45544.71   62.33    1.260  0.30( 0.29) 0.97   23394.9   31400.00
    9    47269.65   71.87    1.196  0.30( 0.29) 0.97   28601.0   13100.00
   10    48801.91   78.32    1.152  0.30( 0.29) 0.97   31705.7   11801.00
   11    50945.66   87.52    1.090  0.30( 0.29) 0.97   36747.5   11530.00
   12    52066.70   92.85    1.060  0.30( 0.29) 0.97   40396.1   13510.00
   13    53092.50   97.90    1.037  0.30( 0.29) 0.97   43747.3   13010.00
   14    54136.32  102.75    1.015  0.30( 0.29) 0.97   46995.8   11330.00
   15    54715.98  109.01    0.986  0.30( 0.29) 0.97   51426.1   11130.00
   16    54052.95  116.64    0.951  0.30( 0.29) 0.97   55416.3   12330.00
   17    53339.39  123.35    0.927  0.30( 0.29) 0.98   58759.4   12400.00
   18    52257.07  132.11    0.905  0.30( 0.29) 0.98   62126.8   12201.00
   19    50711.23  141.60    0.880  0.30( 0.29) 0.98   64582.4   12101.10
   20    50018.07  145.69    0.869  0.30( 0.29) 0.98   65433.1   10400.00
   21    48159.29  153.90    0.848  0.30( 0.29) 0.98   66745.3   12010.00
   22    46617.00  159.97    0.832  0.30( 0.29) 0.98   67061.8   10210.00
   23    42142.44  186.58    0.772  0.30( 0.29) 0.98   67793.9   10100.00
  TOTAL AREA(ACRES) =     67793.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =    54715.98  Tc(MIN.) =  109.008
  EFFECTIVE AREA(ACRES) =  51426.12  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    67793.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13802.00 =  130408.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13803.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    135.00  DOWNSTREAM(FEET) =    133.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   207.23   CHANNEL SLOPE =  0.0097
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  14.71
  CHANNEL FLOW THRU SUBAREA(CFS) =   54715.98
  FLOW VELOCITY(FEET/SEC.) =  23.42   FLOW DEPTH(FEET) =  14.71
  TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =  109.16
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13803.00 =  130616.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13802.00 TO NODE  13803.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    67793.9  TC(MIN.) =    109.16
  EFFECTIVE AREA(ACRES) =  51426.12  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.973
  PEAK FLOW RATE(CFS)   =   54715.98

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    32702.86   23.63    2.167  0.30( 0.29) 0.97    5569.9   10300.00
      2    33571.93   26.34    2.021  0.30( 0.29) 0.97    6209.9   21100.00
      3    34451.04   28.53    1.924  0.30( 0.29) 0.97    7100.7   10200.00
      4    35050.78   30.06    1.857  0.30( 0.29) 0.97    7709.1   10400.00
      5    37229.10   35.92    1.708  0.30( 0.29) 0.97    9919.5   20700.00
      6    40158.00   44.12    1.516  0.30( 0.29) 0.97   13417.4   10100.00
      7    43945.89   54.72    1.337  0.30( 0.29) 0.97   19065.9   20100.00
      8    45544.71   62.48    1.259  0.30( 0.29) 0.97   23394.9   31400.00
      9    47269.65   72.03    1.195  0.30( 0.29) 0.97   28601.0   13100.00
     10    48801.91   78.47    1.151  0.30( 0.29) 0.97   31705.7   11801.00
     11    50945.66   87.67    1.089  0.30( 0.29) 0.97   36747.5   11530.00
     12    52066.70   93.00    1.059  0.30( 0.29) 0.97   40396.1   13510.00
     13    53092.50   98.05    1.036  0.30( 0.29) 0.97   43747.3   13010.00
     14    54136.32  102.90    1.014  0.30( 0.29) 0.97   46995.8   11330.00
     15    54715.98  109.16    0.986  0.30( 0.29) 0.97   51426.1   11130.00
     16    54052.95  116.79    0.951  0.30( 0.29) 0.97   55416.3   12330.00
     17    53339.39  123.50    0.927  0.30( 0.29) 0.98   58759.4   12400.00
     18    52257.07  132.26    0.904  0.30( 0.29) 0.98   62126.8   12201.00
     19    50711.23  141.75    0.879  0.30( 0.29) 0.98   64582.4   12101.10
     20    50018.07  145.84    0.869  0.30( 0.29) 0.98   65433.1   10400.00
     21    48159.29  154.05    0.847  0.30( 0.29) 0.98   66745.3   12010.00
```



```
     22    46617.00  160.12    0.832  0.30( 0.29) 0.98   67061.8   10210.00
     23    42142.44  186.74    0.772  0.30( 0.29) 0.98   67793.9   10100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

--------------------------------------------------------------------------
  FILE NAME: S38.DAT
  TIME/DATE OF STUDY: 11:06 07/16/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.749
   2)   10.00;  3.727
   3)   15.00;  2.893
   4)   20.00;  2.393
   5)   25.00;  2.078
   6)   30.00;  1.857
   7)   40.00;  1.601
   8)   50.00;  1.389
   9)   60.00;  1.274
  10)   90.00;  1.070
  11)  120.00;  0.933
  12)  180.00;  0.777
  13)  360.00;  0.572
  14) 1200.00;  0.248
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
**************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 15.1
--------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
==========================================================================
  PEAK FLOWRATE TABLE FILE NAME: S37.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1    35050.78   30.06  0.30( 0.29) 0.97    7709.1   10400.00
      2    37229.10   35.92  0.30( 0.29) 0.97    9919.5   20700.00
      3    40158.00   44.12  0.30( 0.29) 0.97   13417.4   10100.00
      4    43945.89   54.72  0.30( 0.29) 0.97   19065.9   20100.00
      5    45544.71   62.48  0.30( 0.29) 0.97   23394.9   31400.00
      6    47269.65   72.03  0.30( 0.29) 0.97   28601.0   13100.00
      7    48801.91   78.47  0.30( 0.29) 0.97   31705.7   11801.00
      8    50945.66   87.67  0.30( 0.29) 0.97   36747.5   11530.00
      9    52066.70   93.00  0.30( 0.29) 0.97   40396.1   13510.00
     10    53092.50   98.05  0.30( 0.29) 0.97   43747.3   13010.00
     11    54136.32  102.90  0.30( 0.29) 0.97   46995.8   11330.00
     12    54715.98  109.16  0.30( 0.29) 0.97   51426.1   11130.00
     13    54052.95  116.79  0.30( 0.29) 0.97   55416.3   12330.00
     14    53339.39  123.50  0.30( 0.29) 0.98   58759.4   12400.00
     15    52257.07  132.26  0.30( 0.29) 0.98   62126.8   12201.00
     16    50711.23  141.75  0.30( 0.29) 0.98   64582.4   12101.10
     17    50018.07  145.84  0.30( 0.29) 0.98   65433.1   10400.00
     18    48159.29  154.05  0.30( 0.29) 0.98   66745.3   12010.00
     19    46617.00  160.12  0.30( 0.29) 0.98   67061.8   10210.00
     20    42142.44  186.74  0.30( 0.29) 0.98   67793.9   10100.00
   TOTAL AREA(ACRES) =    67793.9

**************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13803.00 IS CODE = 14.0
--------------------------------------------------------------------------
  >>>>>MEMORY BANK #  1 COPIED ONTO MAIN-STREAM MEMORY<<<<<
==========================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1    35050.78   30.06  0.30( 0.29) 0.97    7709.1   10400.00
      2    37229.10   35.92  0.30( 0.29) 0.97    9919.5   20700.00
      3    40158.00   44.12  0.30( 0.29) 0.97   13417.4   10100.00
      4    43945.89   54.72  0.30( 0.29) 0.97   19065.9   20100.00
      5    45544.71   62.48  0.30( 0.29) 0.97   23394.9   31400.00
      6    47269.65   72.03  0.30( 0.29) 0.97   28601.0   13100.00
      7    48801.91   78.47  0.30( 0.29) 0.97   31705.7   11801.00
      8    50945.66   87.67  0.30( 0.29) 0.97   36747.5   11530.00
      9    52066.70   93.00  0.30( 0.29) 0.97   40396.1   13510.00
     10    53092.50   98.05  0.30( 0.29) 0.97   43747.3   13010.00
     11    54136.32  102.90  0.30( 0.29) 0.97   46995.8   11330.00
     12    54715.98  109.16  0.30( 0.29) 0.97   51426.1   11130.00
     13    54052.95  116.79  0.30( 0.29) 0.97   55416.3   12330.00
     14    53339.39  123.50  0.30( 0.29) 0.98   58759.4   12400.00
     15    52257.07  132.26  0.30( 0.29) 0.98   62126.8   12201.00
     16    50711.23  141.75  0.30( 0.29) 0.98   64582.4   12101.10
     17    50018.07  145.84  0.30( 0.29) 0.98   65433.1   10400.00
     18    48159.29  154.05  0.30( 0.29) 0.98   66745.3   12010.00
```

```
     19    46617.00  160.12  0.30( 0.29) 0.98   67061.8   10210.00
     20    42142.44  186.74  0.30( 0.29) 0.98   67793.9   10100.00
    TOTAL AREA(ACRES) =     67793.9

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    140.00  DOWNSTREAM(FEET) =    137.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   926.91   CHANNEL SLOPE =  0.0032
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  19.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  0.978
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       53.70      0.30     0.983     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.983
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   54732.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  15.81
  AVERAGE FLOW DEPTH(FEET) =  19.47   TRAVEL TIME(MIN.) =   0.98
  Tc(MIN.) =  110.13
  SUBAREA AREA(ACRES) =    53.70       SUBAREA RUNOFF(CFS) =   33.02
  EFFECTIVE AREA(ACRES) =  51479.82     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    67847.6         PEAK FLOW RATE(CFS) =   54715.98
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  19.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 19.46   FLOW VELOCITY(FEET/SEC.) =  15.81
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13820.00 =  131542.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13803.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  110.13
  RAINFALL INTENSITY(INCH/HR) =   0.98
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   51479.82
  TOTAL STREAM AREA(ACRES) =   67847.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   54715.98

****************************************************************************
  FLOW PROCESS FROM NODE  13810.00 TO NODE  13811.00 IS CODE =  21
----------------------------------------------------------------------------
```



```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   648.54
  ELEVATION DATA: UPSTREAM(FEET) =    756.46  DOWNSTREAM(FEET) =    586.02

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.293
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.345
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.58      0.30     1.000     0   12.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     15.29
  TOTAL AREA(ACRES) =      5.58   PEAK FLOW RATE(CFS) =     15.29

****************************************************************************
  FLOW PROCESS FROM NODE  13811.00 TO NODE  13811.50 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    586.02  DOWNSTREAM(FEET) =    437.69
  CHANNEL LENGTH THRU SUBAREA(FEET) =   696.28   CHANNEL SLOPE =  0.2130
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.044
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.79      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.45
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =   14.09
  SUBAREA AREA(ACRES) =    14.79       SUBAREA RUNOFF(CFS) =   36.53
  EFFECTIVE AREA(ACRES) =     20.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      50.31
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   7.49
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13811.50 =    1344.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13811.50 TO NODE  13812.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    437.69  DOWNSTREAM(FEET) =    402.36
  CHANNEL LENGTH THRU SUBAREA(FEET) =   681.04   CHANNEL SLOPE =  0.0519
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.768
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.41      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.27
  AVERAGE FLOW DEPTH(FEET) =   1.10   TRAVEL TIME(MIN.) =   2.16
  Tc(MIN.) =   16.25
  SUBAREA AREA(ACRES) =    18.41       SUBAREA RUNOFF(CFS) =   40.90
  EFFECTIVE AREA(ACRES) =     38.78     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       38.8         PEAK FLOW RATE(CFS) =      86.15
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.23   FLOW VELOCITY(FEET/SEC.) =   5.60
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13812.00 =    2025.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13812.00 TO NODE  13813.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    402.36  DOWNSTREAM(FEET) =    259.72
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1282.56   CHANNEL SLOPE =  0.1112
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.500
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.87      0.30     0.858     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.858
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     114.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.96
  AVERAGE FLOW DEPTH(FEET) =   1.16   TRAVEL TIME(MIN.) =   2.68
  Tc(MIN.) =   18.93
  SUBAREA AREA(ACRES) =    27.87       SUBAREA RUNOFF(CFS) =   56.24
  EFFECTIVE AREA(ACRES) =     66.65     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       66.7         PEAK FLOW RATE(CFS) =     133.02
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.27
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.27   FLOW VELOCITY(FEET/SEC.) =   8.34
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13813.00 =    3308.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   259.72  DOWNSTREAM(FEET) =   137.00
  FLOW LENGTH(FEET) =  2412.88   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.94
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     133.02
  PIPE TRAVEL TIME(MIN.) =   1.75    Tc(MIN.) =   20.69
  LONGEST FLOWPATH FROM NODE  13810.00 TO NODE  13820.00 =    5721.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   20.69
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.350
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       82.54      0.30     0.570     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.570
  SUBAREA AREA(ACRES) =   82.54       SUBAREA RUNOFF(CFS) =  161.85
  EFFECTIVE AREA(ACRES) =    149.19   AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =      149.2       PEAK FLOW RATE(CFS) =     285.88

****************************************************************************
  FLOW PROCESS FROM NODE  13813.00 TO NODE  13820.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.69
  RAINFALL INTENSITY(INCH/HR) =   2.35
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.74
  EFFECTIVE STREAM AREA(ACRES) =     149.19
  TOTAL STREAM AREA(ACRES) =     149.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     285.88

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	35050.78	31.17	1.827	0.30(0.29)	0.97	7762.8	10400.00
1	37229.10	37.01	1.678	0.30(0.29)	0.97	9973.2	20700.00
1	40158.00	45.18	1.491	0.30(0.29)	0.97	13471.1	10100.00
1	43945.89	55.75	1.323	0.30(0.29)	0.97	19119.6	20100.00
1	45544.71	63.51	1.250	0.30(0.29)	0.97	23448.6	31400.00
1	47269.65	73.05	1.185	0.30(0.29)	0.97	28654.7	13100.00
1	48801.91	79.48	1.142	0.30(0.29)	0.97	31759.4	11801.00
1	50945.66	88.67	1.079	0.30(0.29)	0.97	36801.2	11530.00
1	52066.70	93.99	1.052	0.30(0.29)	0.97	40449.8	13510.00
1	53092.50	99.04	1.029	0.30(0.29)	0.97	43801.0	13010.00
1	54136.32	103.88	1.007	0.30(0.29)	0.97	47049.5	11330.00
1	54715.98	110.13	0.978	0.30(0.29)	0.97	51479.8	11130.00
1	54052.95	117.77	0.943	0.30(0.29)	0.97	55470.0	12330.00
1	53339.39	124.48	0.921	0.30(0.29)	0.98	58813.1	12400.00
1	52257.07	133.25	0.899	0.30(0.29)	0.98	62180.5	12201.00
1	50711.23	142.75	0.874	0.30(0.29)	0.98	64636.1	12101.10
1	50018.07	146.85	0.863	0.30(0.29)	0.98	65486.8	10400.00
1	48159.29	155.06	0.842	0.30(0.29)	0.98	66799.0	12010.00
1	46617.00	161.14	0.826	0.30(0.29)	0.98	67115.5	10210.00
1	42142.44	187.79	0.768	0.30(0.29)	0.98	67847.6	10100.00
2	285.88	20.69	2.350	0.30(0.22)	0.74	149.2	13810.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31467.17	20.69	2.350	0.30(0.29)	0.97	5301.1	13810.00
2	35266.48	31.17	1.827	0.30(0.29)	0.97	7912.0	10400.00
3	37424.73	37.01	1.678	0.30(0.29)	0.97	10122.3	20700.00
4	40328.59	45.18	1.491	0.30(0.29)	0.97	13620.3	10100.00
5	44093.89	55.75	1.323	0.30(0.29)	0.97	19268.8	20100.00
6	45682.95	63.51	1.250	0.30(0.29)	0.97	23597.8	31400.00
7	47399.18	73.05	1.185	0.30(0.29)	0.96	28803.9	13100.00
8	48925.55	79.48	1.142	0.30(0.29)	0.96	31908.6	11801.00
9	51060.93	88.67	1.079	0.30(0.29)	0.97	36950.4	11530.00
10	52178.30	93.99	1.052	0.30(0.29)	0.97	40598.9	13510.00
11	53201.00	99.04	1.029	0.30(0.29)	0.97	43950.2	13010.00
12	54241.85	103.88	1.007	0.30(0.29)	0.97	47198.6	11330.00
13	54817.69	110.13	0.978	0.30(0.29)	0.97	51629.0	11130.00
14	54149.97	117.77	0.943	0.30(0.29)	0.97	55619.2	12330.00
15	53433.48	124.48	0.921	0.30(0.29)	0.97	58962.3	12400.00
16	52348.10	133.25	0.899	0.30(0.29)	0.98	62329.7	12201.00
17	50798.95	142.75	0.874	0.30(0.29)	0.98	64785.3	12101.10
18	50104.35	146.85	0.863	0.30(0.29)	0.98	65636.0	10400.00
19	48242.70	155.06	0.842	0.30(0.29)	0.98	66948.1	12010.00
20	46698.29	161.14	0.826	0.30(0.29)	0.98	67264.7	10210.00
21	42215.96	187.79	0.768	0.30(0.29)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 54817.69 Tc(MIN.) = 110.13
EFFECTIVE AREA(ACRES) = 51629.01 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 67996.7
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

****

FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 137.00 DOWNSTREAM(FEET) = 133.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1261.34 CHANNEL SLOPE = 0.0032
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 19.58
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.972
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.60	0.30	0.683	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54828.59
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.70
AVERAGE FLOW DEPTH(FEET) = 19.58 TRAVEL TIME(MIN.) = 1.34
Tc(MIN.) = 111.47
SUBAREA AREA(ACRES) = 31.60 SUBAREA RUNOFF(CFS) = 21.82
EFFECTIVE AREA(ACRES) = 51660.61 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 68028.3 PEAK FLOW RATE(CFS) = 54817.69
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 19.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 19.58 FLOW VELOCITY(FEET/SEC.) = 15.70
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

****

FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 111.47
RAINFALL INTENSITY(INCH/HR) = 0.97
AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97
EFFECTIVE STREAM AREA(ACRES) = 51660.61
TOTAL STREAM AREA(ACRES) = 68028.34
PEAK FLOW RATE(CFS) AT CONFLUENCE = 54817.69

****

FLOW PROCESS FROM NODE 13830.00 TO NODE 13831.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 744.71
ELEVATION DATA: UPSTREAM(FEET) = 1100.95 DOWNSTREAM(FEET) = 959.21

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.858
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.083
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        5.06      0.30     1.000     0   13.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     12.68
  TOTAL AREA(ACRES) =      5.06   PEAK FLOW RATE(CFS) =     12.68

****************************************************************************
  FLOW PROCESS FROM NODE  13831.00 TO NODE  13832.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    959.21  DOWNSTREAM(FEET) =    832.83
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1076.71   CHANNEL SLOPE =  0.1174
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.711
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.57      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.06
  AVERAGE FLOW DEPTH(FEET) =   0.70   TRAVEL TIME(MIN.) =   2.96
  Tc(MIN.) =   16.82
  SUBAREA AREA(ACRES) =    32.57       SUBAREA RUNOFF(CFS) =   70.68
  EFFECTIVE AREA(ACRES) =     37.63     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       37.6         PEAK FLOW RATE(CFS) =      81.66
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   7.23
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13832.00 =    1821.42 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13832.00 TO NODE  13833.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    832.83  DOWNSTREAM(FEET) =    572.49
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1883.58   CHANNEL SLOPE =  0.1382
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
```



```
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.11
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.361
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.23      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     111.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.49
  AVERAGE FLOW DEPTH(FEET) =   1.08   TRAVEL TIME(MIN.) =   3.70
  Tc(MIN.) =   20.51
  SUBAREA AREA(ACRES) =    32.23       SUBAREA RUNOFF(CFS) =   59.77
  EFFECTIVE AREA(ACRES) =     69.86     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       69.9         PEAK FLOW RATE(CFS) =     129.56
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.18   FLOW VELOCITY(FEET/SEC.) =   8.90
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13833.00 =    3705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13833.00 TO NODE  13834.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    572.49  DOWNSTREAM(FEET) =    471.65
  CHANNEL LENGTH THRU SUBAREA(FEET) =   943.78   CHANNEL SLOPE =  0.1068
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.246
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.51      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     153.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.62
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   1.82
  Tc(MIN.) =   22.34
  SUBAREA AREA(ACRES) =    27.51       SUBAREA RUNOFF(CFS) =   48.18
  EFFECTIVE AREA(ACRES) =     97.37     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       97.4         PEAK FLOW RATE(CFS) =     170.51
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.48   FLOW VELOCITY(FEET/SEC.) =   8.91
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13834.00 =    4648.78 FEET.
```

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****************************************************************************
  FLOW PROCESS FROM NODE  13834.00 TO NODE  13835.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    471.65  DOWNSTREAM(FEET) =    347.06
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1647.45   CHANNEL SLOPE =  0.0756
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.02
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.058
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       94.21      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     245.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.82
  AVERAGE FLOW DEPTH(FEET) =   1.99   TRAVEL TIME(MIN.) =   3.11
  Tc(MIN.) =   25.45
  SUBAREA AREA(ACRES) =    94.21       SUBAREA RUNOFF(CFS) =  149.07
  EFFECTIVE AREA(ACRES) =    191.58     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      191.6         PEAK FLOW RATE(CFS) =     303.14
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   2.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.23   FLOW VELOCITY(FEET/SEC.) =   9.39
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13835.00 =    6296.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13835.00 TO NODE  13836.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    347.06  DOWNSTREAM(FEET) =    269.29
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1696.71   CHANNEL SLOPE =  0.0458
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.918
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      233.25      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     473.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.90
  AVERAGE FLOW DEPTH(FEET) =   3.23   TRAVEL TIME(MIN.) =   3.18
  Tc(MIN.) =   28.63
  SUBAREA AREA(ACRES) =   233.25       SUBAREA RUNOFF(CFS) =  339.58
  EFFECTIVE AREA(ACRES) =    424.83     AREA-AVERAGED Fm(INCH/HR) =   0.30
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  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      424.8         PEAK FLOW RATE(CFS) =     618.49
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.71   FLOW VELOCITY(FEET/SEC.) =   9.59
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13836.00 =    7992.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13836.00 TO NODE  13837.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    269.29  DOWNSTREAM(FEET) =    191.87
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2529.21   CHANNEL SLOPE =  0.0306
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.766
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      134.70      0.30     0.880     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     709.58
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.58
  AVERAGE FLOW DEPTH(FEET) =   4.40   TRAVEL TIME(MIN.) =   4.91
  Tc(MIN.) =   33.54
  SUBAREA AREA(ACRES) =   134.70       SUBAREA RUNOFF(CFS) =  182.13
  EFFECTIVE AREA(ACRES) =    559.53     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =      559.5         PEAK FLOW RATE(CFS) =     742.79
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.50   FLOW VELOCITY(FEET/SEC.) =   8.69
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13837.00 =   10522.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   191.87  DOWNSTREAM(FEET) =   133.00
  FLOW LENGTH(FEET) =  1151.02   MANNING'S N =  0.013
  DEPTH OF FLOW IN  69.0 INCH PIPE IS  51.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  35.42
  ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     742.79
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   34.08
  LONGEST FLOWPATH FROM NODE  13830.00 TO NODE  13840.00 =   11673.17 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   34.08
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.752
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        5.97      0.30     0.622     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.622
  SUBAREA AREA(ACRES) =    5.97      SUBAREA RUNOFF(CFS) =    8.41
  EFFECTIVE AREA(ACRES) =    565.50   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =      565.5       PEAK FLOW RATE(CFS) =     744.23

****************************************************************************
  FLOW PROCESS FROM NODE  13837.00 TO NODE  13840.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.08
  RAINFALL INTENSITY(INCH/HR) =   1.75
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =     565.50
  TOTAL STREAM AREA(ACRES) =     565.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     744.23

  ** CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    31467.17   22.25    2.251  0.30( 0.29) 0.96    5332.7   13810.00
      1    35266.48   32.68    1.788  0.30( 0.29) 0.97    7943.6   10400.00
      1    37424.73   38.50    1.639  0.30( 0.29) 0.97   10153.9   20700.00
      1    40328.59   46.64    1.460  0.30( 0.29) 0.97   13651.9   10100.00
      1    44093.89   57.18    1.306  0.30( 0.29) 0.97   19300.4   20100.00
      1    45682.95   64.92    1.241  0.30( 0.29) 0.97   23629.4   31400.00
      1    47399.18   74.44    1.176  0.30( 0.29) 0.96   28835.5   13100.00
      1    48925.55   80.86    1.132  0.30( 0.29) 0.96   31940.2   11801.00
      1    51060.93   90.03    1.070  0.30( 0.29) 0.97   36982.0   11530.00
      1    52178.30   95.34    1.046  0.30( 0.29) 0.97   40630.5   13510.00
      1    53201.00  100.39    1.023  0.30( 0.29) 0.97   43981.8   13010.00
      1    54241.85  105.22    1.000  0.30( 0.29) 0.97   47230.2   11330.00
      1    54817.69  111.47    0.972  0.30( 0.29) 0.97   51660.6   11130.00
      1    54149.97  119.12    0.937  0.30( 0.29) 0.97   55650.8   12330.00
      1    53433.48  125.83    0.918  0.30( 0.29) 0.97   58993.9   12400.00
      1    52348.10  134.61    0.895  0.30( 0.29) 0.97   62361.3   12201.00
      1    50798.95  144.11    0.870  0.30( 0.29) 0.98   64816.9   12101.10
      1    50104.35  148.22    0.860  0.30( 0.29) 0.98   65667.6   10400.00
      1    48242.70  156.45    0.838  0.30( 0.29) 0.98   66979.8   12010.00
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```
      1    46698.29  162.54    0.822  0.30( 0.29) 0.98   67296.3   10210.00
      1    42215.96  189.23    0.766  0.30( 0.29) 0.98   68028.3   10100.00
      2      744.23   34.08    1.752  0.30( 0.29) 0.97     565.5   13830.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    32118.73   22.25    2.251  0.30( 0.29) 0.96    5701.9   13810.00
      2    35997.62   32.68    1.788  0.30( 0.29) 0.97    8485.9   10400.00
      3    36530.46   34.08    1.752  0.30( 0.29) 0.97    9041.4   13830.00
      4    38111.46   38.50    1.639  0.30( 0.29) 0.97   10719.4   20700.00
      5    40924.07   46.64    1.460  0.30( 0.29) 0.97   14217.4   10100.00
      6    44611.13   57.18    1.306  0.30( 0.29) 0.97   19865.9   20100.00
      7    46166.65   64.92    1.241  0.30( 0.29) 0.97   24194.9   31400.00
      8    47849.93   74.44    1.176  0.30( 0.29) 0.96   29401.0   13100.00
      9    49354.07   80.86    1.132  0.30( 0.29) 0.96   32505.7   11801.00
     10    51457.75   90.03    1.070  0.30( 0.29) 0.97   37547.5   11530.00
     11    52562.78   95.34    1.046  0.30( 0.29) 0.97   41196.0   13510.00
     12    53573.77  100.39    1.023  0.30( 0.29) 0.97   44547.3   13010.00
     13    54603.37  105.22    1.000  0.30( 0.29) 0.97   47795.7   11330.00
     14    55164.68  111.47    0.972  0.30( 0.29) 0.97   52226.1   11130.00
     15    54479.20  119.12    0.937  0.30( 0.29) 0.97   56216.3   12330.00
     16    53752.94  125.83    0.918  0.30( 0.29) 0.97   59559.4   12400.00
     17    52655.94  134.61    0.895  0.30( 0.29) 0.97   62926.8   12201.00
     18    51094.21  144.11    0.870  0.30( 0.29) 0.97   65382.4   12101.10
     19    50394.18  148.22    0.860  0.30( 0.29) 0.98   66233.1   10400.00
     20    48521.64  156.45    0.838  0.30( 0.29) 0.98   67545.2   12010.00
     21    46969.17  162.54    0.822  0.30( 0.29) 0.98   67861.8   10210.00
     22    42458.39  189.23    0.766  0.30( 0.29) 0.98   68593.8   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   55164.68    Tc(MIN.) =   111.47
  EFFECTIVE AREA(ACRES) =   52226.11   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68593.8
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13840.00 =  132804.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13840.00 TO NODE  13860.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    133.00  DOWNSTREAM(FEET) =    130.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.44   CHANNEL SLOPE =  0.0046
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  17.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  0.969
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.61      0.30     0.975     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.975
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   55166.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  17.97
  AVERAGE FLOW DEPTH(FEET) =  17.89   TRAVEL TIME(MIN.) =   0.61
  Tc(MIN.) =  112.08
  SUBAREA AREA(ACRES) =     6.61       SUBAREA RUNOFF(CFS) =    4.03
  EFFECTIVE AREA(ACRES) =  52232.72     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    68600.5         PEAK FLOW RATE(CFS) =   55164.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  17.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 17.89   FLOW VELOCITY(FEET/SEC.) =  17.97
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13860.00 =  133458.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13840.00 TO NODE  13860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  112.08
  RAINFALL INTENSITY(INCH/HR) =   0.97
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52232.72
  TOTAL STREAM AREA(ACRES) =   68600.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   55164.68

****************************************************************************
  FLOW PROCESS FROM NODE  13850.00 TO NODE  13851.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   617.57
  ELEVATION DATA: UPSTREAM(FEET) =    646.95  DOWNSTREAM(FEET) =    490.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.137
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.371
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      -        4.95      0.30     1.000     0   12.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.68
  TOTAL AREA(ACRES) =      4.95   PEAK FLOW RATE(CFS) =     13.68

****************************************************************************
  FLOW PROCESS FROM NODE  13851.00 TO NODE  13851.50 IS CODE =  56
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.10  DOWNSTREAM(FEET) =    440.98
  CHANNEL LENGTH THRU SUBAREA(FEET) =   351.14   CHANNEL SLOPE =  0.1399
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.160
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.02      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.63
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   1.26
  Tc(MIN.) =   13.40
  SUBAREA AREA(ACRES) =     4.02       SUBAREA RUNOFF(CFS) =   10.35
  EFFECTIVE AREA(ACRES) =      8.97     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        9.0         PEAK FLOW RATE(CFS) =      23.09
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   4.94
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13851.50 =     968.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13851.50 TO NODE  13852.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    440.98  DOWNSTREAM(FEET) =    395.76
  CHANNEL LENGTH THRU SUBAREA(FEET) =   512.91   CHANNEL SLOPE =  0.0882
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.60
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.873
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.17      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.76
  AVERAGE FLOW DEPTH(FEET) =   0.59   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =   15.20
  SUBAREA AREA(ACRES) =     7.17       SUBAREA RUNOFF(CFS) =   16.60
  EFFECTIVE AREA(ACRES) =     16.14     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       16.1         PEAK FLOW RATE(CFS) =      37.38
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
```

```
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.65   FLOW VELOCITY(FEET/SEC.) =   5.06
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13852.00 =    1481.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13852.00 TO NODE  13853.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    395.76  DOWNSTREAM(FEET) =    354.94
  CHANNEL LENGTH THRU SUBAREA(FEET) =   443.69   CHANNEL SLOPE =  0.0920
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.72
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.738
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.76      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.49
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   1.35
  Tc(MIN.) =   16.55
  SUBAREA AREA(ACRES) =     6.76       SUBAREA RUNOFF(CFS) =   14.84
  EFFECTIVE AREA(ACRES) =     22.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       22.9         PEAK FLOW RATE(CFS) =      50.26
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOW VELOCITY(FEET/SEC.) =   5.69
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13853.00 =    1925.31 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13853.00 TO NODE  13854.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    354.94  DOWNSTREAM(FEET) =    263.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   962.09   CHANNEL SLOPE =  0.0950
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.92
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.487
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       18.16      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```



```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      68.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.38
  AVERAGE FLOW DEPTH(FEET) =   0.91   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   19.06
  SUBAREA AREA(ACRES) =    18.16       SUBAREA RUNOFF(CFS) =   35.74
  EFFECTIVE AREA(ACRES) =     41.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       41.1         PEAK FLOW RATE(CFS) =      80.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.00   FLOW VELOCITY(FEET/SEC.) =   6.72
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13854.00 =    2887.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13854.00 TO NODE  13855.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    263.57  DOWNSTREAM(FEET) =    188.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1228.77   CHANNEL SLOPE =  0.0609
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.254
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       38.75      0.30     0.879     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.879
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     115.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.50
  AVERAGE FLOW DEPTH(FEET) =   1.39   TRAVEL TIME(MIN.) =   3.15
  Tc(MIN.) =   22.21
  SUBAREA AREA(ACRES) =    38.75       SUBAREA RUNOFF(CFS) =   69.40
  EFFECTIVE AREA(ACRES) =     79.81     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.94
  TOTAL AREA(ACRES) =       79.8         PEAK FLOW RATE(CFS) =     141.59
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.56   FLOW VELOCITY(FEET/SEC.) =   6.92
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13855.00 =    4116.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   188.74  DOWNSTREAM(FEET) =   130.00
```

```
  FLOW LENGTH(FEET) =  2092.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.77
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     141.59
  PIPE TRAVEL TIME(MIN.) =   1.86    Tc(MIN.) =   24.07
  LONGEST FLOWPATH FROM NODE  13850.00 TO NODE  13860.00 =    6208.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.136
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.41      0.30     0.707     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.707
  SUBAREA AREA(ACRES) =   43.41      SUBAREA RUNOFF(CFS) =   75.19
  EFFECTIVE AREA(ACRES) =    123.22   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.86
  TOTAL AREA(ACRES) =      123.2       PEAK FLOW RATE(CFS) =     208.37

****************************************************************************
  FLOW PROCESS FROM NODE  13855.00 TO NODE  13860.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.07
  RAINFALL INTENSITY(INCH/HR) =   2.14
  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.86
  EFFECTIVE STREAM AREA(ACRES) =     123.22
  TOTAL STREAM AREA(ACRES) =     123.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     208.37

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    32118.73   22.96    2.207  0.30( 0.29) 0.96    5708.5   13810.00
      1    35997.62   33.37    1.771  0.30( 0.29) 0.97    8492.5   10400.00
      1    36530.46   34.77    1.735  0.30( 0.29) 0.97    9048.0   13830.00
      1    38111.46   39.17    1.622  0.30( 0.29) 0.97   10726.1   20700.00
      1    40924.07   47.30    1.446  0.30( 0.29) 0.97   14224.0   10100.00
      1    44611.13   57.82    1.299  0.30( 0.29) 0.97   19872.5   20100.00
      1    46166.65   65.56    1.236  0.30( 0.29) 0.97   24201.5   31400.00
      1    47849.93   75.07    1.172  0.30( 0.29) 0.96   29407.6   13100.00
      1    49354.07   81.49    1.128  0.30( 0.29) 0.96   32512.3   11801.00
      1    51457.75   90.65    1.067  0.30( 0.29) 0.97   37554.1   11530.00
      1    52562.78   95.96    1.043  0.30( 0.29) 0.97   41202.7   13510.00
      1    53573.77  101.00    1.020  0.30( 0.29) 0.97   44553.9   13010.00
```



```
      1    54603.37  105.83    0.998  0.30( 0.29) 0.97   47802.4   11330.00
      1    55164.68  112.08    0.969  0.30( 0.29) 0.97   52232.7   11130.00
      1    54479.20  119.72    0.934  0.30( 0.29) 0.97   56222.9   12330.00
      1    53752.94  126.44    0.916  0.30( 0.29) 0.97   59566.0   12400.00
      1    52655.94  135.22    0.893  0.30( 0.29) 0.97   62933.4   12201.00
      1    51094.21  144.74    0.869  0.30( 0.29) 0.97   65389.0   12101.10
      1    50394.18  148.84    0.858  0.30( 0.29) 0.98   66239.7   10400.00
      1    48521.64  157.08    0.837  0.30( 0.29) 0.98   67551.9   12010.00
      1    46969.17  163.18    0.821  0.30( 0.29) 0.98   67868.4   10210.00
      1    42458.39  189.88    0.766  0.30( 0.29) 0.98   68600.5   10100.00
      2      208.37   24.07    2.136  0.30( 0.26) 0.86     123.2   13850.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    32324.88   22.96    2.207  0.30( 0.29) 0.96    5826.0   13810.00
      2    32741.74   24.07    2.136  0.30( 0.29) 0.96    6129.3   13850.00
      3    36165.43   33.37    1.771  0.30( 0.29) 0.97    8615.7   10400.00
      4    36694.31   34.77    1.735  0.30( 0.29) 0.97    9171.2   13830.00
      5    38262.80   39.17    1.622  0.30( 0.29) 0.97   10849.3   20700.00
      6    41055.88   47.30    1.446  0.30( 0.29) 0.97   14347.3   10100.00
      7    44726.63   57.82    1.299  0.30( 0.29) 0.97   19995.7   20100.00
      8    46275.18   65.56    1.236  0.30( 0.29) 0.97   24324.8   31400.00
      9    47951.29   75.07    1.172  0.30( 0.29) 0.96   29530.8   13100.00
     10    49450.59   81.49    1.128  0.30( 0.29) 0.96   32635.5   11801.00
     11    51547.52   90.65    1.067  0.30( 0.29) 0.97   37677.3   11530.00
     12    52649.86   95.96    1.043  0.30( 0.29) 0.97   41325.9   13510.00
     13    53658.29  101.00    1.020  0.30( 0.29) 0.97   44677.1   13010.00
     14    54685.45  105.83    0.998  0.30( 0.29) 0.97   47925.6   11330.00
     15    55243.60  112.08    0.969  0.30( 0.29) 0.97   52355.9   11130.00
     16    54554.25  119.72    0.934  0.30( 0.29) 0.97   56346.2   12330.00
     17    53825.99  126.44    0.916  0.30( 0.29) 0.97   59689.2   12400.00
     18    52726.46  135.22    0.893  0.30( 0.29) 0.97   63056.6   12201.00
     19    51161.98  144.74    0.869  0.30( 0.29) 0.97   65512.2   12101.10
     20    50460.77  148.84    0.858  0.30( 0.29) 0.98   66363.0   10400.00
     21    48585.86  157.08    0.837  0.30( 0.29) 0.98   67675.1   12010.00
     22    47031.62  163.18    0.821  0.30( 0.29) 0.98   67991.6   10210.00
     23    42514.74  189.88    0.766  0.30( 0.29) 0.98   68723.7   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   55243.60    Tc(MIN.) =   112.08
  EFFECTIVE AREA(ACRES) =   52355.94   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68723.7
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13860.00 =  133458.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13860.00 TO NODE  13880.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    130.00  DOWNSTREAM(FEET) =    120.57
  CHANNEL LENGTH THRU SUBAREA(FEET) =   610.77   CHANNEL SLOPE =  0.0154
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
```

```
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  0.968
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       4.89      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   55245.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  27.77
  AVERAGE FLOW DEPTH(FEET) =  13.07   TRAVEL TIME(MIN.) =   0.37
  Tc(MIN.) =  112.44
  SUBAREA AREA(ACRES) =     4.89       SUBAREA RUNOFF(CFS) =    2.94
  EFFECTIVE AREA(ACRES) =  52360.83     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    68728.6         PEAK FLOW RATE(CFS) =   55243.60
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  13.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 13.07   FLOW VELOCITY(FEET/SEC.) =  27.77
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13880.00 =  134069.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13860.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  112.44
  RAINFALL INTENSITY(INCH/HR) =   0.97
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52360.83
  TOTAL STREAM AREA(ACRES) =   68728.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   55243.60

****************************************************************************
  FLOW PROCESS FROM NODE  13870.00 TO NODE  13871.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   872.65
  ELEVATION DATA: UPSTREAM(FEET) =    558.52  DOWNSTREAM(FEET) =    436.47

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.704
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.823
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
```



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  "GRASS"                    -       9.32      0.30     1.000     0   15.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     21.16
  TOTAL AREA(ACRES) =      9.32   PEAK FLOW RATE(CFS) =     21.16

****************************************************************************
  FLOW PROCESS FROM NODE  13871.00 TO NODE  13872.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    436.47  DOWNSTREAM(FEET) =    337.62
  CHANNEL LENGTH THRU SUBAREA(FEET) =   827.95   CHANNEL SLOPE =  0.1194
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.60
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.572
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       14.27      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.50
  AVERAGE FLOW DEPTH(FEET) =   0.58   TRAVEL TIME(MIN.) =   2.51
  Tc(MIN.) =   18.21
  SUBAREA AREA(ACRES) =    14.27       SUBAREA RUNOFF(CFS) =   29.18
  EFFECTIVE AREA(ACRES) =     23.59     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =      48.23
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   6.13
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13872.00 =    1700.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13872.00 TO NODE  13873.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    337.62  DOWNSTREAM(FEET) =    253.88
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1049.16   CHANNEL SLOPE =  0.0798
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.08
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.332
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       35.74      0.30     0.923     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.923
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.36
  AVERAGE FLOW DEPTH(FEET) =   1.06   TRAVEL TIME(MIN.) =   2.75
  Tc(MIN.) =   20.96
  SUBAREA AREA(ACRES) =    35.74       SUBAREA RUNOFF(CFS) =   66.12
  EFFECTIVE AREA(ACRES) =     59.33     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.95
  TOTAL AREA(ACRES) =       59.3         PEAK FLOW RATE(CFS) =     109.27
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.060
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.25   FLOW VELOCITY(FEET/SEC.) =   7.00
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13873.00 =    2749.76 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13873.00 TO NODE  13874.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    253.88  DOWNSTREAM(FEET) =    160.73
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1518.60   CHANNEL SLOPE =  0.0613
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.156
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       32.43      0.30     0.900     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     136.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.05
  AVERAGE FLOW DEPTH(FEET) =   1.22   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   23.76
  SUBAREA AREA(ACRES) =    32.43       SUBAREA RUNOFF(CFS) =   55.05
  EFFECTIVE AREA(ACRES) =     91.76     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       91.8         PEAK FLOW RATE(CFS) =     154.92
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.30   FLOW VELOCITY(FEET/SEC.) =   9.44
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13874.00 =    4268.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13874.00 TO NODE  13875.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    160.73  DOWNSTREAM(FEET) =    158.14
  CHANNEL LENGTH THRU SUBAREA(FEET) =   582.74   CHANNEL SLOPE =  0.0044
```



```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.20
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.028
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       73.67      0.30     0.930     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.930
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     212.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.11
  AVERAGE FLOW DEPTH(FEET) =   3.17   TRAVEL TIME(MIN.) =   2.36
  Tc(MIN.) =   26.12
  SUBAREA AREA(ACRES) =    73.67       SUBAREA RUNOFF(CFS) =  116.00
  EFFECTIVE AREA(ACRES) =    165.43     AREA-AVERAGED Fm(INCH/HR) =   0.28
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =      165.4         PEAK FLOW RATE(CFS) =     260.37
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.51   FLOW VELOCITY(FEET/SEC.) =   4.35
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13875.00 =    4851.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.14  DOWNSTREAM(FEET) =   120.57
  FLOW LENGTH(FEET) =  1855.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  43.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.02
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     260.37
  PIPE TRAVEL TIME(MIN.) =   1.63    Tc(MIN.) =   27.75
  LONGEST FLOWPATH FROM NODE  13870.00 TO NODE  13880.00 =    6706.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   27.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.957
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       34.90      0.30     0.743     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.743
  SUBAREA AREA(ACRES) =   34.90       SUBAREA RUNOFF(CFS) =   54.46
  EFFECTIVE AREA(ACRES) =    200.33   AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.90
  TOTAL AREA(ACRES) =      200.3       PEAK FLOW RATE(CFS) =     304.13
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  13875.00 TO NODE  13880.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.75
  RAINFALL INTENSITY(INCH/HR) =   1.96
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.90
  EFFECTIVE STREAM AREA(ACRES) =     200.33
  TOTAL STREAM AREA(ACRES) =     200.33
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     304.13

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    32324.88   23.39    2.180  0.30( 0.29) 0.96    5830.9   13810.00
      1    32741.74   24.50    2.110  0.30( 0.29) 0.96    6134.2   13850.00
      1    36165.43   33.78    1.760  0.30( 0.29) 0.97    8620.6   10400.00
      1    36694.31   35.18    1.724  0.30( 0.29) 0.97    9176.1   13830.00
      1    38262.80   39.58    1.612  0.30( 0.29) 0.97   10854.2   20700.00
      1    41055.88   47.70    1.438  0.30( 0.29) 0.97   14352.2   10100.00
      1    44726.63   58.21    1.295  0.30( 0.29) 0.97   20000.6   20100.00
      1    46275.18   65.94    1.234  0.30( 0.29) 0.97   24329.7   31400.00
      1    47951.29   75.45    1.169  0.30( 0.29) 0.96   29535.7   13100.00
      1    49450.59   81.87    1.125  0.30( 0.29) 0.96   32640.4   11801.00
      1    51547.52   91.02    1.065  0.30( 0.29) 0.97   37682.2   11530.00
      1    52649.86   96.33    1.041  0.30( 0.29) 0.97   41330.8   13510.00
      1    53658.29  101.37    1.018  0.30( 0.29) 0.97   44682.0   13010.00
      1    54685.45  106.20    0.996  0.30( 0.29) 0.97   47930.5   11330.00
      1    55243.60  112.44    0.968  0.30( 0.29) 0.97   52360.8   11130.00
      1    54554.25  120.09    0.933  0.30( 0.29) 0.97   56351.1   12330.00
      1    53825.99  126.81    0.915  0.30( 0.29) 0.97   59694.1   12400.00
      1    52726.46  135.59    0.892  0.30( 0.29) 0.97   63061.5   12201.00
      1    51161.98  145.11    0.868  0.30( 0.29) 0.97   65517.1   12101.10
      1    50460.77  149.22    0.857  0.30( 0.29) 0.98   66367.9   10400.00
      1    48585.86  157.46    0.836  0.30( 0.29) 0.98   67680.0   12010.00
      1    47031.62  163.56    0.820  0.30( 0.29) 0.98   67996.5   10210.00
      1    42514.74  190.28    0.765  0.30( 0.29) 0.98   68728.6   10100.00
      2      304.13   27.75    1.957  0.30( 0.27) 0.90     200.3   13870.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    32615.12   23.39    2.180  0.30( 0.29) 0.96    5999.8   13810.00
      2    33034.63   24.50    2.110  0.30( 0.29) 0.96    6311.1   13850.00
      3    34242.88   27.75    1.957  0.30( 0.29) 0.96    7203.8   13870.00
      4    36434.13   33.78    1.760  0.30( 0.29) 0.96    8820.9   10400.00
      5    36956.57   35.18    1.724  0.30( 0.29) 0.96    9376.4   13830.00
      6    38504.75   39.58    1.612  0.30( 0.29) 0.97   11054.5   20700.00
```



```
      7    41266.45   47.70    1.438  0.30( 0.29) 0.97   14552.5   10100.00
      8    44911.39   58.21    1.295  0.30( 0.29) 0.97   20200.9   20100.00
      9    46448.95   65.94    1.234  0.30( 0.29) 0.96   24530.0   31400.00
     10    48113.40   75.45    1.169  0.30( 0.29) 0.96   29736.0   13100.00
     11    49604.83   81.87    1.125  0.30( 0.29) 0.96   32840.7   11801.00
     12    51690.95   91.02    1.065  0.30( 0.29) 0.96   37882.5   11530.00
     13    52788.92   96.33    1.041  0.30( 0.29) 0.97   41531.1   13510.00
     14    53793.21  101.37    1.018  0.30( 0.29) 0.97   44882.3   13010.00
     15    54816.39  106.20    0.996  0.30( 0.29) 0.97   48130.8   11330.00
     16    55369.39  112.44    0.968  0.30( 0.29) 0.97   52561.2   11130.00
     17    54673.77  120.09    0.933  0.30( 0.29) 0.97   56551.4   12330.00
     18    53942.37  126.81    0.915  0.30( 0.29) 0.97   59894.4   12400.00
     19    52838.72  135.59    0.892  0.30( 0.29) 0.97   63261.8   12201.00
     20    51269.78  145.11    0.868  0.30( 0.29) 0.97   65717.4   12101.10
     21    50566.65  149.22    0.857  0.30( 0.29) 0.97   66568.2   10400.00
     22    48687.87  157.46    0.836  0.30( 0.29) 0.98   67880.3   12010.00
     23    47130.78  163.56    0.820  0.30( 0.29) 0.98   68196.9   10210.00
     24    42604.08  190.28    0.765  0.30( 0.29) 0.98   68928.9   10100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   55369.39    Tc(MIN.) =   112.44
  EFFECTIVE AREA(ACRES) =   52561.16   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
  TOTAL AREA(ACRES) =    68928.9
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13880.00 =  134069.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    120.57  DOWNSTREAM(FEET) =    119.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1190.21   CHANNEL SLOPE =  0.0007
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  28.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  0.958
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -      117.69      0.30     0.724     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.724
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   55408.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.22
  AVERAGE FLOW DEPTH(FEET) =  28.23   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =  114.60
  SUBAREA AREA(ACRES) =   117.69       SUBAREA RUNOFF(CFS) =   78.44
  EFFECTIVE AREA(ACRES) =  52678.85     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69046.6         PEAK FLOW RATE(CFS) =   55369.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  28.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) = 28.22   FLOW VELOCITY(FEET/SEC.) =   9.22
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13910.00 =  135259.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13880.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  114.60
  RAINFALL INTENSITY(INCH/HR) =   0.96
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.97
  EFFECTIVE STREAM AREA(ACRES) =   52678.85
  TOTAL STREAM AREA(ACRES) =   69046.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   55369.39

****************************************************************************
  FLOW PROCESS FROM NODE  13889.00 TO NODE  13890.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   447.89
  ELEVATION DATA: UPSTREAM(FEET) =    564.89  DOWNSTREAM(FEET) =    421.92

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.976
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.950
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK               -        3.03      0.30     0.960     0    6.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.960
  SUBAREA RUNOFF(CFS) =     12.71
  TOTAL AREA(ACRES) =      3.03   PEAK FLOW RATE(CFS) =     12.71

****************************************************************************
  FLOW PROCESS FROM NODE  13890.00 TO NODE  13891.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    421.92  DOWNSTREAM(FEET) =    392.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   435.33   CHANNEL SLOPE =  0.0673
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.409
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        8.12      0.30     0.986     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
```



```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.43
  AVERAGE FLOW DEPTH(FEET) =   0.47   TRAVEL TIME(MIN.) =   1.34
  Tc(MIN.) =    8.31
  SUBAREA AREA(ACRES) =     8.12       SUBAREA RUNOFF(CFS) =   30.06
  EFFECTIVE AREA(ACRES) =     11.15     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.98
  TOTAL AREA(ACRES) =       11.1         PEAK FLOW RATE(CFS) =      41.30
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   6.26
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13891.00 =     883.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13891.00 TO NODE  13892.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    392.64  DOWNSTREAM(FEET) =    324.46
  CHANNEL LENGTH THRU SUBAREA(FEET) =   662.40   CHANNEL SLOPE =  0.1029
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.68
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.867
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -       12.50      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      61.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.24
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   1.34
  Tc(MIN.) =    9.65
  SUBAREA AREA(ACRES) =    12.50       SUBAREA RUNOFF(CFS) =   40.13
  EFFECTIVE AREA(ACRES) =     23.65     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       23.6         PEAK FLOW RATE(CFS) =      76.00
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   8.88
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13892.00 =    1545.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13892.00 TO NODE  13893.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    324.46  DOWNSTREAM(FEET) =    240.82
  CHANNEL LENGTH THRU SUBAREA(FEET) =   980.03   CHANNEL SLOPE =  0.0853
```

```
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.485
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       15.87      0.30     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      98.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.08
  AVERAGE FLOW DEPTH(FEET) =   0.92   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =   11.45
  SUBAREA AREA(ACRES) =    15.87       SUBAREA RUNOFF(CFS) =   45.49
  EFFECTIVE AREA(ACRES) =     39.52     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       39.5         PEAK FLOW RATE(CFS) =     113.35
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOW VELOCITY(FEET/SEC.) =   9.50
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13893.00 =    2525.65 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13893.00 TO NODE  13894.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    240.82  DOWNSTREAM(FEET) =    163.04
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1144.35   CHANNEL SLOPE =  0.0680
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.156
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       28.41      0.30     0.985     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.985
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     149.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.68
  AVERAGE FLOW DEPTH(FEET) =   1.24   TRAVEL TIME(MIN.) =   1.97
  Tc(MIN.) =   13.42
  SUBAREA AREA(ACRES) =    28.41       SUBAREA RUNOFF(CFS) =   73.15
  EFFECTIVE AREA(ACRES) =     67.93     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       67.9         PEAK FLOW RATE(CFS) =     174.82
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   1.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.36   FLOW VELOCITY(FEET/SEC.) =  10.15
```



```
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13894.00 =    3670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   163.04  DOWNSTREAM(FEET) =   119.70
  FLOW LENGTH(FEET) =  1899.01   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.39
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     174.82
  PIPE TRAVEL TIME(MIN.) =   1.72    Tc(MIN.) =   15.14
  LONGEST FLOWPATH FROM NODE  13889.00 TO NODE  13910.00 =    5569.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.14
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.879
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       11.69      0.30     0.634     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.634
  SUBAREA AREA(ACRES) =   11.69      SUBAREA RUNOFF(CFS) =   28.29
  EFFECTIVE AREA(ACRES) =     79.62   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.94
  TOTAL AREA(ACRES) =       79.6       PEAK FLOW RATE(CFS) =     186.13

****************************************************************************
  FLOW PROCESS FROM NODE  13894.00 TO NODE  13910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.14
  RAINFALL INTENSITY(INCH/HR) =   2.88
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.94
  EFFECTIVE STREAM AREA(ACRES) =      79.62
  TOTAL STREAM AREA(ACRES) =      79.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     186.13

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    32615.12   25.87    2.040  0.30( 0.29) 0.96    6117.5   13810.00
      1    33034.63   26.97    1.991  0.30( 0.29) 0.96    6428.8   13850.00
      1    34242.88   30.19    1.852  0.30( 0.29) 0.96    7321.5   13870.00
```

1	36434.13	36.19	1.699	0.30(0.29)	0.96	8938.6	10400.00
1	36956.57	37.58	1.663	0.30(0.29)	0.96	9494.1	13830.00
1	38504.75	41.95	1.560	0.30(0.29)	0.96	11172.2	20700.00
1	41266.45	50.03	1.389	0.30(0.29)	0.97	14670.2	10100.00
1	44911.39	60.49	1.271	0.30(0.29)	0.97	20318.6	20100.00
1	46448.95	68.20	1.218	0.30(0.29)	0.96	24647.7	31400.00
1	48113.40	77.69	1.154	0.30(0.29)	0.96	29853.7	13100.00
1	49604.83	84.08	1.110	0.30(0.29)	0.96	32958.4	11801.00
1	51690.95	93.21	1.055	0.30(0.29)	0.96	38000.2	11530.00
1	52788.92	98.51	1.031	0.30(0.29)	0.97	41648.8	13510.00
1	53793.21	103.54	1.008	0.30(0.29)	0.97	45000.0	13010.00
1	54816.39	108.36	0.986	0.30(0.29)	0.97	48248.5	11330.00
1	55369.39	114.60	0.958	0.30(0.29)	0.97	52678.9	11130.00
1	54673.77	122.25	0.927	0.30(0.29)	0.97	56669.1	12330.00
1	53942.37	128.98	0.910	0.30(0.29)	0.97	60012.1	12400.00
1	52838.72	137.77	0.887	0.30(0.29)	0.97	63379.5	12201.00
1	51269.78	147.31	0.862	0.30(0.29)	0.97	65835.1	12101.10
1	50566.65	151.42	0.851	0.30(0.29)	0.97	66685.9	10400.00
1	48687.87	159.68	0.830	0.30(0.29)	0.97	67998.0	12010.00
1	47130.78	165.81	0.814	0.30(0.29)	0.97	68314.5	10210.00
1	42604.08	192.58	0.763	0.30(0.29)	0.98	69046.6	10100.00
2	186.13	15.14	2.879	0.30(0.28)	0.94	79.6	13889.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28417.02	15.14	2.879	0.30(0.29)	0.96	3660.5	13889.00
2	32741.12	25.87	2.040	0.30(0.29)	0.96	6197.1	13810.00
3	33157.14	26.97	1.991	0.30(0.29)	0.96	6508.4	13850.00
4	34355.43	30.19	1.852	0.30(0.29)	0.96	7401.2	13870.00
5	36535.68	36.19	1.699	0.30(0.29)	0.96	9018.2	10400.00
6	37055.58	37.58	1.663	0.30(0.29)	0.96	9573.8	13830.00
7	38596.35	41.95	1.560	0.30(0.29)	0.96	11251.8	20700.00
8	41345.80	50.03	1.389	0.30(0.29)	0.97	14749.8	10100.00
9	44982.29	60.49	1.271	0.30(0.29)	0.97	20398.2	20100.00
10	46516.09	68.20	1.218	0.30(0.29)	0.96	24727.3	31400.00
11	48175.91	77.69	1.154	0.30(0.29)	0.96	29933.3	13100.00
12	49664.23	84.08	1.110	0.30(0.29)	0.96	33038.0	11801.00
13	51746.42	93.21	1.055	0.30(0.29)	0.96	38079.8	11530.00
14	52842.65	98.51	1.031	0.30(0.29)	0.97	41728.4	13510.00
15	53845.29	103.54	1.008	0.30(0.29)	0.97	45079.6	13010.00
16	54866.89	108.36	0.986	0.30(0.29)	0.97	48328.1	11330.00
17	55417.86	114.60	0.958	0.30(0.29)	0.97	52758.5	11130.00
18	54720.05	122.25	0.927	0.30(0.29)	0.97	56748.7	12330.00
19	53987.39	128.98	0.910	0.30(0.29)	0.97	60091.8	12400.00
20	52882.11	137.77	0.887	0.30(0.29)	0.97	63459.1	12201.00
21	51311.39	147.31	0.862	0.30(0.29)	0.97	65914.8	12101.10
22	50607.49	151.42	0.851	0.30(0.29)	0.97	66765.5	10400.00
23	48727.17	159.68	0.830	0.30(0.29)	0.97	68077.6	12010.00
24	47168.94	165.81	0.814	0.30(0.29)	0.97	68394.2	10210.00
25	42638.57	192.58	0.763	0.30(0.29)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 55417.86 Tc(MIN.) = 114.60
EFFECTIVE AREA(ACRES) = 52758.47 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 69126.2
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 69126.2 TC(MIN.) = 114.60
EFFECTIVE AREA(ACRES) = 52758.47 AREA-AVERAGED Fm(INCH/HR)= 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.971
PEAK FLOW RATE(CFS) = 55417.86

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28417.02	15.14	2.879	0.30(0.29)	0.96	3660.5	13889.00
2	32741.12	25.87	2.040	0.30(0.29)	0.96	6197.1	13810.00
3	33157.14	26.97	1.991	0.30(0.29)	0.96	6508.4	13850.00
4	34355.43	30.19	1.852	0.30(0.29)	0.96	7401.2	13870.00
5	36535.68	36.19	1.699	0.30(0.29)	0.96	9018.2	10400.00
6	37055.58	37.58	1.663	0.30(0.29)	0.96	9573.8	13830.00
7	38596.35	41.95	1.560	0.30(0.29)	0.96	11251.8	20700.00
8	41345.80	50.03	1.389	0.30(0.29)	0.97	14749.8	10100.00
9	44982.29	60.49	1.271	0.30(0.29)	0.97	20398.2	20100.00
10	46516.09	68.20	1.218	0.30(0.29)	0.96	24727.3	31400.00
11	48175.91	77.69	1.154	0.30(0.29)	0.96	29933.3	13100.00
12	49664.23	84.08	1.110	0.30(0.29)	0.96	33038.0	11801.00
13	51746.42	93.21	1.055	0.30(0.29)	0.96	38079.8	11530.00
14	52842.65	98.51	1.031	0.30(0.29)	0.97	41728.4	13510.00
15	53845.29	103.54	1.008	0.30(0.29)	0.97	45079.6	13010.00
16	54866.89	108.36	0.986	0.30(0.29)	0.97	48328.1	11330.00
17	55417.86	114.60	0.958	0.30(0.29)	0.97	52758.5	11130.00
18	54720.05	122.25	0.927	0.30(0.29)	0.97	56748.7	12330.00
19	53987.39	128.98	0.910	0.30(0.29)	0.97	60091.8	12400.00
20	52882.11	137.77	0.887	0.30(0.29)	0.97	63459.1	12201.00
21	51311.39	147.31	0.862	0.30(0.29)	0.97	65914.8	12101.10
22	50607.49	151.42	0.851	0.30(0.29)	0.97	66765.5	10400.00
23	48727.17	159.68	0.830	0.30(0.29)	0.97	68077.6	12010.00
24	47168.94	165.81	0.814	0.30(0.29)	0.97	68394.2	10210.00
25	42638.57	192.58	0.763	0.30(0.29)	0.98	69126.2	10100.00

==========

END OF RATIONAL METHOD ANALYSIS

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:

                        Michael Baker International
                      5 Hutton Centre Drive, Suite 500
                              Santa Ana, CA
                                  92707

------------------------------------------------------------------------
  FILE NAME: S39.DAT
  TIME/DATE OF STUDY: 11:06 07/16/2018
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED TABLED RAINFALL USED*
  NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14
   1)    5.00;  5.744
   2)   10.00;  3.724
   3)   15.00;  2.891
   4)   20.00;  2.392
   5)   25.00;  2.077
   6)   30.00;  1.856
   7)   40.00;  1.601
   8)   50.00;  1.389
   9)   60.00;  1.273
  10)   90.00;  1.070
  11)  120.00;  0.932
  12)  180.00;  0.777
  13)  360.00;  0.571
  14) 1440.00;  0.248
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```



```
************************************************************************
  FLOW PROCESS FROM NODE  13900.00 TO NODE  13901.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   600.65
  ELEVATION DATA: UPSTREAM(FEET) =    442.40  DOWNSTREAM(FEET) =    385.16

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.859
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.581
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  AGRICULTURAL POOR COVER
  "FALLOW"                  -        4.00      0.30     1.000      0   10.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.81
  TOTAL AREA(ACRES) =      4.00   PEAK FLOW RATE(CFS) =     11.81

************************************************************************
  FLOW PROCESS FROM NODE  13901.00 TO NODE  13902.00 IS CODE =  56
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    385.16  DOWNSTREAM(FEET) =    288.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   647.42   CHANNEL SLOPE =  0.1497
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.34
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.307
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED              -        8.47      0.30     1.000      -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.56
  AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   1.64
  Tc(MIN.) =   12.50
  SUBAREA AREA(ACRES) =     8.47       SUBAREA RUNOFF(CFS) =   22.92
  EFFECTIVE AREA(ACRES) =     12.47     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       12.5          PEAK FLOW RATE(CFS) =      33.75
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =   7.51
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13902.00 =    1248.07 FEET.

************************************************************************
  FLOW PROCESS FROM NODE  13902.00 TO NODE  13903.00 IS CODE =  56
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    288.21  DOWNSTREAM(FEET) =    184.89
  CHANNEL LENGTH THRU SUBAREA(FEET) =   669.27   CHANNEL SLOPE =  0.1544
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.113
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       23.85      0.30     0.982     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.982
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      64.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.56
  AVERAGE FLOW DEPTH(FEET) =   0.60   TRAVEL TIME(MIN.) =   1.17
  Tc(MIN.) =   13.67
  SUBAREA AREA(ACRES) =    23.85       SUBAREA RUNOFF(CFS) =   60.49
  EFFECTIVE AREA(ACRES) =     36.32     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.99
  TOTAL AREA(ACRES) =       36.3         PEAK FLOW RATE(CFS) =      92.06
  GIVEN CHANNEL BASE(FEET) =   10.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   2.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   0.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =  10.79
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13903.00 =    1917.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   184.89  DOWNSTREAM(FEET) =   155.08
  FLOW LENGTH(FEET) =   876.66   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.29
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      92.06
  PIPE TRAVEL TIME(MIN.) =   0.80    Tc(MIN.) =   14.47
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13904.00 =    2794.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13903.00 TO NODE  13904.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.980
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  USER-DEFINED               -       21.29      0.30     0.996     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.996
  SUBAREA AREA(ACRES) =   21.29      SUBAREA RUNOFF(CFS) =   51.37
  EFFECTIVE AREA(ACRES) =     57.61   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =       57.6       PEAK FLOW RATE(CFS) =     139.07

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.08  DOWNSTREAM(FEET) =   118.00
  FLOW LENGTH(FEET) =  1961.38   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.12
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     139.07
  PIPE TRAVEL TIME(MIN.) =   2.03    Tc(MIN.) =   16.50
  LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.742
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.53      0.30     0.649     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.649
  SUBAREA AREA(ACRES) =   43.53      SUBAREA RUNOFF(CFS) =   99.78
  EFFECTIVE AREA(ACRES) =    101.14   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =      101.1       PEAK FLOW RATE(CFS) =     226.52

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: S38.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    28417.02   15.14  0.30( 0.29) 0.96    3660.5   13889.00
      2    34355.43   30.19  0.30( 0.29) 0.96    7401.2   13870.00
```

```
      3    38596.35   41.95  0.30( 0.29) 0.96   11251.8   20700.00
      4    41345.80   50.03  0.30( 0.29) 0.97   14749.8   10100.00
      5    44982.29   60.49  0.30( 0.29) 0.97   20398.2   20100.00
      6    46516.09   68.20  0.30( 0.29) 0.96   24727.3   31400.00
      7    48175.91   77.69  0.30( 0.29) 0.96   29933.3   13100.00
      8    49664.23   84.08  0.30( 0.29) 0.96   33038.0   11801.00
      9    51746.42   93.21  0.30( 0.29) 0.96   38079.8   11530.00
     10    52842.65   98.51  0.30( 0.29) 0.97   41728.4   13510.00
     11    53845.29  103.54  0.30( 0.29) 0.97   45079.6   13010.00
     12    54866.89  108.36  0.30( 0.29) 0.97   48328.1   11330.00
     13    55417.86  114.60  0.30( 0.29) 0.97   52758.5   11130.00
     14    54720.05  122.25  0.30( 0.29) 0.97   56748.7   12330.00
     15    53987.39  128.98  0.30( 0.29) 0.97   60091.8   12400.00
     16    52882.11  137.77  0.30( 0.29) 0.97   63459.1   12201.00
     17    51311.39  147.31  0.30( 0.29) 0.97   65914.8   12101.10
     18    48727.17  159.68  0.30( 0.29) 0.97   68077.6   12010.00
     19    47168.94  165.81  0.30( 0.29) 0.97   68394.2   10210.00
     20    42638.57  192.58  0.30( 0.29) 0.98   69126.2   10100.00
   TOTAL AREA(ACRES) =    69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13910.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.)  (INCH/HR)          (ACRES)    NODE
      1    28417.02   15.14  0.30( 0.29) 0.96    3660.5   13889.00
      2    34355.43   30.19  0.30( 0.29) 0.96    7401.2   13870.00
      3    38596.35   41.95  0.30( 0.29) 0.96   11251.8   20700.00
      4    41345.80   50.03  0.30( 0.29) 0.97   14749.8   10100.00
      5    44982.29   60.49  0.30( 0.29) 0.97   20398.2   20100.00
      6    46516.09   68.20  0.30( 0.29) 0.96   24727.3   31400.00
      7    48175.91   77.69  0.30( 0.29) 0.96   29933.3   13100.00
      8    49664.23   84.08  0.30( 0.29) 0.96   33038.0   11801.00
      9    51746.42   93.21  0.30( 0.29) 0.96   38079.8   11530.00
     10    52842.65   98.51  0.30( 0.29) 0.97   41728.4   13510.00
     11    53845.29  103.54  0.30( 0.29) 0.97   45079.6   13010.00
     12    54866.89  108.36  0.30( 0.29) 0.97   48328.1   11330.00
     13    55417.86  114.60  0.30( 0.29) 0.97   52758.5   11130.00
     14    54720.05  122.25  0.30( 0.29) 0.97   56748.7   12330.00
     15    53987.39  128.98  0.30( 0.29) 0.97   60091.8   12400.00
     16    52882.11  137.77  0.30( 0.29) 0.97   63459.1   12201.00
     17    51311.39  147.31  0.30( 0.29) 0.97   65914.8   12101.10
     18    48727.17  159.68  0.30( 0.29) 0.97   68077.6   12010.00
     19    47168.94  165.81  0.30( 0.29) 0.97   68394.2   10210.00
     20    42638.57  192.58  0.30( 0.29) 0.98   69126.2   10100.00
   TOTAL AREA(ACRES) =     69126.2

****************************************************************************
  FLOW PROCESS FROM NODE  13910.00 TO NODE  13920.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    119.70  DOWNSTREAM(FEET) =    118.00
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  CHANNEL LENGTH THRU SUBAREA(FEET) =  1376.26   CHANNEL SLOPE =  0.0012
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  24.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  0.947
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       96.09      0.30     0.535     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.535
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   55451.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.17
  AVERAGE FLOW DEPTH(FEET) =  24.87   TRAVEL TIME(MIN.) =   2.05
  Tc(MIN.) =  116.65
  SUBAREA AREA(ACRES) =    96.09       SUBAREA RUNOFF(CFS) =   68.06
  EFFECTIVE AREA(ACRES) =  52854.56     AREA-AVERAGED Fm(INCH/HR) =   0.29
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
  TOTAL AREA(ACRES) =    69222.3         PEAK FLOW RATE(CFS) =   55417.86
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
  *ESTIMATED CHANNEL HEIGHT(FEET) =  24.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) = 24.87   FLOW VELOCITY(FEET/SEC.) =  11.17
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13904.00 TO NODE  13920.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1    28417.02   17.60    2.631  0.30( 0.28) 0.94    3756.6   13889.00
      2    34355.43   32.53    1.791  0.30( 0.29) 0.95    7497.2   13870.00
      3    38596.35   44.21    1.512  0.30( 0.29) 0.96   11347.9   20700.00
      4    41345.80   52.25    1.363  0.30( 0.29) 0.96   14845.9   10100.00
      5    44982.29   62.66    1.255  0.30( 0.29) 0.96   20494.3   20100.00
      6    46516.09   70.35    1.203  0.30( 0.29) 0.96   24823.4   31400.00
      7    48175.91   79.82    1.139  0.30( 0.29) 0.96   30029.4   13100.00
      8    49664.23   86.20    1.096  0.30( 0.29) 0.96   33134.1   11801.00
      9    51746.42   95.31    1.046  0.30( 0.29) 0.96   38175.9   11530.00
     10    52842.65  100.59    1.021  0.30( 0.29) 0.96   41824.5   13510.00
     11    53845.29  105.60    0.998  0.30( 0.29) 0.97   45175.7   13010.00
     12    54866.89  110.41    0.976  0.30( 0.29) 0.97   48424.2   11330.00
     13    55417.86  116.65    0.947  0.30( 0.29) 0.97   52854.6   11130.00
     14    54720.05  124.31    0.921  0.30( 0.29) 0.97   56844.8   12330.00
     15    53987.39  131.04    0.903  0.30( 0.29) 0.97   60187.9   12400.00
     16    52882.11  139.85    0.881  0.30( 0.29) 0.97   63555.2   12201.00
     17    51311.39  149.40    0.856  0.30( 0.29) 0.97   66010.8   12101.10
     18    48727.17  161.81    0.824  0.30( 0.29) 0.97   68173.7   12010.00
     19    47168.94  167.95    0.808  0.30( 0.29) 0.97   68490.3   10210.00
     20    42638.57  194.79    0.760  0.30( 0.29) 0.97   69222.3   10100.00
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.
```

```
 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      226.52   16.50    2.742  0.30( 0.25) 0.84     101.1   13900.00
 LONGEST FLOWPATH FROM NODE  13900.00 TO NODE  13920.00 =    4755.38 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1    28109.75   16.50    2.742  0.30( 0.28) 0.94    3621.6   13900.00
     2    28633.49   17.60    2.631  0.30( 0.28) 0.94    3857.8   13889.00
     3    34495.46   32.53    1.791  0.30( 0.29) 0.95    7598.4   13870.00
     4    38710.91   44.21    1.512  0.30( 0.29) 0.96   11449.0   20700.00
     5    41446.82   52.25    1.363  0.30( 0.29) 0.96   14947.0   10100.00
     6    45073.49   62.66    1.255  0.30( 0.29) 0.96   20595.5   20100.00
     7    46602.55   70.35    1.203  0.30( 0.29) 0.96   24924.5   31400.00
     8    48256.55   79.82    1.139  0.30( 0.29) 0.96   30130.6   13100.00
     9    49740.93   86.20    1.096  0.30( 0.29) 0.96   33235.3   11801.00
    10    51818.55   95.31    1.046  0.30( 0.29) 0.96   38277.1   11530.00
    11    52912.58  100.59    1.021  0.30( 0.29) 0.96   41925.6   13510.00
    12    53913.12  105.60    0.998  0.30( 0.29) 0.97   45276.8   13010.00
    13    54932.71  110.41    0.976  0.30( 0.29) 0.97   48525.3   11330.00
    14    55481.06  116.65    0.947  0.30( 0.29) 0.97   52955.7   11130.00
    15    54780.84  124.31    0.921  0.30( 0.29) 0.97   56945.9   12330.00
    16    54046.60  131.04    0.903  0.30( 0.29) 0.97   60289.0   12400.00
    17    52939.23  139.85    0.881  0.30( 0.29) 0.97   63656.3   12201.00
    18    51366.27  149.40    0.856  0.30( 0.29) 0.97   66112.0   12101.10
    19    48779.14  161.81    0.824  0.30( 0.29) 0.97   68274.8   12010.00
    20    47219.46  167.95    0.808  0.30( 0.29) 0.97   68591.4   10210.00
    21    42684.72  194.79    0.760  0.30( 0.29) 0.97   69323.4   10100.00
   TOTAL AREA(ACRES) =     69323.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    55481.06  Tc(MIN.) =  116.649
 EFFECTIVE AREA(ACRES) =  52955.70  AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.97
 TOTAL AREA(ACRES) =    69323.4
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13920.00 =  136635.95 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13920.00 TO NODE  13921.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    118.00  DOWNSTREAM(FEET) =    115.28
 CHANNEL LENGTH THRU SUBAREA(FEET) =   335.44   CHANNEL SLOPE =  0.0081
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  15.51
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  0.946
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -      134.30      0.30     0.658     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.658
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 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   55526.32
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  22.10
 AVERAGE FLOW DEPTH(FEET) =  15.51   TRAVEL TIME(MIN.) =   0.25
 Tc(MIN.) =  116.90
 SUBAREA AREA(ACRES) =   134.30       SUBAREA RUNOFF(CFS) =   90.52
 EFFECTIVE AREA(ACRES) =  53090.00     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =    69457.7         PEAK FLOW RATE(CFS) =   55481.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  15.50

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 15.50   FLOW VELOCITY(FEET/SEC.) =  22.10
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  13921.00 =  136971.39 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13921.00 TO NODE  14010.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    115.28  DOWNSTREAM(FEET) =    100.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1396.08   CHANNEL SLOPE =  0.0109
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  14.35
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  0.942
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       96.27      0.30     0.723     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.723
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   55512.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  24.60
 AVERAGE FLOW DEPTH(FEET) =  14.34   TRAVEL TIME(MIN.) =   0.95
 Tc(MIN.) =  117.85
 SUBAREA AREA(ACRES) =    96.27       SUBAREA RUNOFF(CFS) =   62.82
 EFFECTIVE AREA(ACRES) =  53186.27     AREA-AVERAGED Fm(INCH/HR) =   0.29
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.97
 TOTAL AREA(ACRES) =    69554.0         PEAK FLOW RATE(CFS) =   55481.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 GIVEN CHANNEL BASE(FEET) =  100.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   4.000   MANNING'S FACTOR = 0.030
 *ESTIMATED CHANNEL HEIGHT(FEET) =  14.34

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 14.34   FLOW VELOCITY(FEET/SEC.) =  24.59
 LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  14010.00 =  138367.47 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    69554.0  TC(MIN.) =    117.85
 EFFECTIVE AREA(ACRES) =  53186.27  AREA-AVERAGED Fm(INCH/HR)=  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.969
 PEAK FLOW RATE(CFS)   =   55481.06
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** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28109.75	17.96	2.596	0.30(0.28)	0.93	3852.1	13900.00
2	28633.49	19.06	2.486	0.30(0.28)	0.93	4088.3	13889.00
3	34495.46	33.91	1.756	0.30(0.28)	0.94	7829.0	13870.00
4	38710.91	45.54	1.483	0.30(0.29)	0.95	11679.6	20700.00
5	41446.82	53.56	1.348	0.30(0.29)	0.96	15177.6	10100.00
6	45073.49	63.93	1.246	0.30(0.29)	0.96	20826.0	20100.00
7	46602.55	71.61	1.194	0.30(0.29)	0.96	25155.1	31400.00
8	48256.55	81.07	1.130	0.30(0.29)	0.96	30361.1	13100.00
9	49740.93	87.44	1.087	0.30(0.29)	0.96	33465.8	11801.00
10	51818.55	96.53	1.040	0.30(0.29)	0.96	38507.6	11530.00
11	52912.58	101.80	1.016	0.30(0.29)	0.96	42156.2	13510.00
12	53913.12	106.81	0.993	0.30(0.29)	0.96	45507.4	13010.00
13	54932.71	111.62	0.971	0.30(0.29)	0.97	48755.9	11330.00
14	55481.06	117.85	0.942	0.30(0.29)	0.97	53186.3	11130.00
15	54780.84	125.51	0.918	0.30(0.29)	0.97	57176.5	12330.00
16	54046.60	132.25	0.900	0.30(0.29)	0.97	60519.6	12400.00
17	52939.23	141.07	0.878	0.30(0.29)	0.97	63886.9	12201.00
18	51366.27	150.63	0.853	0.30(0.29)	0.97	66342.6	12101.10
19	48779.14	163.05	0.821	0.30(0.29)	0.97	68505.4	12010.00
20	47219.46	169.21	0.805	0.30(0.29)	0.97	68822.0	10210.00
21	42684.72	196.08	0.759	0.30(0.29)	0.97	69554.0	10100.00

END OF RATIONAL METHOD ANALYSIS